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Smart Array 6400A Backplane RAID Controller Release Notes

February 2006

AV-RWN7A-TE

These release notes provide supplemental and updated information for the SA6400A RAID controller product not available elsewhere.

SA6400A controllers are modular in design and are shipped in one of two product configurations for use in supported AlphaServer systems. The 3X-KZPEC-BF (SA6402A) is a single controller with two Ultra320 SCSI channels with 128 MB of installed cache. The 3X-KZPEC-DG (SA6404A) provides two controllers each with two Ultra320 SCSI channels with a 256 MB cache, which is shared by the two controllers. The SA6402A and the SA6404A are 133Mhz PCI-X adapters which use a single PCI slot.

Note: *Review the product documentation and check the SA6400A product web site for updates before installing these controllers into your AlphaServer system.*

The SA6400A controller product web page is located at:

<http://h18002.www1.hp.com/alphaserver/products/storage/sa6400a>

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Intended Audience

This document is intended for customers who install, use, or troubleshoot the KZPEC SmartArray 6400A controller product in AlphaServer systems. It describes KZPEC product updates and known issues or restrictions when using the controller within particular system configurations.

KZPEC Product Updates

This is initial release of the SA6400A.

KZPEC Product Components

Controller Firmware Support

The V2.58 firmware image is available on the V7.1 AlphaServer Firmware CD in the OPTIONS subdirectory or from the AlphaServer Firmware web site:

<http://ftp.digital.com/pub/DEC/Alpha/firmware/index.html>

The following example shows how to update controller instance PYA0 with the V2.58 image after booting the V7.1 Alpha Firmware CD in CD-ROM device DQA0 on any supported AlphaServer system:

```
UPD> update pya0 -p  
iso9660:[OPTIONS]kzpec258.sys/dqa0
```

AlphaServer System Firmware Support

HP recommends that all AlphaServer system environments hosting the KZPEC product be updated using SRM firmware from the V7.1 (or later) AlphaServer Firmware CD release. The V7.1 release firmware for AlphaServer systems is downloadable from the

following location:

<http://ftp.digital.com/pub/DEC/Alpha/firmware/>

Operating System Support

SA6400A controllers can be configured for operation in version 7.3-2 or version 8.2 of the OpenVMS operating system, but are not supported by the Tru64 UNIX operating system.

The SA6400A controller can be used as the system boot controller or as a data-only array controller in supported standalone and clustered operating system environments. Installation requirements vary, depending on the system environment under consideration when the SA6400A controller is first installed.

Support for the KZPEC controller is present in the base OpenVMS V7.3-2 and OpenVMS V8.2 releases. OpenVMS V7.3-2 introduces Fastpath support in the Smart Array controller driver (PKRdriver). Consult the OpenVMS V7.3-2 *Operating System Release Notes* and *New Features* documentation for more information. The following OpenVMS software kits and patch updates are the minimum required for SA6400A controller installations:

- OpenVMS Version 7.3-2 with the following TIMA kits:
 - DEC-AXPVMS-VMS732_FIBRE_SCSI-V0700
 - DEC-AXPVMS-VMS732_CPU27F-V0100
- OpenVMS Version 8.2 with the following TIMA kit:
 - DEC-AXPVMS-VMS82A_FIBRE_SCSI-V0100

OpenVMS patches can be downloaded from the following web location:

http://h71000.www7.hp.com/serv_support.html

Runtime Utility Support

Web based utilities are provided for monitoring and configuring the

SA6400A controller and attached storage under OpenVMS. The monitoring function is made available as part of the HP Insight Management (IM) Agents kit for OpenVMS.

Online controller array configuration and maintenance functions are provided using the SA6400A Array Configuration Utility for Smart Array Controllers (ACU-XE). The ACU-XE utility is installed separately from HP Insight Management Agents kit. The ACU-XE utility requires the facilities provided by the Management Agent kit.

http://h71000.www7.hp.com/openvms/products/mgmt_agents/

If you have Smart Array 5300A controller hardware present in your system environment, you may need to update the ACU-XE to a version compatible with this Management Agent kit.

You can obtain install and upgrade the ACU-XE by following the instruction provided after launching the ACUXE_CLEANUP.COM script provided in the ACU-XE utilities kit. The updated ACU-XE utility and supporting documentation from the AlphaServer Smart Array controller web page located at:

http://h18002.www1.hp.com/alphaserver/products/storage/sa6400a/sa6400a_tech.html

OpenVMS Utility Components

General Note

For mixed Smart Array 5300A and 6400A environments, prior version agents and utilities must be updated to the minimum supported 6400A agents and utilities. Refer to the *Smart Array 5300A Backplane Raid Controllers Release Notes* for previous 5300A configuration guidelines prior to installing the updated management agents software.

HP Insight Management Agents for OpenVMS

The V3.3 release of the HP Insight Management Agents for OpenVMS provides full Smart Array utility support for the KZPEC controller under OpenVMS versions 7.3-2 and 8.2. This kit must be used in conjunction with ACU-XE utility kit version V0640-11p08 or later.

The V3.3 kit is available from the HP Insight Management Agents for

OpenVMS web page located at:

http://h71000.www7.hp.com/openvms/products/mgmt_agents/

Download the following HP Insight Management Agents Version 3.3 for OpenVMS Version 8.2 on Alpha:

```
HP-AXPVMS-V82_MGMTAGENTS-V0303-1-1.EXE
```

Download the following HP Insight Management Agents Version 3.3 for OpenVMS Version 7.3-2 on Alpha:

```
HP-AXPVMS-V73_MGMTAGENTS-V0303-1-1.EXE
```

The Insight Management Agents and Patch kits are provided as compressed EXE files. To expand the kits, enter one of the following commands:

- For OpenVMS 8.2 on Alpha:

```
$ RUN HP-AXPVMS-V82_MGMTAGENTS-V0303-1-1.EXE
```

- For OpenVMS 7.3-2 on Alpha:

```
$ RUN HP-AXPVMS-V73_MGMTAGENTS-V0303-1-1.EXE
```

You are strongly advised to review the instructions in the V3.3 kit Installation Guide before attempting to update system/cluster environments that have or have had a V3.02 or pre-V3.02 Management Agent kit installed. Failure to adhere to the guidance with respect to ensuring no WBEM or CPQ\$ACUXE processes are running within the system or OpenVMS cluster environment can result in incomplete Management Agent kit component delivery.

Refer to the Management Agent Kit documentation for software prerequisites and other system requirements prior to installing the Management Agents.

Array Configuration Utility XE for OpenVMS

The V0640-11p08 release of the Smart Array Configuration Utility XE is fully compatible with the HP Insight Management Agents for OpenVMS beginning with Agent kit version 3.3. The following items pertain to the ACU-XE:

- Upgrade to the V0640 ACU-XE from the B0126 or B0105 ACU-XE by utilizing the `ACUXE_CLEANUP.COM` script.

Note: *The B0126 and B0105 ACU-XE are not supported by the SA6400A controller.*

- Installation of the V0640 ACU-XE kit should be performed after first installing or updating the system or cluster environment with the V3.3 (or later) Management Agents kit.
- Users installing the V0640 kit into a system or cluster environment that has or has had the ACU-XE kit previously installed must use the `ACUXE_CLEANUP.COM` installation support script to perform the utility installation. This script will ensure that pre-installation conditions are appropriate before kit component delivery is initiated and prepare the system and cluster environment for cluster-wide installation of the kit.

The `ACUXE_CLEANUP.COM` script is packaged as part of the self-extracting archive containing the V0640 ACU-XE PCSI kit and is available from the Smart Array 6400A web site.

After downloading the V0640 kit distribution file and placing it in `SYS$UPDATE`, run the `.EXE` file to extract the V0640 PCSI kit and the accompanying `ACUXE_CLEANUP.COM` script.

- Install and upgrade the ACU-XE utility by following the instruction provided after launching the ACUXE_CLEANUP.COM script as follows:

```
$ @SYS$UPDATE:ACUXE_CLEANUP.COM
```

ACU-XE Scripting Support

Starting with V6.40 the ACU-XE on OpenVMS provides support for scripting. Using ACU-XE scripting the user can capture a SmartArray configuration or create a new configuration using a script file instead of the ACU-XE web interface. The command line syntax for ACU-XE scripting is:

```
$ @SYS$SYSROOT:[WBEM.ACUXE]CPQ$ACUXE [option] [filename]
```

Options: (use one only)

- c Capture configuration to a script file.
(Default file is ACUCAPT.INI.)
- i Input configuration from a script file.
(Default file is ACUINPUT.INI)

Any errors encountered during a script command will be logged in a file called ERROR.INI that the ACU-XE will create in the current working directory. After executing a script command be sure to check if an ERROR.INI file has been created and review the file to determine what if any error's occurred.

For details on ACU-XE script file syntax refer to the HP Array Configuration Users Guide.

In addition to the -c and -i scripting options, the following -cli show option is available:

```
$ @SYS$SYSROOT:[WBEM.ACUXE]CPQ$ACUXE [option]
```

Options:

- cli show Show the storage systems current configuration.

The following list describes features and restrictions of OpenVMS ACU-XE scripting and CLI:

- The `show` command is the only command supported by CLI.
- To identify a controller in a script, use the following syntax:

```
Controller= Rad X ,Hose Y ,Slot Z ,Device Name PKXX
```

In this syntax, the values `X`, `Y`, `Z` identify the Rad, Hose, and Slot numbers of the controller and `PKXX` identifies the device name. The Rad, Hose, Slot, and Device Name values for a specific controller can be found with the Management Agents.

You can also use `Controller= All` for a script command that will be applied to all controllers

- The following script options are not supported:
 - `LicenseKey`
 - `DeleteLicenseKey`
 - `RAIDArrayID`
 - `SSPState`
 - `LogicalDriveSSPState`
 - `SSPAdaptersWithAccess`
- The basic scripting syntax is `Option= Value`. For the Action and Method options, ensure there is no space between the option and the equal (=) sign. For example, use `Action= Configure` not `Action = Configure`.

Web Browser Support

Consult the Release Notes for the Insight Management kit you have installed for supported WEB browsers and known browser issues.

KZPEC Event Translation Support

WEBES kit version 4.4.2 or later provides KZPEC event translation of OpenVMS system error logs. The System Event Analyzer (formerly known as Compaq Analyze), is the WEBES component that permits translation of KZPEC controller events.

WEBES kits are available from the following web site:

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

Supported HP AlphaServer Systems

SA6400A controllers are supported on the following AlphaServer systems:

- DS15
- DS25
- ES45
- ES47, ES80, GS1280

KZPEC Product Issues and Restrictions

Platform Specific Issues and Restrictions

Consult the QuickSpec for the AlphaServer system on which the KZPEC controller will be installed for numbers of controllers supported and other platform specific information.

ES47, ES80 and GS1280 System Issues

- KZPEC controller placement and configuration in model ES47, ES80, and GS1280 systems is governed by the guidelines included in the associated platform QuickSpec.
- The SRM console environment variable `heap_expand` does not exist on ES47, ES80, and GS1280 platforms. Customers may disregard any requirement to set this variable when the KZPEC product is installed on these system types.

AlphaServer System Firmware Issues and Restrictions

SA6400A logical volumes configured as operating system dump devices must be resident on the KZPEC controller which is specified

by the bootbios console environment variable.

OpenVMS Issues and Restrictions

SA6400A volumes are not supported in a shared SCSI bus storage configuration.

Runtime Utility Issues and Restrictions

The following items are known issues with the online utilities provided with SA6400A controllers.

- Resizing (dragging the border of) the Netscape "HP Array Configuration Utility XE" window, causes the ACU-XE session to end. A new session of ACU-XE will have to be started.
- The GIF shown for an Array with a degraded Logical volume is the same as a GIF for an Array with a failed Logical volume.
- Critical errors on the SA6400A controllers are accompanied by red status messages within the Array Configuration Utility. The last statement in each of these messages, "For more information, run the Array Diagnostics Utility.", should be disregarded. Use the System Event Analyzer to obtain further information about the reported errors.
- When a condition occurs, such as a hardware fault, there may be data that needs to be flushed from cache. To perform the cache flush, run the BIOS from the SRM console on the affected controller.
- The ACU-XE can use valuable system resources and should not be left running when not in use. Users are encouraged to only start the ACU-XE when required and shut it down once any configuration changes are completed.
- WSEA V4.4.2 provides limited and missing state information in its bit to text decode of SA6400A events and will identify the SA6400A controller as a SA5300A controller. Translation improvements will be available by installing later revisions of this tool.
- When exiting graphics mode of the ADFU utility on ES47, ES80 and GS1280 systems with the console environment variable "set

console graphics” enabled, "USB 302" errors will be displayed on the graphics console. These are benign and can be removed by issuing a reset at the MBM prompt. For example:

```
<esc><esc>MBM  
MBM> reset
```

You can avoid seeing these errors by booting the ADFU in graphics mode (b -fl 0) with the console environment variable “set console serial” enabled.

- If any of the following disk drive types with firmware revision HPB3 or lower are configured in an MSA30 connected to a SA6400A controller, the ADFU will be unable to update these drives. This issue does not affect SA5300A, drives installed in a DS-SL13R Ultra160 enclosure, or SCSI2 backplane, or these disk drives with firmware revisions above HPB3.

To update drive firmware that is at or below HPB3, use one of the following procedures:

- Move drives to an Ultra160 or SCSI2 disk shelf
- Move shelf or drives to a SA5300A
- Move shelf or drives to a Proliant system

The disk drives with this firmware issue are limited to the following:

- BD03685A24
- BD07285A25
- BD14685A26
- BF01885A34
- BF03685A35
- BF07285A36
- The first CDROM drive (DQA0) must be used to boot the ADFU in systems with multiple CDROM drives.
- When booting the ADFU on an AlphaServer ES47, ES80, or GS1280 system, a number of errors are logged to the MBM log

and to the console terminal. These non-fatal errors only occur if one or more of the SA6400A controllers are running in PCI-X mode. These errors are expected behavior.

- With the ACU-XE utility, make sure to create and SAVE at least one logical volume within any newly created array before continuing to create more arrays. Always follow these three basic steps:
 1. create array
 2. create volume
 3. save
- After configuring volumes under ACU-XE, sometimes the volumes do not become available under OpenVMS. If the configured volume under ACU-XE is not found by OpenVMS, issuing the following command will make the volume available:

```
$MC SYSMAN IO AUTO/LOG
```

Firmware Issues and Restrictions

- The maximum possible number of logical drives that can be configured on a SA6400A controller is 32.
- Logical volume capacity extension is not supported.
- The maximum array size supported by the controller and OpenVMS is 2 TB.
- The maximum Logical Volume size supported by the controller is 2 TB.
- The maximum Logical Volume size currently supported by OpenVMS is 1 TB.
- If a Hot Spare has replaced a failed physical drive within a redundant array, the ACU-XE may show a logical volume having another volume below with "???" as the spare capacity. Replacing the failed drive will cause the array to return to the original configuration.
- In the event of a SCSI bus failure, all logical devices on this bus might become failed. There is a way these devices can be made

available to the user (data integrity cannot be guaranteed, however). You have to shut down your AlphaServer and run BIOS on the controller housing these devices. For example:

```
>>run bios pya0
```

You will be presented with a choice of either recovering (making optimal) these devices or leaving them in the failed state. There is no default option under this scenario, and mandatory user intervention is required.

Storage Enclosure Issues and Restrictions

- Follow the power sequencing rules that follow to avoid possible array volume state changes affecting the availability of user data:
 - When removing power to a storage enclosure attached to a Smart Array controller, first remove power to the host system, followed by powering off the storage enclosure.
 - When powering a system on, ensure all storage enclosures attached to a Smart Array controller first receive power before applying power to the host system.
- The BA610-6D internal disk cages are only supported with SCSI environmental module (Nile) logic cards P/N 3R-A1629-AA/010615-001 of rev. 0B. Cards with P/N 3R-A1629-AA/010615-001 of rev. 0A are not supported with SA6400A controllers. Customers with BA610-6D modules with logic cards of P/N 3R-A1629-AA/010615-001 of rev. 0A and want to utilize RAID functionality must contact HP Field Service to have the 3R-A1629-AA/010615-001 rev. 0A cards upgraded.
- When configuring a SA6400A controller attached to a storage enclosure configured with a dual bus I/O module, each of the enclosure's SCSI bus segments may be attached to a Smart Array controller instance. Connecting a controller or adapter other than another Smart Array controller to the second SCSI bus segment of the enclosure is unsupported.

If a SA6400A controller loses communication with a storage enclosure, then all physical drives in this enclosure are seen via

SNMP Agent as located in an enclosure Bay 255. This typically means there is a hardware problem with the enclosure. Contact HP Services for the enclosure troubleshooting.

Hardware and Connection Details

- All supported external enclosures ship with Ultra3 SCSI compliant cables. See the QuickSpec for your HP StorageWorks storage enclosure for the list of supported cables.
- The model 4254 P/N 138151-001 (DS-SSL14-RS) contains an Ultra2 capable I/O module, which is dual bus only.
- The model 4354 P/N 190211-001 (DS-SL13R-BA) contains an Ultra3 capable I/O module, which is dual bus only.
- The model 4214 P/N 103381-001 (DS-SSL14-RM) contains an Ultra2 capable I/O module, which is single bus only.
- The model 4314 P/N 190209-001 (DS-SL13R-AA) contains an Ultra3 capable I/O module, which is a single bus only.
- The model MSA30 S-B P/N 3R-A4075-AA contains an Ultra320 capable I/O module, which is a single bus only.
- The model MSA30 D-B P/N 3R-A4076-AA contains an Ultra320 capable I/O module, which is a dual bus only.