

## *HP StorageWorks™*

# **Release Notes for KZPCC-CE (3-Channel) and KZPCC-AC (1-Channel) Backplane RAID Controllers**

These release notes contain the most recent supplemental information for the HP StorageWorks KZPCC-CE and KZPCC-AC backplane RAID controllers. Both controllers belong to the same controller family, commonly referred to as KZPCC controllers. The KZPCC-CE is a three-channel controller. The KZPCC-AC is a one-channel controller.

**Be sure to read these notes and check the KZPCC-CE and KZPCC-AC World Wide WEB sites for the latest updates before installing these controllers into your server.**

The KZPCC-CE controller WEB site:

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

The KZPCC-AC controller WEB site:

[http://h18002.www1.hp.com/alphaserver/products/storage/kzpcc\\_ac.html](http://h18002.www1.hp.com/alphaserver/products/storage/kzpcc_ac.html)

The following software versions and updates are needed for the KZPCC-CE or KZPCC-AC support:

**Firmware revision: CQ16**

- HP Tru64 UNIX operating system version V4.0f with the New Hardware Delivery –3 kit (NHD 3) or later or HP Tru64 UNIX operating system version V4.0G

The New Hardware Delivery –3 kit (NHD 3) is listed on the World Wide Web as:

nhd3.tar.gz Tru64 UNIX V4.0F New Hardware Support

The Web page is:

[http://ftp.service.digital.com/public/Digital\\_UNIX/v4.0f/](http://ftp.service.digital.com/public/Digital_UNIX/v4.0f/)

The optional Tru64 UNIX V4.0F Patch Kit 6 or later, required for the on-line diskconfig utility support is listed on the World Wide Web as:

duv40fas0006-2001mmdd.tar where mmdd are the calendar month and day when the patch kit is created

The Web page is:

[http://ftp.service.digital.com/public/Digital\\_UNIX/v4.0f/](http://ftp.service.digital.com/public/Digital_UNIX/v4.0f/)

The optional Tru64 UNIX V4.0G Patch Kit 3 or later, required for the on-line diskconfig utility support is listed on the World Wide Web as:

T64v40gas0003-2001mmdd.tar

The Web page is:

[http://ftp.service.digital.com/public/Digital\\_UNIX/v4.0g/](http://ftp.service.digital.com/public/Digital_UNIX/v4.0g/)

- HP Tru64 UNIX operating system version V5.1 with the Patch Kit 4 or later.

Patch Kit 4 or later is mandatory for supporting the KZPCC-CE and KZPCC-AC controllers on the Tru64 UNIX V5.1

The Patch Kit 4 is listed on the World Wide Web as:

t64v51b18as0004-20011114.tar

The web page is:

[http://ftp.service.digital.com/public/Digital\\_UNIX/v5.1/](http://ftp.service.digital.com/public/Digital_UNIX/v5.1/)

- HP Tru64 UNIX operating system version V5.1A

HP Tru64 UNIX TCR 5.1A support requires the Patch Kit 1 or later which is listed on the World Wide Web as:

t64v51ab01as0001-2002mmdd.tar

The web page is:

[http://ftp.service.digital.com/public/Digital\\_UNIX/v5.1a/](http://ftp.service.digital.com/public/Digital_UNIX/v5.1a/)

- HP Tru64 UNIX operating system version V5.1B

Storage Works Command Console (SWCC) kit version V2.3 is shipped on a CD-ROM with the controller.

For support on the Tru64 UNIX V5.1B Operating System a new V2.31 KZPCC SWCC kit is required. This kit is listed on the Web as:

SWCC for KZPCC V2.31

The Web page is:

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

Note: The SWCC for KZPCC V2.3 or V2.31 should not be installed on Tru64 UNIX V5.1 unless the Patch Kit 4 or later is applied to the system.

- Alpha Console Firmware standing web page is:  
<http://ftp.digital.com/pub/Digital/Alpha/firmware>
- Compaq Analyze Version V3.1& 4.0 and DecEvent Version V3.3 are used for KZPCC-CE and KZPCC-AC Event logging.

The Compaq Analyze is listed on the World Wide Web as:  
WEBES V4.0

The Web page for the documentation is:  
<http://www.support.compaq.com/svctools/webes/>

The DECEvent supported on Alpha Servers 800 is listed on the World Wide Web as  
DECEvent V3.3.

The Web page for the kit and documentation is:  
<http://www.support.compaq.com/svctools/decevent/index.html>

## Introduction

The KZPCC-CE and KZPCC-AC controllers are high-performance, 64-bit PCI to Ultra2/LVD backplane controllers for use with the HP StorageWorks enclosures 4200 (model 4254), 4300 (models 4354 and 4314), HP BA356 UltraSCSI storage enclosures with the DS-BA35X-FC DOC2 I/O modules and BA610-6D internal disk cages.

This document describes any known restrictions or issues when using the controller within your system configuration, and has the following sections:

- Parts lists for the HP StorageWorks KZPCC-CE and KZPCC-AC
- Replacement Parts
- Supported HP servers
- Supported operating systems
- Verified device listing
- Restrictions and issues
- Example configurations for the KZPCC-CE and KZPCC-AC controllers

## Parts Lists

**Table 1**  
**HP StorageWorks KZPCC-CE Parts List**

<b>Part Number</b>	<b>Revision</b>	<b>Description</b>
<b>(Digital Classic)</b>		
DS-KZPCC-XE	C	Three-Channel, 64-bit PCI to Ultra2/LVD backplane RAID controller with 64MB cache and battery backup
AA-RKL7C-TE	C	Release notes for the KZPCC-CE and KZPCC-AC (this document)
AA-RKL6B-TE	B	HP StorageWorks KZPCC-CE User Guide
179525-021	C01	Warranty
215918-001	B01	Worldwide Telephone Directory
QB-66KAA-SA	C	SWCCKZPCC-CE ALL LIC/CDRM PKG
QA-66KAA-GZ	C	SWCCKZPCC-CE ALL DOC KIT (included with QB-66KAA-SA)
QM-66KAA-AA	A	SWCCKZPCC-CE ALL SYS 1 LIC (included with QB-66KAA-SA)

**Table 2**  
**HP StorageWorks KZPCC-AC Parts List**

Part Number	Revision	Description
<b>(Digital Classic)</b>		
DS-KZPCC-XC	C	Single-channel, 64-bit PCI to Ultra2/LVD backplane RAID controller with 16MB cache and battery backup
AA-RKL7C-TE	C	Release notes for the KZPCC-CE and KZPCC-AC (this document)
AA-RKL6B-TE	B	HP StorageWorks KZPCC-CE User Guide
179525-021	C01	Warranty
215918-001	B01	Worldwide Telephone Directory
QB-66KAA-SA	C	SWCCKZPCC-CE ALL LIC/CDRM PKG
QA-66KAA-GZ	C	SWCCKZPCC-CE ALL DOC KIT (included with QB-66KAA-SA)
QM-66KAA-AA	A	SWCCKZPCC-CE ALL SYS 1 LIC (included with QB-66KAA-SA)

## Replacement Parts

**Table 3**  
**KZPCC-CE Replacement Parts**

Part Number	Description
DS-MS100-DE	64MB DIMM
DS-KZPCC-UB	Battery replacement kit

**Table 4**  
**KZPCC-AC Replacement Parts**

Part Number	Description
DS-MS100-DC	16MB DIMM
DS-KZPCC-UB	Battery replacement kit

## Supported HP Servers

The HP StorageWorks KZPCC-CE and KZPCC-AC are supported on the servers listed in Table 5.

**Table 5**  
**Supported HP AlphaServers**

AlphaServer	Maximum Number of Supported Controllers
DS10	2
ES40	8
GS80	8
GS160	8

*continued*

**Table 5**  
**Supported HP AlphaServers** *continued*

AlphaServer	Maximum Number of Supported Controllers
GS320	8
XP1000	1
XP900	2
AS800	1
DS20E	2
ES45	8

- On AS800 platform KZPCC-CE/KZPCC-AC devices are supported as data devices only, no boot support is available.
- AS800 platforms are not supported past the Alpha SRM V5.8 console stream.
- For ES45 platforms the minimum supported SRM console version is V5.9-10
- On XP1000 platform the KZPCC-CE/KZPCC-AC boards are only supported in the single PCI0 64-bit Slot 3 location.
- The Tru64 UNIX V4.0F and V4.0G operating system is not supported on GS80/GS160/GS320 system platforms with KZPCC-CE controllers.

## Supported Operating Systems

The KZPCC-CE and KZPCC-AC are supported on HP Tru64 UNIX V4.0F operating system with New Hardware Delivery (NHD) -3 Kit, the Tru64 UNIX V4.0G operating system, Tru64 UNIX V5.1 operating system with the mandatory Patch Kit 4, Tru64 UNIX V5.1A operating system and Tru64 UNIX V5.1B.

For TruCluster support with Unix V5.1A (TCR 5.1A), the Patch Kit 1 or later is required.

The Tru64 UNIX V4.0F Patch kit 6 or later and V4.0G Patch Kit 3 or later are options needed for the runtime diskconfig utility support.

These Patch Kits contain some important improvements for the Tru64 UNIX V4.0F & V4.0G Operating Systems which will help to optimize the operation



of your KZPCC-CE and KZPCC-AC controllers so we recommend all our customers to use them.

Table 6 lists the minimum supported versions of the hardware and software components for the KZPCC-CE and KZPCC-AC products as required for the three currently supported Operating Systems.

**Table 6**  
**Minimum Supported Hardware/Software for KZPCC-CE and KZPCC-AC Controllers for Tru64 V4.0F, V4.0G, V5.1, V5.1A and V5.1B**

	V4.0F	V4.0G	V5.1 with PK4	V5.1A	V5.1B	BA610-6D enclosures
Hardware	B01* A01**	C01	C01	D01	D01	D01
Firmware	CQZ2	CQZ2	CQZ2	CQ16	CQ16	CQ16
SMOR	Smor 0021.111	Smor 0033.112	Smor 0033.112	Smor 0033.112	Smor 0033.112	Smor 0033.112
SWCC	V2.2	V2.3	V2.3	V2.3	V2.31	V2.3
SRM console	V5.7	V5.8***	V5.8***	V6.0	V6.0	V6.0

\* KZPCC-CE controller

\*\* KZPCC-AC controller

\*\*\* V6.0 SRM console revision is recommended on all supported system platforms; V6.0 SRM console revision is the minimum supported version on the GS80/GS160/GS320 system platforms.

**Table 7**  
**Supported Alpha Servers and Operating Systems**

Alpha Server	Tru64 UNIX version	Order No.
DS10	V4.0F, V4.0G, V5.1, V5.1A, V5.1B	DA-PB10A-XX, DA-73BAA-XX

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ES40	V4.0F, V4.0G	DA-64AAA-XX, DA-64BAA-XX
	V5.1, V5.1A, V5.1B	See below*
GS80	V5.1, V5.1A, V5.1B	DA-A80XA-XX, DA-A80XE-XX

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*continued*

**Table 7**  
**Supported Alpha Servers and Operating Systems** *continued*

Alpha Server	Tru64 UNIX version	Order No.
GS160	V5.1, V5.1A, V5.1B	DA-160XA-XX, DA-160XE-XX
GS320	V5.1, V5.1A, V5.1B	DA-320XA-XX, DA-320XE-XX
XP1000	V4.0F, V4.0G, V5.1, V5.1A, V5.1B	SN-E2G6W-32
XP900	V4.0F, V4.0G, V5.1, V5.1A, V5.1B	SN-DB10W-A3
AS800	V4.0F, V4.0G, V5.1, V5.1A, V5.1B	21164 333, 400 & 500-MHz CPU versions
DS20E	V4.0F, V4.0G, V5.1, V5.1A, V5.1B	DA-56PAB-XX, DA-56RAA-XX
ES45	V5.1A , V5.1B**	DA-68DAA-XX

\* The ES40 EV67 and EV68 CPU based systems with the KZPCC-CE/-AC controllers are supported with Unix V5.1& V5.1A with the following CPUs:

EV67	Pass 2.5 (500 MHz)	54-30158-B3/B5	Rev. A01
	Pass 2.5 (667 MHz)	54-30362-01	Rev. C01
EV67	Pass 2.6 (500 MHz)	54-30158-B3/B5	Rev. B01
	Pass 2.6 (667 MHz)	54-30362-01	Rev. D01
EV68	Pass 2.1 (833 MHz)	54-30362-B3	Rev. B01 (and above)
	Pass 2.2 (833 MHz)	54-30362-B3	Rev. C01 (and above)

\*\* ES45 platforms are only supported with Tru64 UNIX V5.1A plus a mandatory Patch Kit 1 or later or V5.1B.

## Supported Devices

For a listing of the SCSI devices (disk drives) supported by the KZPCC-CE and KZPCC-AC in 4254 , 4354, 4314, and BA610-6D enclosures see Table 8. For listing of the devices supported in the BA356 enclosures see Table 9.

**Table 8**  
**Supported Devices for HP StorageWorks Models 4254, 4354, 4314 and BA610-6D Enclosures**

Type	Capacity	Speed (RPM)	Part Number
Ultra2/LVD	18.2 GB	10,000	128418-B22 / 3R-A0561-AA
Ultra2/LVD	18.2 GB	7,200	388144-B22 / 3R-A0527-AA
Ultra2/LVD	9.1 GB	10,000	328939-B22 / 3R-A0526-AA
Ultra2/LVD	9.1 GB	7,200	123065-B22 / 3R-A0525-AA

*continued*

**Table 8**  
**Supported Devices for HP StorageWorks Models 4254, 4354, 4314**  
**and BA610-6D Enclosures** *continued*

Type	Capacity	Speed (RPM)	Part Number
Ultra3/Ultra2 Capable	72 GB	10,000	232432-B22 / 3R-A3050-AA
Ultra3/Ultra2 Capable	72 GB	10,000	260755-002
Ultra3/Ultra2 Capable	72 GB	10,000	233806-004 / 3R-A3137-AA
Ultra3/Ultra2 Capable	36 GB	10,000	176496-B22 / 3R-A0919-AA
Ultra3/Ultra2 Capable	36 GB	15,000	235065-002
Ultra3/Ultra2 Capable	36 GB	15,000	251872-002
Ultra3/Ultra2 Capable	36 GB	10,000	260755-002
Ultra3/Ultra2 Capable	36 GB	10,000	233806-003 / 3R-A3136-AA
Ultra3/Ultra2 Capable	36 GB	10,000	232574-002 / 3R-A3059-AA
Ultra3/Ultra2 Capable	18 GB	15,000	188122-B22 / 3R-A1543-AA
Ultra3/Ultra2 Capable	18 GB	15,000	235065-001
Ultra3/Ultra2 Capable	18 GB	15,000	251872-001
Ultra3/Ultra2 Capable	18 GB	10,000	142673-B22 / 3R-A0585-AA

**Table 8**  
**Supported Devices for HP StorageWorks Models 4254, 4354, 4314**  
**and BA610-6D Enclosures** *continued*

Type	Capacity	Speed (RPM)	Part Number
Ultra3/Ultra2 Capable	18 GB	10,000	233806-002 / 3R-A3135-AA
Ultra3/Ultra2 Capable	18 GB	10,000	232574-001 / 3R-A3058-AA
Ultra3/Ultra2 Capable	9 GB	15,000	188120-B22 / 3R-A1542-AA
Ultra3/Ultra2 Capable	9 GB	10,000	142671-B22 / 3R-A0584-AA

**Table 9**  
**Supported Devices for HP StorageWorks Model BA356**  
**Enclosures**

Type	Capacity	Speed (RPM)	Part Number
Ultra capable	36.4 GB	10K	DS-RZ1FC-VW
Ultra capable	36.4 GB	7.2K	DS-RZ1FB-VW
Ultra capable	18.2 GB	10K	DS-RZ1ED-VW
Ultra capable	18.2 GB	7.2K	DS-RZ1EF-VW
Ultra capable	18.2 GB	7.2K	DS-RZ1EA-VW
Ultra capable	9.1 GB	10K	DS-RZ1DD-VW
Ultra capable	9.1 GB	7.2K	DS-RZ1DA-VW
Ultra capable	9.1 GB	7.2K	DS-RZ1DF-VW

## SMOR Restrictions and Issues

- If the SMOR utility is to be used for initial configuration of newly attached storage enclosures, the device enclosures must be power cycled prior to powering up the server and entering the SMOR utility.
- If a build (activity on selected devices) does not start after selecting Set System Config from the file menu in SMOR (RAID 1, 5, 0+1, 0+5 ONLY); then delete those RAID sets, reboot, enter the SMOR utility, and recreate the RAID sets.
- Ignore the serial number displayed in SMOR's Controller Information Pages and instead use the serial number listed on the label found on the controller board.
- Use only the default Controller Configuration Settings found in SMOR unless otherwise noted.
- A graphics card is required for using SMOR. Or alternatively you can run SMOR via a serial line and terminal simulation software on a pc.
- Save Firmware feature under the Action menu is currently not supported.
- s3trio style video cards may cause SMOR to hang. If this happens, you will have to initiate a system reset by pressing the "Reset" button on your Alpha Server operational panel. If replacing a s3trio video card with a different supported video card is not possible, we recommend you not use SMOR for configuring new devices and use the on-line SWCC utility instead. However you should be able to use SMOR initially for configuring your KZPCC-CE/KZPCC-AC Tru64 UNIX O/S system disk.

## StorageWorks Command Console (SWCC) Restrictions and Issues

- The SWCC KZPCC-CE and KZPCC-AC client/agent utilities must be used for effective management and event log reporting of the KZPCC-CE or KZPCC-AC subsystem.
- SWCC client software must be installed on a personal computer running Windows NT 4.0 or Windows 2000.
- You can find the version of the Agent, on the Agent Management tab of the Agent Configuration Utility. The Client version can be obtained by displaying the Help > About dialog box in the KZPCC Storage window.
- You may notice text about the DMS Client at the end of the installation. Please ignore this information.
- If the Agent determines all of your controllers are unsupported or you have no controllers available, the Agent program will exit.
- The Agent logs events to the syslog daemon using the "user" facility at the "notify" priority. The output of these will be governed by the setup of the /etc/syslog.conf configuration. If the Agent fails to start, check this log to determine the cause.
- Attaching the KZPCC Client to a system without the Agent installed or running results in an error message stating: "The KZPCC client failed to connect to system X, WSAECONNREFUSED: Connection refused"
- The controller has a built-in audible alarm, which is silenced by default. This alarm may be enabled through the use of SWCC client Applet.
- If the Agent has stopped responding, the dialog box displayed while connecting to the Agent will hang. To remove the dialog box, use the Task Manager to end the kzpcc.exe process on the Client system.
- The firmware does not retain the state of devices that are not part of the configuration between reboots. For example, if the Agent system is rebooted while there is a failed device that is not part of the configuration, the Agent will report the device as available.
- Rebuilds are automatically started by SWCC when rebuild operation is initiated on the last failed device, transitioning the logical drive from reduced to rebuilding.



- A failed device that has been replaced by a hot spare will assume the failed state and will not be associated with the array. If the system is subsequently rebooted, the failed device will assume the “available” state. This drive should be treated as a failed device.
- When you replace a failed hotspare with a good device, the firmware will still label the device as “failed.” To be able to use this device, you must force it to an available state.
- If you have one or more rebuilding arrays and decide to create a new logical unit, SWCC may present reconstructing members of the arrays as available. Although presented as available, SWCC will not let you choose those reconstructing drives as members of new arrays.
- During the KZPCCconfig utility startup the old version of the utility is displayed (V2.2-15). This information must be ignored.
- There is a limitation in SWCC for a number of disk drives you can configure in a RAID5: you cannot select more than nine physical drives to create a RAID5 set. This limitation will be fixed in the future release of SWCC software. In the meantime you can use SMOR for creating RAID5 arrays with more than nine members.
- If there is a failed disk drive in RAID50 or RAID10 and you want to swap it with a new one and rebuild the array, you need to be sure to use a disk of equal or larger capacity to the smallest capacity disk in the array. If you try to insert a disk of a smaller capacity than the smallest disk in the array, the virtual disk might appear to rebuild in the SWCC Applet, but the actual rebuild operation does not start.
- When used in Tru64 UNIX clusters the SWCC Agent needs to be installed on one node only. On all other nodes the Agent must be started manually for the first time through the KZPCCconfig utility. If the automatic startup of the Agent is enabled, then the Agent will start automatically during the next system boot.
- If you have the O/S root file system or domain full the SWCC Agent might not start automatically during a reboot. In this case you can start the Agent manually using KZPCCconfig utility.

## Event Logging

- All KZPCC-CE and KZPCC-AC controller events are reported by SWCC and put in the binary.errlog file. Events are then extracted and interpreted by the Compaq Analyze and DECEvent utilities.

Compaq Analyze V3.1, V4.0 and DECEvent V3.3 are the versions that support the KZPCC-CE and KZPCC-AC controllers.

## RAID Restrictions and Issues

- Adding new physical disks to enclosures housing previously configured logical units must only be done when your AlphaServer is powered up and running Tru64 UNIX Operating System. Do not add new disk drives to KZPCC-CE or KZPCC-AC storage arrays having existing configurations when your system is powered down. Failure to observe this restriction can lead to unintended configuration changes causing unrecoverable data loss.
- Rebuilds are started on all failed members of a RAID 0+1 or RAID 0+5 in reduced mode regardless of how that rebuild is started.

In SMOR a rebuild on a logical drive can be started by either selecting rebuild with the logical drive highlighted, or selecting rebuild with the physical drive highlighted. In SWCC a rebuild is started only by selecting a physical drive.

- Stripe size of the RAID 0 portion of a RAID 0 + 1 or RAID 0+5 is governed by the stripe size of the elements that make up the logical drive.

For the RAID 0+5 case, the stripe size can be adjusted based on the stripe size chosen for the RAID 5 base arrays. However, for the RAID 0 + 1 case, the stripe size is a fixed value and cannot be modified. Although SMOR presents a stripe size for the RAID 0 portion, when creating RAID 0 + 1 and RAID 0 + 5, the value is ignored and overwritten by the firmware based on the stripe size of the base arrays.

- RAID sets are immediately available for use following completion of the creation steps, even while the RAIDset is building.

However Tru64 UNIX O/S installations are only supported to fully optimized RAIDsets.

Activity on the RAIDset members may be present in the absence of other I/O activity during the build of certain RAIDset types.

- There are situations when all drives in a RAID 0+5 can incorrectly be marked failed in the SWCC applet. Specifically, when two physical drives in one of the base arrays fail and a write operation is tried to the logical drive, a cache write back failure occurs. If only a small amount of data is written, so that it is wholly contained on one drive only, all drives in the logical unit get marked failed instead of just the two physical drives that actually failed. In this case, to distinguish between the drives which really experienced hard errors and the good remaining drives in the RAID 0+5, the Eventlogs reported in Compaq Analyze must be examined. Only drives which reported Unrecoverable Hard Errors in the SWCC Sense Data events have actually failed.
- If one of the members of a RAID 0+1 or RAID 0+5 fails during a rebuild operation, the logical unit might not change its state to reduced immediately following the drive failure. This happens because the rebuild operation still continues on the remaining base arrays. Eventually the upper-level array (the logical unit) will become reduced after the rebuild operation is finished. At this point you will be able to recover your RAID 0+1 or RAID 0+5 array by selecting the failed drive in the SWCC applet and manually starting the reconstruction process.
- If a drive fails in one base array (A1) of a RAID 0+1 or RAID 0+5 while the other base array (A2) is reconstructing to a new drive (could be an available hot spare) due to a prior failure in that array, the top level-array may be marked as degraded. For this to occur, there must be an available hot spare in the A1, and A2 must be reconstructing. Additionally the reconstructing drive in A2, as well as the available hot spare in A1, will both be marked as failed in SWCC. In this situation you can recover your RAID 0+1 or RAID 0+5 array by selecting one of these failed members (with a right mouse click) and then manually starting the reconstruction process. The RAID 0+1 or RAID 0+5 will start the reconstruction process.
- The smallest member used in the creation of the RAIDset determines the usable logical drive size. When creating hot spares, make sure the drive is at least as big as the smallest drive member.

## Drive Roaming Restrictions

Moving a logical drive configuration existing on a physical device from one point to another on the KZPCC-CE or KZPCC-AC controller is not supported.

If you want to move a physical drive to a different slot within a controller this drive must first be made available (unconfigured) via SWCC or SMOR.

This can be accomplished by placing a physical drive into a supported storage enclosure not housing previously configured logical devices and connected to a KZPCC-CE or KZPCC-AC controller. If there are storage enclosures connected to other available channels of a KZPCC-CE controller these enclosures should not contain previously configured logical devices as well. If a physical device was previously a member of a logical device it might contain some stale RAID configuration data and therefore show up in SWCC or SMOR as a member of a RAID set with some missing members. This drive can be made unconfigured by deleting a logical device associated with it via SWCC or SMOR utility.

Logical drives can be reconstructed from one or more members of a logical drive placed in a different controller. This is useful for moving a logical drive from a failed controller to another controller. This reconstruction feature can not be disabled.

To reconstruct a logical drive when moved from a failed controller to a new controller:

1. Power down the system with the failed controller.
2. Remove drives - members of the logical drive.
3. Place drives in a storage enclosure connected to a KZPCC-CE or KZPCC-AC controller on a different system (must be powered down too) using the same storage enclosure slot numbers as in the original enclosure or leave the drives in place and replace the failed controller with a new one.
4. Power up the system. You will be able to access your data after you boot the operating system.

**NOTE:** When adding a disk drive off a shelf to a KZPCC-CE or KZPCC-AC controller on-line (system powered up) it is possible that some previous logical drive configuration data may be resident on the disk. If so the controller may present via SWCC partial or whole RAID arrays derived from that configuration information. In this case you must use SWCC to delete the configuration information on the drive and put the drive to available state.

## Device Shelf Restrictions and Issues

- The on-line LED on the disk drive housing should be ignored when used in the Model 4254, 4354 or model 4314 device shelf.
- The BA610-6D internal disk cages are only supported with Nile logic cards P/N 3R-A1629-AA/010615-001 of rev 0B. 3R-A1629-AA/010615-001 cards of rev. 0A are not supported with KZPCC-CE/-AC controllers. Customers who own BA610-6D modules with 3R-A1629-AA/010615-001 logic cards of rev. 0A and want to take advantage of internal RAID must contact HP Field Service to have their 3R-A1629-AA/010615-001 cards replaced.
- If you are using KZPCC-CE or -AC controllers with the Models 4254 and 4354 enclosures there is no support for using one of the enclosure channels to connect to a controller or adapter other than KZPCC-CE or -AC if you already have a KZPCC-CE or -AC controller connected to the other channel.

## HP Tru64 UNIX Restrictions and Issues

- Virtual-disk device naming under HP Tru64 UNIX:

For the Tru64 UNIX 4.0F and 4.0G versions the format of the device name for a KZPCC-CE or KZPCC-AC virtual disk is:

/dev/riNNN[a-h]      for the block special devices

and

/dev/rriNNN[a-h] for the character special devices

where NNN is the device number. The 4.0x stream UNIX kernel assigns device numbers as follows: device numbers 0 through 127 are assigned to the first controller (in the system scan order); 128 through 255 to the second, and so forth. Whenever a new virtual disk is recognized by the UNIX kernel, it is assigned the lowest unused device number in that controller's range.

For the Tru64 UNIX 5.1 version the format of the device name for a KZPCC-CE or KZPCC-AC virtual disk is:

/dev/disk/dskNNN[a-h]for the block special devices

and

/dev/rdisk/dskNNN[a-h] for the character special devices

where NNN is the device number. The 5.x stream UNIX kernel assigns device numbers arbitrarily.

If new virtual disks are created by StorageWorks Command Console, they are recognized by the kernel immediately upon creation. Virtual disks that are created via an offline utility are recognized at the next system boot.

A given virtual disk retains the same device number until it is explicitly deleted via StorageWorks Command Console, at which time its device number is made available for assignment to a new virtual disk, as detailed above.

- Tru64 UNIX O/S installations are only supported to fully optimized (built) RAIDsets.
- All new KZPCC-CE or KZPCC-AC logical devices created though SMOR or SWCC must be diskabeled. Some of the devices might contain diagnostic disklabels or disklabels preserved from a previous use. These old disklabels are not valid with the new logical devices anymore and must be replaced with new disklabels.
- If there are two KZPCC-CE or KZPCC-AC controllers in your AlphaServer configuration, the HP Tru64 UNIX system may become temporarily locked if the power to the AlphaServer is shut off or a SCSI cable is removed from a StorageWorks device pedestal during I/O operations. Your HP Tru64 UNIX system is expected to recover in the time frame of 3 to 15 minutes.

- Booting up Tru64 UNIX installed on a KZPCC-CE or KZPCC-AC logical unit in general takes longer time than booting up a SCSI Tru64 UNIX single O/S disk. For example it takes about 2 minutes to boot up a DKX (rz online) device versus 6 minutes for a DZX (ri online) device. This is explained by reads from RAID devices take longer than from a single disk drive.
- When running GENERIC kernel, online management and monitoring is not supported. To run StorageWorks Command Console, use a custom kernel.
- During the PK4 installation on an Alpha server with KZPCC-CE/KZPCC-AC controllers running the Tru64 V5.1 O/S after the new kernel is built and the system reboot is initiated the double reboot will occur. This happens due to the specific design of the KZPCC-CE/KZPCC-AC Tru64 UNIX device drivers. The double reboot should not be interrupted.
- The Tru64 UNIX V5.1 PK4 is mandatory for KZPCC-CE/KZPCC-AC controllers' support and should not be removed on a system with those controllers installed. If the PK4 is accidentally removed you must follow the recovery procedure outlined in the CSC Release Notes which are found at the following URL:  
[http://www.tru64unix.compaq.com/faqs/publications/pub\\_page/os\\_update.html](http://www.tru64unix.compaq.com/faqs/publications/pub_page/os_update.html)

If you are still uncertain and need more help you can send e-mail to

[readers\\_comment@zk3.dec.com](mailto:readers_comment@zk3.dec.com)

- After installation of the PK4 on your AlphaServer running Tru64 UNIX V5.1 the system must be rebooted with a new patched kernel. You must not attempt to do any configuration changes and boot genvmunix prior to completing the first reboot with a patched kernel after installing the PK4.
- The KZPCC-CE/KZPCC-AC devices are only supported as data devices in Tru64 UNIX clusters, no boot support is available.

The KZPCC-CE/KZPCC-AC devices in Tru64 UNIX clusters function as local only non-shared devices.

- If you have multiple KZPCC controllers in your system and multiple building or rebuilding RAIDsets and you perform multiple consecutive reboots your system might get in a panic mode during one of the consecutive reboots. You will be able to bring your system up to the O/S by typing "boot" at the SRM console prompt.

## Cache Memory Restrictions

Use only HP part number DIMMs with the KZPCC-CE or KZPCC-AC controller. Follow the procedure in the Maintenance and Troubleshooting section of the user guide to install DIMMs. The KZPCC-CE supports only one 64MB cache memory DIMM, and the KZPCC-AC supports only one 16MB cache memory DIMM.

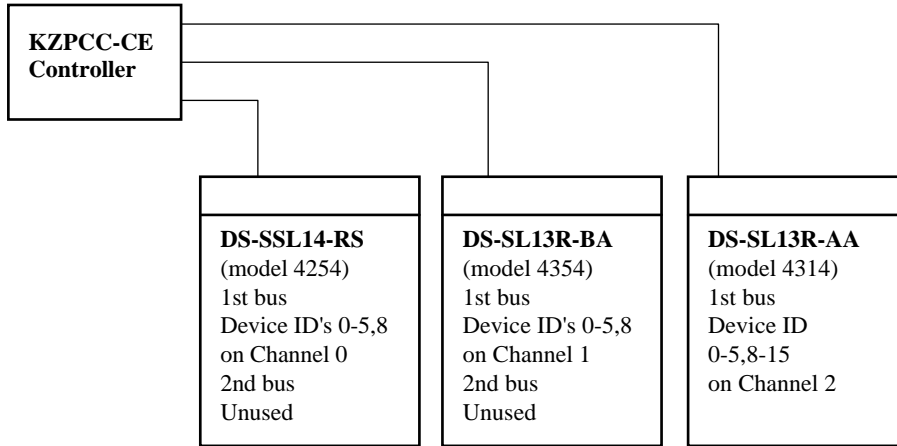
## Configuration Examples

### Hardware and Connection Details

- All cables used are VHDCI to VHDCI BN37A-xx, where 25 meters is the maximum cable length from the KZPCC-CE to the HP StorageWorks Enclosure 4200 (Model 4254) or 4300 (Models 4354 and 4314).
- The model 4254 P/N 138151-001 contains an Ultra2 capable fault-bus supported I/O module which is dual bus only.
- The model 4354 P/N 190211-00 contains an Ultra3 capable fault bus supported I/O module which is dual bus only.
- The model 4314 P/N 190209-001 contains an Ultra3 capable fault bus supported I/O module which is a single bus only.
- For the models 4254 and 4354 the device ID's on each bus segment will be 0 through 5 and 8, since ID's 6 and 7 are reserved for initiators or EMU's as appropriate.
- For the model 4314 the device ID's on each bus segment will be 0 through 5 and 8 through 15, ID's 6 and 7 are reserved again.
- Also contained in the 4254, 4354 and 4314 is an EMU p/n 70-40064-03 with fault bus support.
- HP StorageWorks Enclosure 4200 (model 4254) or 4300 (models 4354 and 4314) device shelves cannot be daisy chained together.



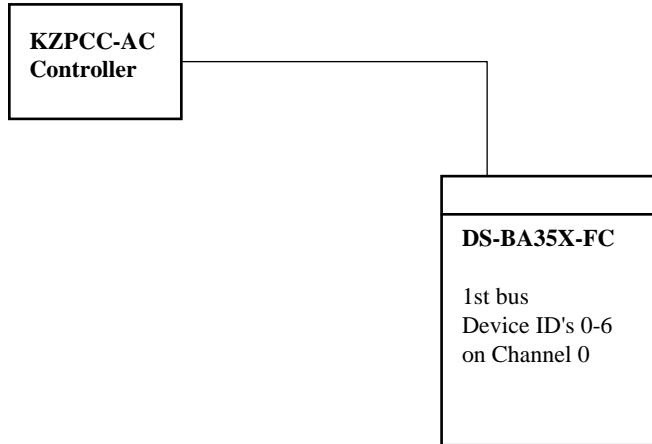
## Example Configuration: 3-channel KZPCC-CE controller and 3 LVD SCSI device enclosures



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Figure 2. KZPCC-CE, three-channel configuration

**Example Configuration: 1-channel  
KZPCC-AC controller and 1 LVD  
SCSI device enclosure**



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