

HP Smart Array Controller Driver for Solaris 10 User Guide



January 2007 (Third Edition)

©Copyright 2007 Hewlett-Packard Development Company, L.P.

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the U.S. and other countries.

Sun and Solaris are registered trademarks of Sun Microsystems, Inc.

January 2007 (Third Edition)

Contents

Introduction	5
Package Format and Contents	5
Package Format	5
Package Contents	5
Functionality.....	6
Package Installation and Configuration	7
System Requirements	7
Hardware Requirements	7
Software Requirements	8
Package Preparation.....	8
Unpacking the Distribution	8
Creating the DU Diskette	10
Creating the DU CD-ROM	10
Package Installation	11
Applying the DU During OS Installation	11
Installing the Driver on an Existing Installation	14
Installing the Driver Into a GRUB-based Miniroot.....	14
Installing the Driver Using JumpStart.....	16
Loading the Driver in Failsafe Mode.....	18
Configuration.....	18
Useful References	19
Package Maintenance	21
Package Removal.....	21
Package Upgrade	22

Introduction

This document provides details on applying the HP Third Generation Array Controllers Driver package to a Solaris 10 system during operating system installation time or to an existing Solaris 10 installation.

This revision of this document applies to driver version 1.60 and beyond.

Package Format and Contents

Package Format

The CPQary3 package is distributed in a compressed tar file, which can be extracted using the *gunzip(1)* and *tar(1)* utilities on a system running Solaris 10, or using a variety of other operating systems and/or tools.

Multiple images of the CPQary3 package are provided for convenience, and all images supply the same driver. The tar file contains the package in the following forms:

- 3.5" 1.44MB floppy disk image
- CD-ROM ISO image
- Solaris package image
- DU-style directory image

Package Contents

The CPQary3 package contains:

- HP Third Generation Smart Array Controller Driver (*cpqary3(7D)*) for Solaris 10 (for x86 platforms).
- Supporting documentation.

Functionality

cpqary3(7D) is a bootable device driver for Solaris 10, enabling the HP Smart Array family of disk controllers to be used with Solaris. The CPQary3 Driver Update (DU) diskette can be supplied to Solaris at installation time, allowing Solaris to be installed onto disk volumes attached to and configured by a Smart Array controller.

Package Installation and Configuration

System Requirements

This section describes the requirements of the system to which the CPQary3 package will be applied.

Hardware Requirements

- The server that will use the driver must be a supported HP ProLiant server and must have a supported embedded or add-on HP Smart Array controller. A list of controllers and other storage hardware supported by the driver is available in the `RELEASENOTES.CPQary3` file included in the distribution.
- *To install Solaris by supplying the driver on a floppy diskette*, the following are required:
 - A spare 3.5" 1.44MB floppy diskette.
 - An existing system that can be used to create the CPQary3 DU diskette.
 - The target server must have a *legacy* 3.5" 1.44MB floppy drive.
- *To install Solaris by supplying the driver on a CD-ROM* (Solaris 10 1/06 and beyond), the following are required:
 - Blank CD media.
 - An existing system that can be used to create the CPQary3 DU CD.
 - The target server must have a CD-ROM drive.
- *To install Solaris by supplying the driver via HP iLO virtual media* (Solaris 10 1/06 and beyond), a supported iLO client with access to the target server's iLO port is required.
- *To apply the DU diskette to a PXE server using the HP PXE Installation Utility* (Solaris 10 3/05 only), the PXE server must have a 3.5" 1.44MB floppy drive.

Note that during a network-based installation, the DU, and thus a floppy drive or CD-ROM drive, is *not* needed if the DU has previously been applied to the net-install image on the install server.

Software Requirements

- Solaris 10 operating system (for x86 platforms).

Package Preparation

NOTE: In the procedures that follow, *x.yy* is the version number of the package. It should be substituted with the appropriate version when executing the listed commands.

Unpacking the Distribution

The Smart Array driver is distributed as a gzip-compressed tar file which must be unpacked before use. The instructions below can be used on Solaris and other similar operating systems for which the *tar* and *gzip* tools are available.

NOTE: You must agree to the terms of the enclosed license in order to install and use the CPQary3 package and its components.

1. Download the CPQary3 distribution compressed tar file to a temporary local directory, such as `/var/tmp`. The name of the tar file has the form `CPQary3-x.yy-solaris10.i386.tar.gz`.
2. Uncompress and un-tar the compressed tar file to extract the CPQary3 package:

```
$ cd /var/tmp
$ gunzip CPQary3-x.yy-solaris10-i386.tar.gz
$ tar xvf CPQary3-x.yy-solaris10-i386.tar
```

3. Review the license and release notes included in the distribution:


```
$ cd CPQary3-x.yy-solaris10-i386
$ more LICENSE.CPQary3
$ more RELEASENOTES.CPQary3
```

You must agree to the terms of the license in order to install and use the CPQary3 package and its components.

The distribution contains the following components:

- `README.CPQary3`
Text file containing brief documentation for the distribution.
- `LICENSE.CPQary3`
Text file containing the end-user license which governs use of the distribution and its contents.
- `RELEASENOTES.CPQary3`
Text file containing the release notes for the distribution.
- `CPQary3.144`
3.5" 1.44MB floppy diskette image for the driver (DU floppy).
- `CPQary3.iso`
CD-ROM ISO image for the driver (DU CD-ROM).
- `CPQary3.pkg/`
Solaris package for the driver (directory format).
- `DU/`
DU-format directory image of the driver.
- `tools/fdwrite.exe`
A tool that can be used to copy the DU floppy image to a diskette using Microsoft Windows.

Creating the DU Diskette

The procedure below is used to create the Driver Update diskette. A DU diskette is necessary to use the driver at OS installation time (eg. to install Solaris to disk volumes attached to a Smart Array controller) or to apply the driver to a net-install image using the HP PXE Installation Utility.

1. If necessary, unpack the distribution as described above under **Unpacking the Distribution**.
2. *To create a Solaris 10 installation DU (floppy) for the driver under Solaris or other similar operating system, use `dd(1)` to copy the floppy image to a diskette:*

WARNING: All existing data on the target floppy diskette will be destroyed!

```
$ pwd
/var/tmp/CPQary3-x.yy-solaris10.i386
$ dd if=CPQary3.144 of=path-to-media
```

To create a Solaris 10 installation DU (floppy) for the driver under Microsoft Windows, the `fdwrite.exe` tool, which is included in the distribution, can be used:

WARNING: All existing data on the target floppy diskette will be destroyed!

- (a) Open a command prompt window: *Start* → *Run* → `cmd`
- (b) Copy the floppy image to diskette:

```
C:\...>cd ...\\CPQary3-x.yy-solaris10.i386
C:\...>tools\\fdwrite CPQary3.144 a:
```

Creating the DU CD-ROM

With Solaris 10 1/06 and beyond, driver updates may be supplied using CD-ROMs instead of floppy diskettes. Use of such a CD may be required if the target system does not have a legacy floppy drive. For convenience, a CD-ROM ISO image of the driver update is included in the distribution.

1. If necessary, unpack the distribution as described above under **Unpacking the Distribution**.
2. Using appropriate CD writing software and equipment, create a CD using the `CPQary3.iso` ISO image that is included in the distribution.

Package Installation

Applying the DU During OS Installation

One of following sets of procedures should be followed in order to apply the CPQary3 DU during installation of Solaris 10. The DU must be supplied during OS installation if the OS is being installed on disk volumes attached to a Smart Array controller.

Solaris 10 1/06 and Beyond With Solaris 10 1/06 and beyond, the DU may be supplied on a floppy diskette (using a *legacy* floppy drive), a CD-ROM (USB or other), or via HP iLO virtual media (using the CD-ROM ISO image).

1. If necessary, create a Driver Update (DU) diskette or CD-ROM using the procedures described above in **Creating the DU Diskette** or **Creating the DU CD-ROM**.
2. Boot the Solaris Installation to the following (or similar) menu:
 1. Solaris Interactive (default)
 2. Custom JumpStart
 3. Solaris Interactive Text (Desktop session)
 4. Solaris Interactive Text (Console session)
 5. Apply driver updates
 6. Single user shell

Enter the number of your choice.
3. Select “Apply driver updates” (option 5 in the menu above).

4. At the following prompt:

```
Insert media and enter media type:
Floppy [f], CD/DVD [c] or End [e]
```

do one of the following:

- (a) Insert the DU floppy, and choose 'f',
- (b) Insert the DU CD-ROM, and choose 'c', or
- (c) *If using virtual media*, disconnect the Solaris installation media (if necessary), connect the CPQary3.iso ISO image file included in the distribution, and choose 'c'.

Solaris will extract the driver, and the following (or similar) messages will indicate success:

```
extracting software on cd
installing driver update in the miniroot
```

5. Following driver application, Solaris will return to the following prompt:

```
Insert media and enter media type:
Floppy [f], CD/DVD [c] or End [e]
```

Choose 'e'. Solaris will prompt for re-insertion of the Solaris media; complete this step and proceed with the installation. *If using virtual media*, disconnect the driver DU ISO image and reconnect the Solaris installation media before continuing.

Solaris 10 3/05 With Solaris 10 3/05, the driver must be supplied using the DU floppy with a *legacy* floppy drive.

1. If necessary, create a Driver Update (DU) diskette using the procedure described in **Creating the DU Diskette** above.

2. Begin the installation by booting Solaris with a Configuration Assistant Diskette or with a Solaris 10 Software CD 1 (of 4).
3. When prompted, press the ESC key to enter the Device Configuration Assistant.
4. At the *Configuration Assistant* screen, choose the F4 option “F4_Add Driver”.
5. When the *Install Supplemental Drivers* screen is displayed, remove the Configuration Assistant diskette, if used, and insert the CPQary3 DU diskette into the floppy drive.
6. Select F2_Continue, and Solaris will load the Smart Array controller driver from the diskette into memory.
7. Add any additional drivers using the DU diskettes provided by the vendors. Once all of the required drivers have been added, remove the DU diskette and, if it was used to boot the system, re-insert the Configuration Assistant diskette. Select F4_Done.
8. The *Identified Device Drivers* screen is displayed. Select F2_Continue to proceed with the installation of the Solaris 10 Operating System.
9. Near the end of the installation, the installation process will prompt again for the CPQary3 DU diskette. Remove the Configuration Assistant diskette from the floppy drive, if used, and re-insert the CPQary3 DU diskette.
10. Press ENTER to continue, and the Solaris installation process will install the CPQary3 package to the new system. Messages similar to the following are displayed during a successful driver installation:

```
Installing package CPQary3
Third Generation Array Controllers
(i386) VERSION=1.6.0,REV=2006.05.18.01.06
```

```
Copyright 2006 Hewlett-Packard Development Company, L.P.
```

```
All Rights Reserved.
```

```
Installation of <CPQary3> was successful.
```

11. Remove the DU diskette from the floppy drive, and follow the on-screen instructions to complete the Solaris installation.

Installing the Driver on an Existing Installation

The following procedure should be followed to install the Smart Array Controller driver on to an existing Solaris 10 system to use the disk volumes configured on Smart Array controllers.

1. If necessary, unpack the distribution as described above under **Unpacking the Distribution**.
2. The CPQary3 distribution includes an install script that should be used to install the driver package. Execute the install script to install the driver (you will need to be root):

```
$ pwd
/var/tmp/CPQary3-x.yy-solaris10-i386
$ su
# ./DU/sol_210/i86pc/Tools/install.sh -i
.
.
Installation of <CPQary3> was successful.
```

A message similar to the above is displayed following a successful installation.

3. The system must be rebooted in order to configure the driver and identify the attached disk volumes:

```
# touch /reconfigure
# init 6
```

Installing the Driver Into a GRUB-based Miniroot

This section applies to Solaris 10 1/06 and beyond.

Because the Smart Array driver is not currently shipped on Solaris media, the driver is not present in the Solaris install miniroot or in the Solaris failsafe miniroot. The following procedure can be used to install the Smart Array driver into a Solaris GRUB-based miniroot. This can be useful for PXE boot-based or other non-interactive installations as well as for failsafe mode-based recovery.

NOTE: In earlier versions of the driver, it was necessary to remove and then restore the `bootenv.rc` symlink. With version 1.70 of the driver and beyond, this is no longer necessary, as indicated in steps 4 and 6 below.

1. If necessary, unpack the distribution as described above under **Unpacking the Distribution**.
2. Preserve a backup copy of the miniroot that is to be modified.
3. Unpack the miniroot that is to be modified into a temporary directory:

```
$ su
# /boot/solaris/bin/root_archive unpack ../x86.miniroot /var/tmp/mr
```

4. *If installing a version of the driver prior to 1.70*, convert `bootenv.rc` from a symlink to a regular file:

```
# cd /var/tmp/mr/boot/solaris
# ls -l bootenv.rc
... bootenv.rc -> ../../tmp/root/boot/solaris/bootenv.rc
# rm bootenv.rc
# cp ../../tmp/root/boot/solaris/bootenv.rc ./
```

5. Install the Smart Array driver into the miniroot:

```
# cd ../CPQary3-x.yy-solaris10-i386
# ./DU/sol_210/i86pc/Tools/install.sh -i -R /var/tmp/mr
.
.
Installation of <CPQary3> was successful.
```

6. If installing a version of the driver prior to 1.70, restore `bootenv.rc` to a sym-link:

```
# cd /var/tmp/mr/boot/solaris
# cp bootenv.rc ../../tmp/root/boot/solaris/bootenv.rc
# rm bootenv.rc
# ln -s ../../tmp/root/boot/solaris/bootenv.rc bootenv.rc
```

7. Re-pack the modified miniroot and clean up:

```
# cd /
# /boot/solaris/bin/root_archive pack ../x86.miniroot /var/tmp/mr
# rm -Rf /var/tmp/mr
# exit
$
```

Installing the Driver Using JumpStart

Successful network deployment of Solaris on ProLiant requires: 1) the Smart Array driver to be loaded at installation time, and 2) the driver to be installed in the target root disk so that it is available when the newly-installed system is rebooted. The first requirement can be satisfied by installing the driver into the miniroot, as described above.

The second requirement is usually accomplished using the existing capabilities of JumpStart. This section provides a brief introduction to those features of JumpStart that can be used to deliver the driver package to the target system during network-based installation. The following Sun documentation should also be consulted:

- The *Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations* guide, specifically the *Using Custom JumpStart* section. The Solaris 10 6/06 version of this guide is available at <http://docs.sun.com/app/docs/doc/819-5778>. The following chapters/subsections of this guide are particularly useful:
 - Chapter 7 “Using Optional Custom JumpStart Features” / “Creating Finish Scripts” / “Adding Packages or Patches With a Finish Script”

- Chapter 11 “Custom JumpStart (Reference)” / “Profile Keywords and Values”

Consider the following procedure:

1. If necessary, unpack the driver distribution as described above under **Unpacking the Distribution**. The CPQary3 package is included in the distribution tarball in a Solaris package directory format under `CPQary-x.yy-solaris10-i386/CPQary3.pkg/`:

```
$ cd ../CPQary3-x.yy-solaris10-i386
$ pkginfo -d CPQary3.pkg
system      CPQary3 Third Generation Array Controllers
$
```

2. Copy the CPQary3 package to a directory on a network file server, perhaps the JumpStart server or the install image server. Make this directory available to clients via NFS. For example:

```
$ mkdir /jumpstart/pkg
$ cp -R CPQary3.pkg/CPQary3 /jumpstart/pkg
```

3. Configure JumpStart to install the CPQary3 package during installation. This can be accomplished in one of several ways, two of which are briefly described here (do one of the following):

- Add a "package" directive to the JumpStart profile, specifying the NFS mount path to the directory containing the `CPQary3/` directory. For example:

```
package CPQary3 add nfs://../jumpstart/pkg
```

- In a JumpStart finish script, first NFS mount the directory with the package, then run `pkgadd` and specify the install root using `-R`. The install root is usually mounted at `/a` during installation.

See the Sun documentation for a much more complete example.

Loading the Driver in Failsafe Mode

Solaris 10 1/06 and beyond has a failsafe mode boot option. In failsafe mode, GRUB loads a failsafe miniroot from which Solaris is booted. Because the Smart Array driver does not currently ship on Solaris media, the driver is not present in the failsafe miniroot. In certain situations, it may be necessary to boot a failsafe miniroot (or install miniroot, eg. from CD) that does not have the Smart Array driver, in order to repair an installation on Smart Array-attached disks.

The procedure below can be used to load the Smart Array driver at run-time, after booting an unmodified failsafe or install miniroot. This installation of the driver does not persist across reboots; see **Installing the Driver Into a GRUB-based Miniroot** above to affect a persistent installation.

1. If necessary, create a Driver Update (DU) diskette or CD-ROM using the procedures described in **Creating the DU Diskette** or **Creating the DU CD-ROM** above.
2. Boot the failsafe miniroot or an installation CD. *If booting an installation CD*, select “Single user shell” from the initial installation menu.
3. Once at the shell prompt, initiate DU installation:

```
# install-du
```

and follow the prompts to install the driver using the DU diskette or CD-ROM.

4. After driver installation, have Solaris search for OS installations, if necessary:

```
# install-recovery
```

Configuration

Please refer to the *cpqary3(7D)* man page for complete configuration requirements.

In particular, if more than 14 logical volumes are configured or if a tape drive is connected on any Smart Array Controller, appropriate changes must be made to the

system configuration for proper operation. Details of such configuration changes are described in the *cpqary3(7D)* man page.

Useful References

For more information, please consult the following sources:

- **Release Notes** The release notes for the CPQary3 package are supplied in the distribution tar file as `RELEASENOTES.CPQary3`. These notes contain information such as the revision history, new features added, obsolete features removed, and a list of known issues.
- ***man(1)* Page** The *cpqary3(7D)* man page is provided with the CPQary3 package. It provides detailed information about the Smart Array Controller driver.
- **Sun Documentation** “Solaris 10 Installation Guide: Basic Installations”. See the section titled “x86: Performing an Installation or Upgrade With the Solaris Installation Program”. Available at <http://docs.sun.com>.

Package Maintenance

Package Removal

WARNING: After removing the driver, all disk volumes attached to the server's Smart Array controllers will be inaccessible!

To remove the CPQary3 driver, use the following procedure:

1. Make sure that a current backup of the server is available, especially that of data that resides on disk volumes attached to Smart Array controllers.
2. Verify that the package is currently installed on the system:

```
$ pkginfo CPQary3
system      CPQary3 Third Generation Array Controllers
$
```

The above message is displayed if the CPQary3 package is installed. An error message is displayed if the package is not installed.

3. Remove the package using *pkgrm(1M)* (you may need to be `root` to use *pkgrm*):

```
$ su
# pkgrm CPQary3
```

WARNING: If the boot controller is a Smart Array controller, the CPQary3 package (possibly a different version) **must** be re-installed prior to rebooting or shutting down the system. Failing to do so will result in the system being unable to boot.

4. In order to complete the removal of the driver, the system must be rebooted:

```
# touch /reconfigure
# init 6
```

Package Upgrade

To upgrade the CPQary3 package:

1. Uninstall the current package as described above in **Package Removal**, *but do not reboot the system* yet.
2. Add the new package, following the steps outlined above in **Installing the Driver on an Existing Installation**.