

# Smart Array 5300A Backplane RAID Controllers Installation and Configuration Guide

Part Number: EK-SA530-IN. D01

Fifth Edition (August 2003)

Product Version: 2.0

This guide provides installation and configuration information for the Smart Array 5300A backplane RAID controllers. The information in this guide is for step-by-step instructions for installing and configuring the RAID controllers.



i n v e n t

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Smart Array 5300A Backplane RAID Controllers Installation and Configuration Guide  
Fifth Edition (August 2003)  
Part Number: EK-SA530-IN. D01

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Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

EN55022:1998 (CISPR 22) - Electromagnetic Interference

EN55024:1998 (CISPR 24) - Electromagnetic Immunity

EN60950:2000 (IEC950) - Product Safety

EN61000-3-2:1995 - Harmonic Current Emissions

EN61000-3-3:1995 - Voltage Fluctuations Flicker

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# About this Guide

This guide provides installation and configuration information for the SA5302A and SA5304A backplane RAID controllers. The information in this guide is for step-by-step instructions for installing and configuring the RAID controllers.

## Intended Audience

This guide is intended for owners and users of the SA5300A series backplane RAID controllers.

## Related Documentation

In addition to this guide, HP provides additional information in the following documents:

- QuickSpec - HP Smart Array 5300A RAID Controller for AlphaServer Systems
- QuickSpec for your specific AlphaServer
- Smart Array 5300 Controller User Guide, 4th Edition (135606-003) or later
- Release Notes for Smart Array 5300A Series RAID Controllers for AlphaServer Systems
- HP StorageWorks Enclosure 4200 Family LVD Disk Enclosures Users Guide
- HP StorageWorks Enclosure Model 4300 Family Ultra3 LVD Disk Enclosures Users Guide
- Alpha Systems Firmware Release Notes for your specific Alpha Server, V6.3 or later
- Array Configuration Utility XE User Guide
- Compaq Analyze Users Guide, version 4.1 or later
- Release Notes for Compaq Analyze, version 4.1 or later

- Tru64 UNIX New Hardware Delivery (NHD5) Release Notes and Installation Instructions
- Management Agents for AlphaServers for Tru64 UNIX Reference Guide, V3.0 or later
- OpenVMS Alpha Version 7.3-1 Release Notes
- OpenVMS Alpha Version 7.3-1 Upgrade and Installation Manual
- User's Guide to HP Management Agents for OpenVMS, version 2.4 or later
- Release Notes for HP Management Agents for OpenVMS, version 2.4 or later
- White Papers
  - Hot Plug Disk Drive Removal and Replacement Guidelines for Compaq Smart Array Controllers, 11DT-119A-WWEN
  - Smart Array Technology: Advantages of Battery-Backed Cache, TCO2020TB

## Document Conventions

This document uses the following conventions:

- *Italic type* is used for complete titles of published guides or variables. Variables include information that varies in system output, in command lines, and in command parameters in text.
- **Bold type** is used for emphasis, for onscreen interface components (window titles, menu names and selections, button and icon names, and so on), and for keyboard keys.
- `Monospace typeface` is used for command lines, code examples, screen displays, error messages, and user input.
- `Sans serif typeface` is used for uniform resource locators (URLs).



## Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.



**WARNING:** Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life. Consult your documentation for specific details.

---



**CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

---

**IMPORTANT:** Text set off in this manner presents clarifying information or specific instructions.

**NOTE:** Text set off in this manner presents commentary, sidelights, or interesting points of information.

## Symbols on Equipment



Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

**WARNING:** To reduce the risk of injury from electrical shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

---



Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

**WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

---



Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

**WARNING:** To reduce the risk of injury from a hot component, allow the surface to cool before touching.

---



Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

**WARNING:** To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

---



Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

**WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

---

## Rack Stability



**WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
  - The full weight of the rack rests on the leveling jacks.
  - In single rack installations, the stabilizing feet are attached to the rack.
  - In multiple rack installations, the racks are coupled.
  - Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.
-

## Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website.

## HP Technical Support

In North America, call 1-800-652-6672, available 24 hours a day, 7 days a week.

**NOTE:** For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call technical support at the nearest location. Telephone numbers for worldwide technical support are listed on the HP/Compaq website:

<http://www.hp.com/country/us/eng/support.html>

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

## HP Website

The HP website has the latest information on this product, as well as the latest drivers and flash ROM images. Access the website at:

<http://www.hp.com/country/us/eng/prodserv/storage.html>

From this website, select the appropriate product or solution.

## HP Authorized Reseller

For the name of your nearest HP Authorized Reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers  
<http://www.hp.com>.



---

# Smart Array 5300A Controller Information

## Overview of Features

Smart Array 5300A Backplane RAID controllers are a new series of PCI backplane RAID controllers for AlphaServers. SA5300A controllers are members of the Smart Array 5300 family of controller products with hardware, firmware and software components specifically qualified for use on Alpha systems. There are two variants: Smart Array 5302A (2-channel) controller and Smart Array 5304A (4-channel) controller.

Option Model	Part Number
SA5302A/128: 2-ch 128 MB Cache	3X-KZPDC-BE
SA5304A/256: 4-ch 256 MB Cache	3X-KZPDC-DF

Smart Array 5300A controller features include:

- Support for operation in PCI 33 MHz and 66 MHz 64 bit buses.
- Two or four Ultra3 SCSI channels with support for up to 28 or 56 drives total (14 drives per channel).
- Support for attached Compaq Universal Ultra3 and Ultra2 SCSI Drives
- Fault tolerance: RAID 0, 1, 0+1, 5, and Advanced Data Guarding.
- Utilities: web based Monitoring software (SNMP Agent), web based Configuration and Management software (ACU-XE), and an Off-line Configuration utility (ORCA).
- For all supported operating systems, the latest patch is strongly recommended. Minimum operating system support:
  - *Tru64 UNIX*: Version 5.1A with NHD5 or later and V5.1A Patch Kit 4
  - *Tru64 UNIX*: Version 5.1B with PK2
  - OpenVMS: Version 7.3-1 with TIMA kit:  
DEC-AXPVMS-VMS731\_FIBRE\_SCSI-V0300--4.PCSI

- Software Features: Hot Spare, On-line array Expansion, On-line RAID and Stripe-size Migration, Advanced Data Guarding, Off-line Firmware Updates with SRM console LFU utility, Alpha Drive Firmware Update Utility.

See Chapter 1 of the *HP Smart Array 5300 Controller User Guide* for more features information.

**NOTE:** The Smart Array 5300A series controllers are similar but distinct from the Smart Array 5300 family. Hardware, firmware and software components for the SA5300A family may differ from those for the SA5300. See the Smart Array 5300A Release Notes and visit the Smart Array 5300A web site for a latest list of supported product components.

## Controller Upgrade Options

Table 1–1 lists option upgrade information for Smart Array 5300A controllers.

**Table 1–1: Controller Upgrade Options**

256MB Cache Module for Smart Array 5302A Controller	254786-B21
Ultra160 Channel Expansion Module for Smart Array 5302A Controller	153507-B21
Battery Pack, Ni-MH for Battery Backed Cache Module (Spare)	120978-001
Advanced Data Guarding Module for SA 5302A	199371-B21
<b>External VHDCI Cables:</b>	
VHDCI-VHDCI 6 ft. cable	3X-BC56J-02
VHDCI-VHDCI 12 ft. cable * shipped with 4300 StoraGeworks Enclosures	3X-BC56J-03
VHDCI-VHDCI 24 ft. cable	3X-BC56J-04
<b>Internal Cables:</b>	
Shipped with BA-610-6D Internal Drive Cage	

**NOTE:** Certain hardware options supported with the Smart Array 5300 controllers on ProLiant systems are not supported for installation on Smart Array 5300A controllers. The list includes the 32MB and 64 MB Cache modules as well as the SAN Access Module.



**WARNING:** To prevent injury, access is limited to persons who have appropriate technical training and experience. Such persons are expected to understand the hazards of working within this equipment and take measures to minimize danger to themselves or others.

---



**WARNING:** To prevent fire, use only modules with current limited outputs. See National electrical Code NFPA 70 or Safety of Information Technology Equipment, Including Electrical Business Equipment EN 60 950.

---



**WARNING:** High current area. Currents exceeding 240 VA can cause burns or eye injury. Avoid contact with parts or remove power prior to access.

---



**WARNING:** The I/O area houses parts that operate at high temperatures. Avoid contact with components to prevent a possible burn.

---



**CAUTION:** Smart Array 5300A controllers contain static sensitive components. Use ESD precautions when handling the controller.

---

## Getting Started Overview

To install the Smart Array 5300A Controller in your HP AlphaServer, you should perform these basic steps in order:

1. Determine that your system meets the requirements for the Smart Array 5300A controller. For supported system compatibility and requirements, refer to the Release Notes and Quickspecs on the Smart Array 5300A web page:

<http://h18002.www1.hp.com/alphaserver/products/storage/sa5300a/>

You should also reference the Quickspecs for the specific HP AlphaServer in which you are planning to install the controller.

2. Identify the contents of the Option Kit.
3. Install the Smart Array 5300A controller in your server and connect your storage.  
**TIP: For best performance install the controller in a 66MHz PCI slot.**

4. Power up your system.

**IMPORTANT:** Be sure to power up your attached storage enclosure(s) *before* powering up the HP AlphaServer. When powering down you should power down your server *first* then power down your attached storage enclosures.

5. Configure your array
  - a. Boot Device – If your boot device is a Smart Array 5300A logical volume then this device must be configured using the offline configuration utility.
  - b. Data Device – Can be configured with the offline or online config utilities.
6. Install Operating System (if necessary) and the Smart Array 5300A Monitoring and Configuration Utilities.

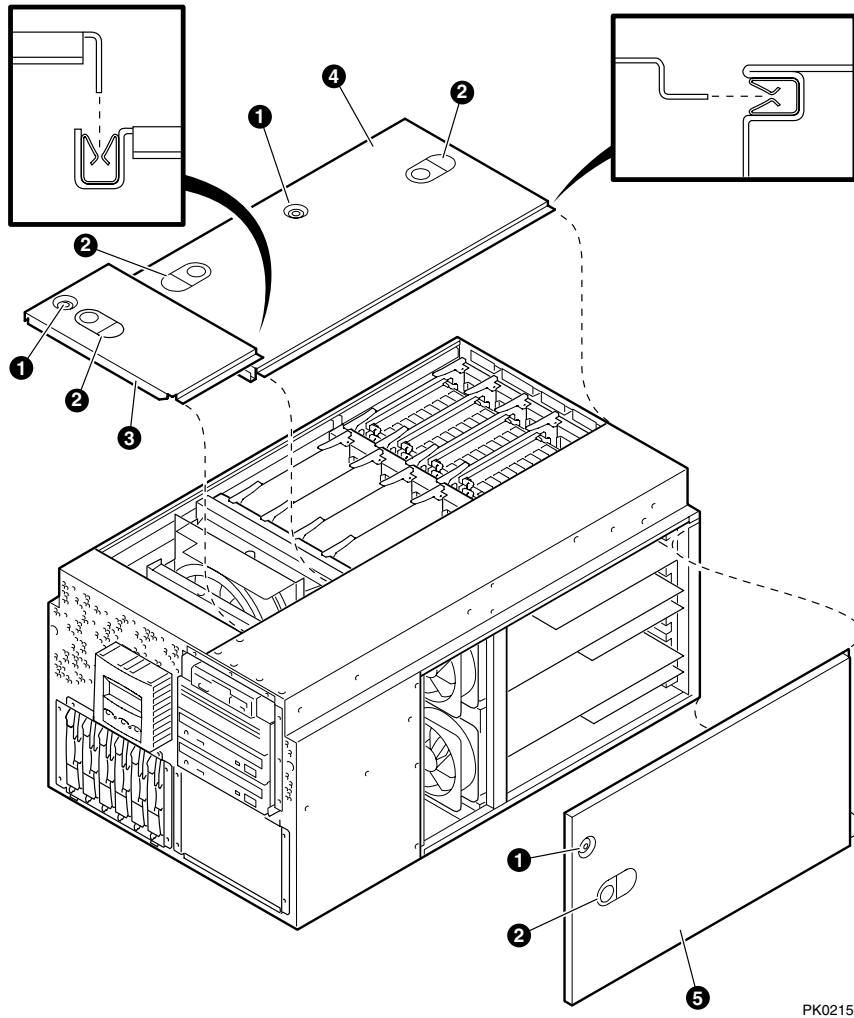
## Removing the PCI Card Cage Cover

Your Smart Array 5300A controllers fit into a full length PCI system slot. The following procedure explains how to install the controller into a HP AlphaServer ES45.

To install the controller:

1. Turn off all external devices and then remove power from your system.
2. Remove the PCI card cage cover from your system (See Figure 1–1: Covers on the AlphaServer ES45 System Chassis (Pedestal/Rack). The AlphaServer ES45 is used in this example; however, for information on your specific model, reference that owner's guide.





**Figure 1-1: Covers on the AlphaServer ES45 System Chassis (Pedestal/Rack)**

**Table 1–2: System Cover Components**

❶	3mm Allen captive quarter-turn screw that secures each cover.
❷	Spring-loaded ring that releases cover. Each cover has a ring.
❸	Fan area cover. This area contains the 6.75-in main system fan and a redundant fan.
❹	System card cage cover. This area contains CPUs, memory DIMMs, MMBs, and system motherboard. To remove the system card cage cover, you must first remove the fan area cover ❸. An interlock switch shuts the system down when you remove the system card cage cover.
❺	PCI card cage cover. This area contains PCI cards, the PCI backplane, I/O connector assembly and four fans.

## Installing a Smart Array 5300A Module

Complete the following procedure to add or remove a PCI option card. (Refer to Figure 1-2)



**CAUTION:** Hot plug is not currently supported. Do not press switches ❷ or ❸ on the hot-swap board. Pressing switches can result in loss of data.

1. Turn off the system power.
2. Unscrew the captive screw ❶ from ❸.
3. Press in latch button ❸ and open the latch.

If you will remove a PCI option card, perform step 4.

or

If you will insert a Smart Array 5300A controller into a blank slot, perform step 5.

4. Remove the PCI option card ❺.
5. To install a SA5300A controller card into an unused slot, remove the blank bulkhead ❺.
6. Install the SA5300A controller card.

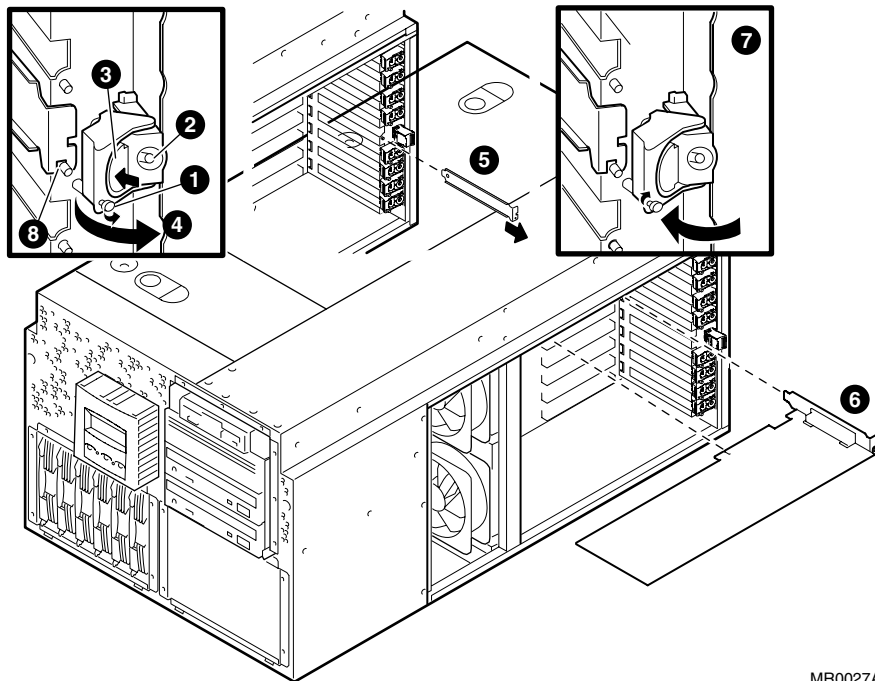
**NOTE:** For best performance the Smart Array 5300A should be installed in vacant 66 Mhz capable PCI slots.

7. Close latch ⑦.
8. Tighten the captive screw ① into ⑧.
9. Replace the PCI card cage cover.

**NOTE:** If your Smart Array 5300A controller will be used in a DS- or GS- series AlphaServer it is necessary to install the included ISA Extension Bracket before installing the controller into the system's option bay.

## Verification

1. Turn on power to the system.
2. During power-up, observe the screen display for PCI information. The SA5300A controller should be listed in the display in the following manner:  
  
Bus y slot z – pyx– HP Smart Array 5300
3. Issue the SRM **show configuration** command. Examine the PCI bus information in the display to make sure that the new option is listed. Your SA5302A or SA5304A controller will be presented at the prompt as a pyX0 device (where X is a corresponding controller id).



MR0027A

Figure 1–2: Installing a Smart Array 5300A Module

## Set up and Use of the SRM Console Environment with Smart Array 5300A Controllers

If a Smart Array 5300A logical volume is intended to be used as an operating system boot device you need to complete the following procedure to properly set up the Alpha SRM console after physically installing the SA5300A controller.

**NOTE:** Your system must be installed with a supported SRM console firmware version. See the system specific release notes for the supported versions.

1. P0>>> set HEAP\_EXPAND 2MB <-(this operation is not valid for ES47, ES80, and GS1280)
2. P0>>> initialize
3. P0>>> set BOOTBIOS pya0 (or any other controller you want to use)
4. P0>>> initialize

The steps shown enable the logical volumes residing on a Smart Array 5300A controller pointed to by BOOTBIOS (pya0 in the above example) to become visible at the SRM console. This is a prerequisite to booting off a Smart Array 5300A logical volume. Setting BOOTBIOS will cause the BIOS on the selected controller to be executed automatically whenever the console is initialized.

5. Use the **show bootbios** command to verify the BOOTBIOS variable.

The steps listed above are not required if Smart Array 5300A logical volumes are not used as boot devices.

**NOTE:** When you execute a **show device** SRM command you will only be able to see configured logical volumes behind the Smart Array controller for which the bootbios variable is set. To see logical devices behind another Smart Array controller, you first need to set the bootbios variable to point to that controller.

## Supported Devices

The Smart Array 5300A controllers only support Ultra 160 and Ultra 80 capable universal disk drives. Some of the older drives might need to have their firmware updated before they can be used with the Smart Array controllers.

Running BIOS on the controller can identify those drives in your configuration that require updates. You will be presented with a list of drives - the candidates for updates.

The drive firmware update utility for the Smart Array 5300A controllers is shipped on a CD with the controller. This is a bootable CD. Insert this CD into your AlphaServer CD-ROM drive, then boot this drive and follow the instructions that are displayed.

Smart Array 5300A controllers do not support Hot Plug tape drives.

## Running ORCA Off-line Configuration Utility With SRM Console

The BIOS of any Smart Array controller installed in the system may be executed from the Alpha SRM console at anytime by use of the console command 'run bios pyX0'

In addition, the 'show BIOS' command may be used for discovering BIOS enabled controllers in the system, i.e.:

```
P0>>> show bios
vga0.0.0.1.0 - DEC PowerStorm
pyb0.0.0.4.0 - HP Smart Array 5300
pka0.7.0.2000.0 - NCR 53C875
pkb0.7.0.2001.0 - NCR 53C875
pya0.0.0.5.1 - HP Smart Array 5300
```

To run the BIOS-based configuration utility, you need first to invoke BIOS on the desired Smart Array controller:

```
P0>>> run bios pyX0
where pyX0 is a desired controller to be configured
```

This command invokes the ORCA utility that will enable you to configure logical units. The following information is displayed:

```
Slot 9 Compaq Smart Array 5300 Controller Initializing..
Press <F8> to run the Option ROM and Configuration for Arrays utility
Press <ESC> to skip configuration and continue
```

After **F8** has been pressed, you will see the main ORCA menu, which allows you to create, view, or delete a logical drive.

```
Option Rom Configuration for Arrays, version 2.14
Copyright 2003 Hewlett-Packard Development Company, L.P.

Controller: HP Smart Array 5300, slot 8
Direct-Attached Storage

+-----Main Menu-----+
| Create Logical Drive    |
| View Logical Drive     |
| Delete Logical Drive   |
+-----+

<Enter> to create a new logical drive
<UP/DOWN ARROW> to select main menu option; <ESC> to exit
```

**Figure 1–3: ORCA Main Menu**

```
Option Rom Configuration for Arrays, version 2.14
Copyright 2003 Hewlett-Packard Development Company, L.P.

Controller: HP Smart Array 5300, slot 8
Direct-Attached Storage

+-----Available Logical Drives-----+
| Logical Drive # 1, RAID 1, 16.9 GB, OK
| Logical Drive # 2, RAID 5, 25.4 GB, OK
| Logical Drive # 3, RAID 1, 16.9 GB, OK
| Logical Drive # 4, RAID 1, 8.5 GB, OK
| Logical Drive # 5, RAID 1, 8.5 GB, OK
| Logical Drive # 6, RAID 1, 8.5 GB, OK
| Logical Drive # 7, RAID 5, 21.5 GB, OK
| Logical Drive # 8, RAID 1, 8.5 GB, OK
| Logical Drive # 9, RAID 1, 17.0 GB, OK
| Logical Drive #10, RAID ADG, 14.4 GB, OK
| Logical Drive #11, RAID 0, 8.5 GB, OK
| Logical Drive #12, RAID 0, 8.5 GB, OK
| Logical Drive #13, RAID 0, 8.5 GB, OK
+-----+

<Enter> to view logical drive details
<UP/DOWN ARROW> to select logical drive; <ESC> to return
```

Figure 1-4: View Logical Drive Menu



```

Option Rom Configuration for Arrays, version 2.14
Copyright 2003 Hewlett-Packard Development Company, L.P.

Controller: HP Smart Array 5300, slot 8
Direct-Attached Storage
+-----Available Physical Drives-----+ +---Raid Configurations-----+
| [X] SCSI Port 1, ID 4, COMPAQ 9.1 GB | | [X] RAID ADG |
| [X] SCSI Port 2, ID 4, COMPAQ 18.2 GB | | [ ] RAID 5 |
| [X] SCSI Port 4, ID 4, COMPAQ 72.8 GB | | [ ] RAID 1 (1+0) |
| [X] SCSI Port 4, ID 11, COMPAQ 18.2 GB | | [ ] RAID 0 |
+-----+-----+-----+-----+
+-----Spare-----+
| [ ] Use one drive as spare |
+-----+-----+
+--Maximum Boot partition--+
| [X] Disable (4GB maximum) |
| [ ] Enable (8GB maximum) |
+-----+-----+

<Enter> to create a logical drive; <Tab> to navigate
<UP/DOWN ARROW> to scroll; <ESC> to return; <Space Bar> to select

```

**Figure 1–5: Create Logical Drive Menu**

To create a logical drive:

1. Choose the Create Logical Drive menu option.

The screen now displays a list of all available (not configured) physical drives and the valid RAID options, and allows you to configure a spare drive for the array.

**NOTE:** You can only create one logical drive at a time.

2. Use the arrow keys, space bar, and tab key to navigate around the screen and set up your logical drive.
3. Press **Enter** to accept the settings. If you do not want to make a logical volume with the drives that are highlighted with the “X”, select the drive via the arrow key and use the space bar to deselect. On initial install all available drives on the first SCSI bus will be selected.
4. At the next screen, press **F8** to confirm your settings and save the new configuration

5. After several seconds, the Configuration Saved screen is displayed. Press **Enter** to continue.

You can now create another logical drive on any remaining available hard drives by repeating the previous steps.

When you have a logical volume or disk selected in ORCA, the drive fault light on all of the physical drives associated with that logical volume will be on as a locator indicator for the user.

After exiting the ORCA utility, issue the following SRM commands to view your newly created logical units:

6. P0>>> initialize
7. P0>>> show configuration

#### Example 1-1: Show Config

```
Bus 00 Slot 09:  HP Smart Array 5300  pya0.0.0.9.0
                                     dya1.0.0.9.0  CPQCISS
                                     dya2.0.0.9.0  CPQCISS
                                     dya0.0.0.9.0  CPQCISS
```

## Upgrading Controller Firmware

Use the SRM console LFU utility to update the firmware on the controller. The following is an example of updating the firmware on a supported Alpha Server with a firmware image located on a floppy disk (SA5300A firmware can also be downloaded via CD-ROM):

1. Invoke the console Loadable Firmware Update Utility (LFU). At the SRM prompt, type:

```
P0>>> LFU
```

2. After arriving at the LFU update prompt, type:

```
UPD> update pya0 -p fat:KZPDCxxx.bin/dva0
```

In this example, pya0 is the name of the controller device to be updated; fat is the file system type;

KZPDCxxx.bin is the firmware file image name; and dva0 is the floppy device containing the image.

3. After the firmware image is read from the floppy media, confirm the update procedure and wait for the verification of the updated controller firmware image.
4. When complete you may update other controllers substituting their controller device name accordingly. When all controllers have been updated, complete the update procedure by exiting the LFU utility. Type:

```
UPD> exit
```

**NOTE:** Other methods of updating KZPDC controller firmware may be documented in the Release Notes accompanying the Alpha Firmware CD.

## Operating the Controller Under *Tru64 UNIX*

During the *Tru64 UNIX* boot sequence, Smart Array 5300A controllers will be presented in the following manner as they are being recognized by the O/S (see the `/var/adm/messages` file on your system):

```
Jan 10 09:06:59 nodename vmunix: ciss0 at pci1 slot 4
Jan 10 09:06:59 nodename vmunix: Smart Array 5304A (4-channel, FW
2.82, 256 MB cache)
Jan 10 09:06:59 nodename vmunix: scsi1 at ciss0 slot 0 rad 0
```

If new virtual disks are created by the ACU-XE on-line configuration utility, they are recognized by the kernel immediately upon creation.

Smart Array logical volumes can be viewed with `hwmgr(8)` or `scu(8)` utilities, i.e:

```
nodename 1 # hwmgr -v d
HWID: Device Name           Mfg           Model           Location
-----
6: /dev/dmapi/dmapi
7: /dev/scp_scsi
8: /dev/kevm
56: /dev/disk/floppy0c       3.5in floppy  fdi0-unit-0
61: /dev/disk/dsk0c         COMPAQ       BF01865222     bus-0-targ-0-lun-0
62: /dev/disk/dsk1c         COMPAQ       BD0366349C     bus-0-targ-2-lun-0
66: /dev/disk/dsk5c         COMPAQ       LOGICAL VOLUME bus-1-targ-1-lun-0
68: /dev/disk/dsk7c         COMPAQ       LOGICAL VOLUME bus-1-targ-3-lun-0
69: /dev/disk/dsk8c         COMPAQ       LOGICAL VOLUME bus-1-targ-4-lun-0
70: /dev/disk/dsk9c         COMPAQ       LOGICAL VOLUME bus-1-targ-5-lun-0
71: /dev/disk/cdrom0c       COMPAQ       CRD-8402B      bus-3-targ-0-lun-0
72: /dev/cport/scp0         Smart Array 5300 bus-1-targ-32-lun-0
```

In this example Smart Array 5300A logical devices can be recognized by a “LOGICAL VOLUME” model name.

Next example shows an output of the scu(8) command:

```
scu> show edt
CAM Equipment Device Table (EDT) Information:
Bus/Target/Lun Device Type ANSI Vendor ID Product ID Revision N/W
-----
0 0 0 CD-ROM SCSI-2 COMPAQ CRD-8402B 1.03 N
3 0 0 Direct SCSI-2 COMPAQ BD009635C3 B017 W
3 2 0 Direct SCSI-2 COMPAQ BD009122BA 3B07 W
4 0 0 Direct SCSI-2 DEC RZ1CB-CS (C) DEC 0844 W
4 1 0 Direct SCSI-2 DEC RZ28M (C) DEC 0616 W
4 2 0 Direct SCSI-2 DEC RZ1DF-CF (C) DEC 1614 W
4 3 0 Direct SCSI-2 DEC RZ1BB-CS (C) DEC 0844 W
4 4 0 Direct SCSI-2 COMPAQ BD0366349C 3B06 W
4 5 0 Direct SCSI-2 COMPAQ BD0186349B 3B12 W
4 6 0 Direct SCSI-2 COMPAQ BA03611C9B 3BS8 W
5 0 0 Direct SCSI-2 COMPAQ LOGICAL VOLUME 2.86 N
5 1 0 Direct SCSI-2 COMPAQ LOGICAL VOLUME 2.86 N
5 2 0 Direct SCSI-2 COMPAQ LOGICAL VOLUME 2.86 N
5 32 0 RAID SCSI-2 COMPAQ Smart Array 5300 2.86 N
```

Virtual disks that have been deleted with ACU-XE will still be present at the hwmgr database in the “stale” state. These devices will be deleted from the database upon a next reboot or they can be deleted manually with the hwmgr “delete” command.

## Installing and Using the *Tru64 UNIX* On-line Monitoring Utility

With the HP Management Agents for *Tru64 UNIX* you can:

- View your *AlphaServer* hardware configuration including all installed Smart Array 5300A controllers and attached storage devices.
- Monitor the state of the system locally or remotely.
- Locate logical and physical drives attached to Smart Array 5300A controllers by flashing the relevant drive LEDs.

The *Tru64* SNMP Storage Agent for the Smart Array 5300A controller is installed as part of the HP Management Agents kit software.

HP Management Agents are delivered on the HP Management CD or the *Tru64 UNIX* website. Support for Smart Array 5300A series controllers was introduced in the V3.1 HP Management Agents kit for Tru64 UNIX. This kit appears on the V6.2 HP Management CD.

The HP Management Agents for *Tru64 UNIX* website is:

<http://tru64unix.compaq.com/cma/>

Refer to the Compaq Management Agents for *Tru64 UNIX* Reference Guide found on the *Tru64 UNIX* web site for installation and configuration instructions as well as for the guidelines for using the HP Management Agents.

**NOTE:** In order to be able to use the drive locate function via the Storage Management Agent, the community permission in the `/etc/snmpd.conf` file must be set to write. The format for a community definition is:

```
community <community_name> <IP address> <permission>
```

See the section entitled “Configuring Tru64 UNIX for SNMP Set and Trap Operations” in the *Management Agents for AlphaServers for Tru64 UNIX Reference Guide* for detailed instructions on enabling write permission for SNMP communities.

**NOTE:** This modification has *security implications*. Consult the `snmpd(8)` man pages for more information.

You will have to reboot or restart the HP Management Agents after making this change.

## Installing and Using the *Tru64 UNIX* On-line Array Configuration Utility (ACU-XE)

This section provides information for installing and using the ACU-XE utility.

The latest supported version and the WEB location of the ACU-XE utility is specified in the Smart Array 5300A Release Notes.

A user guide for the ACU-XE utility can be downloaded from the following location:

<ftp://ftp.compaq.com/pub/products/servers/proliantstorage/acu-xe-userguide.pdf>

Version 3.1 or later of the HP Management Agents for Tru64 UNIX software must be installed on the target system prior to installation of the ACU-XE utility.

The following is an example of the installation procedure:

1. Download the **CPQACUXE13071A.tar** file to a target system.
2. Ensure that you have root permissions on the target system.
3. Uncompress the tar file  
**tar xvf CPQACUXE13071A.tar**
4. Run **/usr/sbin/setld -1 CPQACUXE13071A** at the prompt.

Example display follows:

```
*** Enter subset selections ***  
  
The following subsets are mandatory and will be installed  
automatically unless you choose to exit without installing any  
subsets:  
  
* Compaq Array Configuration Utility XE version 1.30.7.0 for  
Tru64 UNIX  
  
You may choose one of the following options:  
  1) ALL of the above  
  2) CANCEL selections and redisplay menus  
  3) EXIT without installing any subsets
```

5. Enter your choice: **1**

Example display follows:

```
You are installing the following mandatory subsets:  
  
Compaq Array Configuration Utility XE version 1.30.7.0 for Tru64  
UNIX  
  
You are installing the following optional subsets:  
Estimate free disk space (MB) in root:791.9 usr:4782.1
```

**Is this correct? (y/n):**

6. Enter **y**

Example display follows:

```
Setld:
Checking file system space required to install selected subsets:

File system space checked OK.
1 subsets will be installed.
Loading subset 1 of 1 ...

  Compaq Array Configuration Utility XE version 1.30.7.0 for Tru64
  UNIX

      Copying from cpqacuxepackB1 (disk)
      Verifying

1 of 1 subsets installed successfully.

Configuring "Compaq Array Configuration Utility XE version 1.30.7.0
for Tru64 UNIX" (CPQACUXE13071A)
```

## Running the ACU-XE Configuration Utility

Run `/usr/sbin/cpqacuxe -h` for a display of all the command line options for running ACU-XE:

```
Compaq Array Configuration Utility XE version 1.30.7.0
The Compaq Array Configuration Utility XE (ACU-XE) allows you to
configure and manage your Smart Array storage through a web
browser.
Format: cpqacuxe [Option]
Options: (use one only)
-d, --disable-remote    Disable remote connection(default).
-R, --enable-remote    Enable remote connection.
-stop                  Stop the server.
-v                    Print version information.
-h, --help             Print this page.
```

Administrative login in the HP Management Agent Home Page is mandatory for prior to connecting to the ACU-XE Home Page.

Administrative login requires the setup of "operator" and "administrator" accounts. You will need to create the following two groups in `/etc/group`: "IM\_admin" and "IM\_oper", and assign user accounts to these groups. Consult the *Management Agents for AlphaServers for Tru64 UNIX Reference Guide* section on "Configuring Users and Groups" for more information.

For example if you want "root" to have Insight Manager Administrative privileges, the entry in `/etc/group` should be similar to:

```
IM_admin::200:root
```

Make sure that you have gone through the following checklist:

1. Only run ACU-XE on servers that are on a local intranet or a secure network.
2. Secure the management port (port 2301).

Invoking `cpqacuxe` without any options disables remote connection. To connect from the local browser, enter URL – `http://localhost:2301` in the web browser.

**NOTE:** The ACU-XE utility is not in general recommended for monitoring Smart Array 5300A storage arrays. The Smart Array SNMP Storage Agent should be used instead.

## Uninstalling the ACU-XE

Perform the following steps to uninstall the ACU-XE:

1. Make sure you have root permissions
2. Run `/usr/sbin/setid -d CPQACUXE130` at the command prompt.

Example display follows:

```
Deleting "Compaq Array Configuration Utility XE version 1.30.7.0  
for Tru64 UNIX" (CPQACUXE).
```



## Operating the Controller Under *OpenVMS*

All SCSI disks available to the system including Smart Array 5302A and 5204A logical volumes can be viewed with “\$ show device DK” OpenVMS command:

```
$ show device DK
```

Device Name	Device Status	Error Count	Volume Label	Free Blocks	Trans Count	Mnt Cnt
LAB\$DKA100:	Online	0				
LAB\$DKA400:	Online	0				
LAB\$DKA500:	Online	0				
LAB\$DKB200:	Online	0				
LAB\$DKC0:	Online	0				
LAB\$DKC1:	Online	0				
LAB\$DKC2:	Online	0				
LAB\$DKC3:	Online	0				
LAB\$DKC4:	Online	0				
LAB\$DKC5:	Online	0				
LAB\$DKC7:	Online	0				
LAB\$DKC8:	Online	0				
LAB\$DKD0:	Mounted	0	ALPHASYS	29651673	382	1
LAB\$DKD1:	Online	0				
LAB\$DKD2:	Online	0				
LAB\$DKD3:	Online	0				
LAB\$DKD4:	Online	0				
LAB\$DKD5:	Online	0				
LAB\$DKD6:	Online	0				
LAB\$DKD7:	Online	0				
LAB\$DKD8:	Online	0				

In this example, SA5304A or SA5302A logical devices can be recognized by a single digit device identification. Smart Array logical volumes can have unit numbers from 0 to 31. The device type will be displayed with a “\$ show device /full” command. If new virtual disks are created by the ACU-XE on-line configuration utility, they are recognized by the system immediately upon creation. ‘Show device’ command will however continue to show Smart Array 5300A logical volume device names for deleted volumes until the system is rebooted.

## Installing and Using the OpenVMS On-line Monitoring Utility

The *OpenVMS* SNMP Storage Agent for the Smart Array 5300A controller is installed as part of the HP Management Agents kit software.

HP Management Agents are delivered on the HP Management CD or the *OpenVMS* website. Support for Smart Array 5300A series controllers was introduced in the V2.4 HP Management Agents kit for *OpenVMS*.

The HP Management Agents for *OpenVMS* website is:

[http://www.openvms.compaq.com/openvms/products/mgmt\\_agents/](http://www.openvms.compaq.com/openvms/products/mgmt_agents/)

Refer to the HP Management Agents for *OpenVMS* User Guide found on the *OpenVMS* web site for installation and configuration instructions as well as for the guidelines for using the HP Management Agents.

### Prerequisites for the Open VMS SNMP Storage Agent product:

1. TCPIP Services must be installed and configured on the system.
2. SNMP Services must be configured.

Refer to the following link for obtaining information related to configuring SNMP services within TCPIP for proper operation with OpenVMS Management Agents:

[http://www.openvms.compaq.com/openvms/products/mgmt\\_agents/user\\_man.html](http://www.openvms.compaq.com/openvms/products/mgmt_agents/user_man.html)

### Running the Open VMS SNMP Storage Agent

The process name for the the *OpenVMS* SNMP Storage Agent is WBEM\$CPQIDA.

Change the current working directory to the directory where IDA agent is installed.

```
$ SET DEFAULT SYS$SYSROOT:[WBEM.AGENTS]
```

To run the HP IDA Agent for Smart Array 5300A controller issue this command:

```
"$ $WBEM$RUN_SUBAGENTS.COM"
```

This will start the WBEM\$CPQIDA process.

To verify the Agent has started issue a command "\$ SHOW SYSTEM" and verify the entry of "WBEM\$CPQIDA".

In order to be able to use the drive locate function via the Storage Agent the following change need to be implemented:

In SYS\$SYSROOT:[WBEM.WEB.IM.WEBAGENT]WEBAGENT.INI change the last line

From IDS\_SNMP\_WRITE\_COMMUNITY=noelmginkgo

To IDS\_SNMP\_WRITE\_COMMUNITY=elmginkgo

## View the info on WEB Browser

See the Smart Array 5300A Release Notes for the supported Web browser information.

Launch the web browser with the IP address of the system containing the Smart Array 5300A controller (<http://<ipaddress>: 2301>).

Click on "HP Management Agents for OpenVMS" icon to view the information about the Server running SNMP agents. Select/Click on the link "Smart Array 5300 Controller..." to view the controller information and devices attached to the controller.

## Installing and Using the OpenVMS On-line Array Configuration Utility (ACU-XE)

This section provides information for installing and using the ACU-XE utility on OpenVMS.

The latest supported version and the WEB location of the ACU-XE utility is specified in the Smart Array 5300A Release Notes.

### Prerequisites for the ACUXE product:

1. TCPIP Services must be installed and configured on the system.
2. A supported version of the OpenVMS Management Agents must be installed.

### Procedure to Install.

#### 1. Installation of the ACU-XE utility

Change the default directory to the location where you have downloaded the PSCI kit and issue the following command at the DCL prompt -

```
$PRODUCT INSTALL ACUXE
```

#### 2. Running the ACU-XE utility

ACU-XE requires HP Management Web server process WBEM\$SERVER to display the details on the web browser. The presence of this process could be verified by the following command:

```
$SHOW SYSTEM/PROCESS=WBEM$SERVER
```

```
OpenVMS V7.3-1 on node ASDF 15-AUG-2002 14:17:54.43 Uptime 0
01:13:45
```

```
Pid          Process Name State Pri I/O  CPU          Page fltsPages
0000023E WBEM$SERVER HIB   6   6533 0 00:00:05.62846          772 M
```

Issue the following commands to start ACU-XE.

```
$_SYSSYSROOT:[WBEM.ACUXE]CPQ$ACUXE.COM -R
```

For more information about the command line options issue -

```
$_SYSSYSROOT:[WBEM.ACUXE]CPQ$ACUXE.COM -h
```

"\$\_SYSSYSROOT:[WBEM.ACUXE]CPQ\$ACUXE.COM -R" will start the ACU-XE as a detached process and -R option is required to configure the devices from a remote system, using a web browser.

Smart Array devices can be accessed from the browser by connecting to the HP Management Agents home page:

<http://yoursystemaddress:2301/>

Login as administrator. Administrator login (the default password is "administrator") is mandatory for performing any operation.

Click on the ACU-XE icon. This will launch the ACU-XE Home page.

See the Smart Array 5300A Release Notes for the supported Web browsers information.

## SA5300A Event Logging

All SA5300A controller events on *Tru64* UNIX are reported by the SA5300A UNIX driver and put in the binary.errlog file. On OpenVMS events are being logged in the SYS\$ERRORLOG:ERRLOG.SYS

Events are then extracted and interpreted by the Compaq Analyze utility.

The Compaq Analyze documentation web page is:

<http://h18023.www1.hp.com/support/svctools/webes/index.html>

See the Smart Array 5300A Release Notes for the information on the supported version of the Compaq Analyze utility.

Error messages displayed while running bios on a controller may be deciphered using Table G-1 in the *Compaq Smart Array 5300 Controller User Guide*.

## Troubleshooting

The troubleshooting techniques described in this section do not identify all possible problems with your Smart Array 5300A controller, however they do cover the most common problems that may typically occur. If a problem is not described, or if the actions suggested does not solve the problem, call your authorized service representative. For problems that might be related to the host, refer to your host system documentation.

**NOTE:** If a significant fault event occurred to your system (i.e. a power hit, a cable pull, etc.) or you suspect something is wrong with your Smart Array 5300A storage subsystem you need to execute the BIOS on each Smart Array controller. If there are POST error conditions present you can use the Appendix G. in the Smart Array 5300 Users Guide for assistance.

The following troubleshooting information is covered in this:

- For system power-on problems see Table 1–3: System Power-On Problems.
- For boot-sequence problems see Table 1–5: Boot Sequence Problems.

**Table 1–3: System Power-On Problems**

Symptom	Probable Cause	Corrective Action
Controller is not detected at the system console		Ensure 'hot plug' latches (fig. 1-2 item 7 are secure and LEDs are On
The Alpha system power-on self test halts with an error message or an error summary appears on the console terminal.	The system detected an error while running the self-test.	Make sure the SA 5304/5302 controller and the system boards are firmly seated in their respective connectors. Check all connections to external devices.  Record the error message or error summary and call your authorized service representative.

**Table 1–4: Alpha SRM Console/ORCA Utility Problems**

Symptom	Probable Cause	Corrective Action
When working within ORCA (Option ROM Configuration for Arrays), pressing the space bar at the initial configuration menu may cause the utility to hang	Console timing issue	To recover from this situation you need to reset or power-cycle the system
The console device list is not updated after running the ORCA BIOS emulator.	The console device list that exists prior to invoking ORCA remains after ORCA is run.	The INIT command has to be executed at the console prompt to get the device list updated.

**Table 1–5: Boot Sequence Problems**

Symptom	Probable Cause	Corrective Action
Boot failure.	Incorrect boot device was specified.	Redefine the default boot device. Refer to your system's reference guide for specific environmental parameter settings.
	Bootbios console variable is not set properly	Set the bootbios variable to point to the desired SA5300A boot controller
	Cable is not properly connected to the SA5304A/5302A controller.	Secure both ends of the SCSI cable
	SA5304A/5302A controller is in an unknown state.	Reboot your system to initialize the SA5304A/5302A controller.
	Incorrect console version.	Upgrade the console to the minimum version specified in the SA5300A Release Notes

**Table 1–5: Boot Sequence Problems (Continued)**

Symptom	Probable Cause	Corrective Action
Devices are not recognized during boot.	Devices are not properly terminated.	Ensure each end of the SCSI bus is terminated.
	Bootbios console variable is not set properly	Set the bootbios variable to point to the desired SA5300A controller
	Operating system is not configured correctly.	Reconfigure system software. Refer to your system's reference guide.
	Operating system does not contain the device driver or the driver not installed correctly.	Make sure that the operating system revision level supports the SA5304/5302 controller.
	Your configuration has been changed.	Boot generic kernel and rebuilt the custom kernel.

**Table 1–6: On-line utilites related problems**

Symptom	Probable Cause	Corrective Action
Certain physical drives may be shown as "degraded" via SNMP agent while the same drives are still shown as "optimal" via ACU-XE utility	A soft error threshold is reached	These devices should be replaced
After invoking the ACU-XE daemon via "cpqacuxe -R" command the ACU-XE icon within the Compaq Web Management does not appear immediately	ACU-XE infrastructure related issue	You have to wait for up to several minutes for this application to become available





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