

Emulex Solaris Drivers: No-reboot Operation

Audience

This document is intended for system administrators with prior knowledge of Solaris SCSI services and the Emulex Solaris driver. It supplements the Solaris manuals available online at <http://www.emulex.com/ts/docfc/solframe.htm>.

Overview

The latest Emulex 6.x drivers allow an end user to complete the following without reboot:

- Hot swap adapters
- Discover newly provisioned Targets and LUNs
- Remove 'ghost devices'
- Make persistent binding changes
- Make other driver configuration changes
- Turn on the log capability (log_verbose)
- Update adapter firmware

Earlier 5.x drivers allow some of these capabilities. The following instructions identify each driver generation's capabilities. Solaris 10 capabilities verified based on available Beta versions.

Hot swapping adapters

Emulex adapters support Sun Dynamic Reconfiguration (DR), enabling 'hot swap' operations. Optimal DR quality is achieved by combining the latest driver, firmware and OpenBoot versions. Refer to Sun documentation to verify how DR operates on your server (GUI or command line-driven, slot-level or boat-level).

Discovering new Targets and LUNs

Solaris 9 and 10

These steps will allow new Targets and LUNs to be seen even if the unassigned Targets and LUNs weren't in sd.conf since the last reboot. This applies to 5.x as well as 6.x drivers.

- Edit sd.conf (make sure the new targets and LUNs are identified in this configuration file)
- Run "update_drv -f sd" (note the space between -f, for "force", and sd, for the conf file to be re-read). See man pages for more information on this command. Newly provisioned targets and LUNs should now be seen.
- If LUNs are not available, run devfsadm at command prompt. See the Solaris man pages for more information on this command.

Solaris 8—Unassigned Targets and LUNs provisioned in sd.conf at last reboot:

- If the Automap parameter of lpfc.conf was turned ON at last reboot, you can use the Solaris devfsadm command
- If Automap was turned OFF: with the Solaris 6.x driver the user can specify the SCSI ID through HBAnyware. These bindings take effect immediately without driver unload/reload.
- Note that with the Solaris 6.x driver, unassigned targets no longer use up memory space.

Solaris 2.6, 7 or 8 - Unassigned Targets/LUNs not provisioned in sd.conf:

Do you use sd as your boot driver?

Your first step is to check whether the boot driver is under control of sd.conf. This varies according to server type and your own configuration. To figure out the boot device, you can use a couple of commands:

mount (find the root disk [/] for use in the next command)

ls -l [root disk] (e.g. ls -l /dev/dsk/c0t0d0s0).

Then look to see if /sd is part of the device path. If it is part of the device path, and you are not running Solaris 9 or 10, and have not pre-provisioned targets and LUNs, then the only solution is to reboot.

Unloading sd-attached applications, then unloading/reloading the sd driver

In order to unload the sd driver all other drivers and applications attached to it need to be unloaded or halted. The automap parameter in lpfc.conf must have been turned on (value=1) at the last reboot

- Unmount file systems attached to sd driver (i.e. "# umount /mnt" or "umountall")
- Stop vold daemon (# /etc/rc2.d/S92volmgt stop)
- Identify module ID of sd driver and unload:

```
# modinfo | grep sd
```

In case of SunFire V880 displays:

```
19 101efd55 10a60 118 1 ssd
```

```
(SCSI SSA/FCAL Disk Driver 1.147)
```

```
138 78148000 183d0 32 1 sd (SCSI Disk Driver 1.359)
```

```
# modunload -i 138 (module ID from the above message)
```

- Edit /kernel/drv/sd.conf to add or remove LUNs and/or targets
- Run commands to discover new LUNs and/or targets
devfsadm (this will automatically load the sd driver, scan for new devices, and create necessary /dev/dsk and /dev/rdisk links.
If the devfsadm command is not recognized:
drvconfig
disks
- Restart vold daemon
(# /etc/rc2.d/S92volmgt start)
- Mount file systems
(i.e. "# mount /mnt" or "# mountall")

Removing ghost devices

Ghost devices are targets that have been disconnected since the last reboot, but remain in the Solaris sd configuration. While the presence of these devices does not create any runtime issues, they slow down certain actions and also confuse customers.

The procedure for removing ghost devices is identical to the one used for discovering targets and LUNs. This procedure will work the same for the 5.x and 6.x drivers.

Persistent binding and parameter changes

With the 6.x driver (all Solaris versions):

The Solaris 6.00 driver introduces the possibility to assign bindings and change parameters through the graphical user interface of HBAnyware™ 2.0. These binding and parameter changes take effect immediately without requiring a driver unload/reload. This capability is independent of the version of Solaris (2.6 or later).

With earlier drivers and Solaris 9 or 10:

Typically, the lpfc driver reads the configuration parameters from lpfc.conf, during driver startup. Once the configuration parameters are read, the lpfc driver does not re-read the driver parameters. This feature is native to the Solaris operating system. However on Solaris release 9 and 10, the user can force the lpfc driver to re-read the configuration file lpfc.conf using the system command update_drv. Note that this command does not change the parameters for the lpfc instances that are already active in the system. The changes will be applicable to any new lpfc instances that get attached later on.

To modify parameters for a controller instance that is already active, perform the following steps.

- Login as root or su to root
- Run cfgadm and note down the <Ap_Id> corresponding to the lpfc driver instance
- Unconfigure the lpfc driver instance corresponding to <Ap_Id>
- Edit the controller-specific parameters in the file /kernel/drv/lpfc.conf
- Run update_drv -f lpfc to force the Solaris system to re-read lpfc.conf
- Run cfgadm and configure the lpfc driver instance back

To modify parameters for a controller that is yet to be added, perform the following steps.

- Login as root or su to root
- Run cfgadm and configure the new lpfc driver instance
- Note down the lpfc instance. The lpfc driver instance is printed in the driver sign-on messages
- Run cfgadm and unconfigure the new lpfc driver instance
- Edit the controller-specific parameters in the file /kernel/drv/lpfc.conf
- Run update_drv -f lpfc to force the Solaris system to re-read lpfc.conf
- Run cfgadm and configure the new lpfc driver instance

Turning on Log-verbose

The Solaris 6.x driver introduces the possibility to turn on/off log_verbose through the graphical user interface of HBAnyware 2.0. This dynamic, selective logging capability, independent of the version of Solaris (2.6 or later), is among your best tools to identify any SAN-related issues.

No-reboot firmware updates

Emulex is the only vendor providing dynamic adapter firmware update during operation, and without stopping I/O traffic, through the use of HBAnyware (either HBAnyware 1.0 with the Solaris 5.01 or 5.02 drivers, or HBAnyware 2.0 with the Solaris 6.00/6.01 drivers).

For a general overview of system wide Quality of Service as it relates to the role of no-reboot drivers, please see the Emulex whitepaper entitled: Maximizing Solaris Quality of Service - The role of Fibre Channel HBAs.

(<http://www.emulex.com/products/white/index.html>)