hp AlphaServer ES40, ES40cv, ES40lp & TS40
V7.2 Firmware Release Notes and Update Procedures

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1 Scope

The document list significant changes in this firmware release and describe methods to update console firmware. This document does not describe console firmware internals or console architecture.

1.1 Audience

This document is intended for people responsible for operating system installation/upgrades and for console firmware and console-supported I/O option firmware updates.

1.2 Golden Rules

Update all console firmware before installing or updating an operating system to ensure compatibility. Console firmware for AlphaServer ES40-class, and TS40 systems consists of five firmware entities: SRM, RMC, SROM, AlphaBIOS and TIG firmware. Ensure all firmware is updated to the latest revision level.

Please do not load firmware older than what is presently installed. AlphaServer systems recently shipped may have a higher console firmware revision than this release. The higher firmware revision normally indicates support for the operating system shipped with the system. The revision number for console firmware and for the Alpha Firmware CD is mutually exclusive.

1.3 hp Alpha Retain Trust Program

The hp Alpha Retain Trust Program underscores HP's commitment to providing long-term business continuity for AlphaServer customers. The program eases the evolution of moving from the Alpha platform to Itanium® architecture-based HP systems by ensuring HP carries forward the trust you have placed in us. It is focused on showing you the business value of moving forward with HP as a company, and mitigating the risk associated with transitions to future HP technologies.

1.4 References

Description	Order Number or Reference
Alpha Retain Trust Program	http://www.hp.com/products1/evolution/alpha_retaintrust/
Alpha Systems Firmware Main Page	http://ftp.digital.com/pub/DEC/Alpha/firmware/readme.html
Alpha Systems Support	http://h20000.www2.hp.com/bizsupport/TechSupport/Home.jsp http://www1.itrc.hp.com/service/home/home.do
User Documentation Kit	QA-6E88A-G8
Maintenance Kit	QZ-01BAB-GZ
Model 1 and Model 2 Upgrade	EK-ES4M2-UP
ES40 DIMM Information Sheet	EK-MS610-DM
Rackmount Installation Guide, Template	EK-ES240-RG, EK-ES4RM-TP

2 Read Me First

2.1 Console Changes this Release

Console Enhancements

- WWIDMGR change – do not attempt to get a UDID on a Fibre Channel SAN for SCSI Sequential Access or SCSI Media Changer type devices (i.e. tape drives, robot arm)
- Added new module naming for the following I/O devices seen under the "show config" command. These are RoHS-class devices and functionally identical to their counterparts.
  New DE602-FA/TA (equivalent to –FR/TR) all are displayed as DE602-F*/T*
  New DEGXA-SB/TB (equivalent to –SR/TR) all are displayed as DEGXA-S*/T*

New I/O Option Firmware

- KGPSA-CA (LP8000) - Firmware Revision 3.93A0
- KGPSA-DA (LP9002) - Firmware Revision 3.93A0
- KGPSA-EA (LP9802) - Firmware Revision 1.91X6
- DD-A5132-AA (LP10000) – Firmware Revision 1.91X6

Please ensure all firmware is updated to the latest revision levels.

2.2 Revisions and Compatibility

The three main revision components in a firmware release are Operating System [OS], PALcode, and Console Firmware. OS versions listed are current at the time of this firmware release. This firmware release is also compatible with earlier OS versions that support this platform. Newer firmware versions may be required for newer OS versions if noted in the OS release notes. Please upgrade all console firmware to keep your system current.

Table 2-1 Operating System and Firmware Revision Matrix

Operating System		OpenVMS	V8.2
		Tru64 Unix	V5.1B
CPU PALcode	**EV67, EV68**	OpenVMS	V1.98-104
		Tru64 Unix	V1.92-105
	EV6	OpenVMS	V1.98-4
		Tru64 Unix	V1.91-5
Console Firmware		SRM	V7.2 -1 *****
		AlphaBIOS	V5.71[1]
		RMC	V2.8
		SROM	V2.22-G See Note
		TIG	10

***** Revision changed since the previous release

Note SROM version went from V2.12-F to V2.22G because the firmware is shared with other platforms

[1] Shown under AlphaBIOS as V5.71-R1

2.3 Option Firmware

Table 2-2 PCI I/O Adapter Firmware Revisions

Adapter	FW Revision	Notes
CIPCA	4.20	
DEFEA/DEFPA	3.20	
KGPSA-BC	SS3.20X7	LP7000
DS-KGPSA-CA	DS3.93A0 *	LP8000 1Gb, 64-bit/33MHz PCI Fiber Channel Host Bus Adapter
DS-KGPSA-DA	CS3.93A0 *	LP9002 2Gb, 64-bit/66MHz PCI Fibre Channel Host Bus Adapter (FCA2354)
DS-KGPSA-EA	HD191X6 *	LP9802 2Gb, 64-bit/133MHz PCI-X to Fibre Channel Host Bus Adapter (FCA2384)
DS-A5132-AA	TS1.91X6 *	LP10000 2Gb, 64-bit/133MHz PCI-X to Fibre Channel Host Bus Adapter (FCA2684). **Note:** The LP10000DC [dual channel] DS-A5134-AA is not supported on the AlphaServer ES40
KZPCC	CQ 17	SMOR Utility revision 1.12
KZPDC	3.56	
KZPSA	A12	

* indicates firmware was updated since the previous release

3 Firmware Update Procedure

The firmware update procedure begins by booting the Loadable Firmware Utility [LFU] from the Alpha Systems Firmware CD or from a bootable floppy diskette.

3.1 Update Firmware from CD

1. Insert Firmware CD into the CD drive
2. Type **boot dqa0** - invokes a program to determine system type and to display the default LFU boot file.
3. Press the **Enter-key** after the "Boot file:" prompt – invokes the LFU to allow updating SRM, FSB, SROM and I/O option firmware but not RMC or TIG firmware.
    a. If the RMC and/or TIG firmware has changed, **type exit** then **yes** to enter manual update mode then continue to step 4.
4. Type **update** to update all firmware
5. Type **yes** to confirm updating firmware
6. Type **exit** to load the firmware into flash and to return to the SRM console.

    Note: Power cycle the system only if TIG firmware has a newer firmware version. A power cycle is required for the new firmware to take affect.

3.2 Update Firmware from Floppy Disk

Create Floppy Disks from Tru64Unix Instructions:
http://ftp.digital.com/pub/Digital/Alpha/firmware/readmes/updateviaunix-es40.htm

Create Floppy Disks from Windows Instructions:
http://ftp.digital.com/pub/Digital/Alpha/firmware/readmes/updateviawindows-es40.htm

3.2.1 LFU List Command

Use the list command to display memory-loaded images and currently supported flash ROM's. Note the different output of the list command in default-update and manual-update mode. Example:

Default Update Mode

```
UPD> list
Device      Current Revision      Filename      Update Revision
Abios       V5.70                 abios_fw      V5.71
SRM         V6.9-1                srm_fw        V7.0-2
srom        V2.2F                 srom_fw       V2.12F
UPD> exit
Do you want to do a manual update (y/[n]) ? yes
UPD> list
```

Manual Update Mode

```
Device      Current Revision      Filename      Update Revision
Abios       V5.71                 abios_fw      V5.71
SRM         V6.9-1                srm67_fw      V7.0-2
rmc         V2.7                  rmc_fw        V2.7
srom        V2.12-F               srom_fw       V2.12-F
tig         10                    tig_fw        10
                                  cipca_fw      A420
                                  dfxaa_fw      3.20
                                  kzpsa_fw      A12
UPD>
```

* RMC and TIG firmware displayed only in manual update mode

3.2.2 LFU Update Modes

The Loadable Firmware Utility has a default update and a manual update mode. When first invoked , the LFU is in **default mode** which can update all firmware except for the RMC and the TIG. RMC and TIG firmware can only be update in manual update mode as shown below.

3.2.2.1 Manual Update Mode

UPD> **exit**

Do you want to do a manual update [y/(n)]? YES

UPD> **update** [will update SRM ,SROM, AlphaBIOS, RMC, TIG and I/O option firmware]

Confirm update on:

Abios
SRM
rmc
srom
tig

[Y/(N)] **Y**

WARNING: updates may take several minutes to complete for each device.

DO NOT ABORT!

Abios Updating to v5.71... Verifying v5.71... PASSED.
SRM Updating to V6.0-19... Verifying V6.0-19... PASSED.
rmc Updating to V2.7... Verifying V2.7... PASSED.
srom Updating to V2.12-F... Verifying V2.12-F... PASSED.
tig Updating to 10... Verifying 10... PASSED.

UPD> **exit** [will leave LFU, load update firmware into FlashROM, and init to console prompt]]

3.3 Firmware Recovery

3.4 Fail-Safe Loader

The fail-safe loader [FSL] is a method to recover from possible console firmware corruption (e.g. checksum ROM error). A FSL is enabled by jumper on the system board and requires an FSL floppy disk as part of the recovery system. To create an FSL disk follow the link below. The part number for the Fail Safe Loader disk 1 is QC-081AA-HC

http://ftp.digital.com/pub/Digital/Alpha/firmware/readmes/es40fsl.htm

The FSL is jumper-enabled by moving jumper J22 from position 1-2 to position 2-3. On system power on, the SROM firmware checks jumper J22 then searches for the FSL program from floppy disk to load into memory. Once loaded into memory console terminal displays the SRM prompt P00>>>. From the SRM prompt, insert the Alpha System Update CD, then boot the CD to restore console firmware via the LFU.

Update firmware in LFU manual update mode, as described in section 3.2.2.1. Once firmware is updated, exit the LFU, power down the system and move jumper J22 back to position of 1-2.

Powering up the system completes the recovery procedure.

4 Updating Firmware on ES40cv, ES40lp, TS40/TS20

4.1 SRM Release V6.5 and Newer

Firmware release V6.5 or greater allows updating all firmware for each platforms from CD. Prior to the V6.5 release, RMC firmware updates were done separately for each system type. RMC firmware is not compatible between ES40, ES40cv, ES40lp, or between TS40 systems. Only SRM console is compatible to these sytems.

The following procedure is to update all firmware from CD for ES40cv, ES40lp, and TS40 systems.

Be sure to select the correct boot file for your system.

4.1.1 Update Firmware from CD

Action		**Example**	
Boot firmware CD		P00>>> **boot dqa0**	
Select [directory]bootfile according to system type	ES40 ES40cv ES40lp TS20/TS40	[ES40]ES40_V7_1.EXE [ES40]ES40cv_V7_1.EXE [ES40]ES40lp_V7_1.EXE [ES40]TS40_V7_1.EXE	(press RETURN - default file) (enter directory and file name) (enter directory and file name) (enter directory and file name)
Switch to manual update mode only if you need to update RMC firmware.		UPD> **exit** or **update** Do you want to do a manual update? [y/(n)] **yes** UPD> **update** Confirm update on: Abios SRM rmc srom tig [Y/(N)] **Y** ... UPD> **exit**	Type **update** if you don't need to update RMC firmware.

4.2 SRM Release V6.4 and Earlier

Booting the Alpha Systems Firmware CD will prompt for a bootfile of the Loadable Firmware Utility [LFU]. The LFU contains RMC firmware. Enter the correct system-type bootfile name then press the enter key. Update RMC as shown in the example below. After firmware is updated, type exit from the LFU causes the RMC firmware to be written into FLASH ROM.

4.2.1 Update RMC Firmware on ES40cv and ES40lp

Action	Example
Boot firmware CD	P00>>> **Boot dqa0**
Select boot file for ES40cv Select boot file for ES40lp	Bootfile:**[ES40]ES40CV_F28.exe** (enter directory and file name) Bootfile:**[ES40]ES40LP_I27.exe** (enter directory and file name)
Type exit to switch to LFU to manual mode if you need to update RMC firmware.	UPD> **exit** Do you want to do a manual update? [y/(n)] **yes** UPD>**update RMC** Y ... UPD> **exit**

5 Helpful Hints

5.1 KVM Console Switch Limitations

5.1.1 Run Bios Command in Graphics Mode Not Supported

Use of the SRM "run bios" command from the graphics console when connected through the KVM is not supported, and will result in unexpected keyboard behavior. As a workaround, use the SRM "run bios" command from the serial console via a serial port connection.

5.2 SRM Console Environment Variables

Two SRM console environment variables [ev's] were added (in the V7.0 firmware release) to support requests to have non-volatile ev's readable and writeable from the SRM console and from the Tru64Unix operating system.

5.2.1 user_def1 & user_def2

Format	P00>>> **set user_def<1 or 2>** "<any character string within double quotes>"
Example from SRM	P00>>> **set user_def1** "System_Asset_No: 123456 , System_Location: Green-Zone"
From Tru64 Unix *	# **consvar –g user_def1** user_def1 = System_Asset_No: 123456 , System_Location: Green-Zone # **consvar –s user_def2** "System_Asset_No: 12341234 , System_Location: Rd-Zone" # **consvar –g user_def2** user_def2 = System_Asset_No: 12341234 , System_Location: Red-Zone ***** Only certain EVs are accessible from Tru64 Unix

5.2.2 Memory_Test Environment Variable

Starting with the SRM V5.9 Firmware Release, the **memory_test** environment variable allows the console to test a fixed amount of memory. It is recommended to use the **default value** before booting an operating system. The other values are for console level testing only.

P00>>> **set memory_test <value>**	**full**	- test entire memory (default value)
P00>>> **set memory_test full**	partial	- test only 128MB (not recommended for OS boot)
	none	- test only 32MB (recommended for mfg use only)

5.3 KGPSA Notes

5.3.1 Messages similar to "retry ct pga0.0.0.2.6"

Messages similar to "retry ct pga0.0.0.2.6" may occur on systems that have KGPSA devices and are informational and do not represent an error. They result from rejected accesses to a busy fibre channel switch which are allowed and thus retried.

5.3.2 If a Fibre Cable is Moved

If a fibre cable is moved from one fibre channel port to another, the console will need to be initialized before devices can be accessed via the new switch.

5.4 RMC V2.8

5.4.1 PCI Temperature Sensing

ES40 RMC FirmwareV2.8 supports reporting an error condition to shut down the system when two or more sensors detect over temperature in the PCI option area. Prior to RMC V2.8, the RMC would report an error condition when one of the three sensors detected an over temperature condition.

RMC V2.8 does not require any changes to system board jumper J26. Jumper J26 controls over temp shutdown due to CPU over temp (not PCI over temp).

J26 1-2: Causes system to shut down if over-temperature limit is reached (factory default)
2-3: Permits system to continue running at over-temperature

Note - systems that require J26 in position 2-3 must issue the "**disable ot**" command to disable over temperature shutdown sensing in the PCI option area. Over temperature shutdown is enabled by default.

RMC>**disable ot**
Disable over temperature shutdown.

Verify over temperature shutdown is disabled.

RMC>**env**
Temperature (warnings at 45.0°C, power-off **disabled**)

Enable over temperature shutdown is enabled:

RMC>**enable ot**
Enable overtemp shutdown

Verify over temperature shutdown is enabled.

RMC>**env**
Temperature (warnings at 45.0°C, power-off **at 50.0°C**)
....

RMC V2.8 was first released in July 2003 on the V6.5 Systems Firmware CD.

5.5 Clearing Error Flags in the FRU Table

Use the following sequence to clear the error flags seen, under FRU Table column E column, using the "show fru" command:

P00>>> **show sys_serial_num**	**Record** system serial number
P00>>> **set sys_serial_num ""**	Clear system serial number
P00>>> **clear_error all**	Clear errors
P00>>> **set sys_serial_num snnnnnnnn**	**Restore** system serial number
P00>>> **init**	**Init** or Press the RESET button

5.6 Info Commands 7 & 8

The info 7 & 8 commands are used to display or to clear the console error log. The error log may contain environment-event state information monitored by the remote management console. Environment-event states include: power supply voltages, fans, temperature and cabinet covers. For example, a failing fan or opening the PCI cabinet door cover will result in a 680-machine check. Machine check data is displayed on the console terminal, and recorded in the error log.

P00>>> **info 7** - displays recorded events stored in the console error log
P00>>> **info 8** - clears the console error log

5.6.1 Volatile Environment-Event States

Starting with SRM V5.9, environment-event states stored in the console error log are volatile. The console error log data is erased when the system is power cycled. After servicing a system, it is recommended to clear the console error log (info 8) before booting an operating system

5.7 Removing Power from a Power Supply

After removing power from one of the power supplies, wait at least thirty seconds, after the green LEDs are off, before restoring power. This will ensure the correct status is displayed by the OCP, the SRM *show power* command and RMC *env* command. If the status remains the same, press the RESET button the from the Operator's Control Panel if the system is at the console prompt.

5.8 Distinguishing Between DE602-BA/BB Ethernet Cards

The DE602-BA and DE602-BB have different PCI bridge chip. The DE602-BB uses the 21154-BE PCI Bridge chip. The console "show config" command displays a DE602-BA or a DE602-BB Ethernet card as a **DE602-B*** because both cards use similar Ethernet chips but have different PCI Bridge chips.

5.9 Show Bios & Run Bios Commands (V5.8 and greater)

The **show bios** and **run bios** commands were introduced in SRM V5.7 release. In the SRM V5.8 release, the command format changed for the **run bios** command (to be more consistent with console command formats).

5.9.1.1 Serial Terminal Setup for Run Bios

The serial terminal should be at least a VT220 and setup with the following parameters:

- **9600 bauds, 8-bits, No Parity and One Stop-bit**

show bios - lists the location of controllers with a BIOS expansion ROM. Not all controllers have a BIOS expansion ROM. The show bios command will reset the I/O buses.

P00>>> **show bios <hose> (where <hose> = 0 or 1, default is 0)**

run bios - will invoke a BIOS expansion ROM on a supported PCI controller (e.g. KZPCC-CE). This command is commonly used to invoke functions or utilities in the device expansion ROM. For example, the KZPCC-CE uses the expansion ROM for its configuration utility.

P00>>> **show config** (to get controller name)

P00>>> **run bios [controller name]** e.g. P00>>> run bios pka0

The run bios command invokes the console to reset the PCI bus and to prompt the user to enter a control sequence (e.g. Ctrl^D) in order to enter the BIOS utility of the PCI option. The control sequence may differ depending on the PCI option. Refer to the documentation supplied with the PCI option.

5.10 Com1_mode Settings

When com1_mode is set to **firm_bypass** mode and external power is removed then later restored, the value of com1_mode will change to its default value of **through** mode. The table lists the com1_mode value combinations:

COM1_MODE

Current-value	Value/Mode after a power cycle
Through (default)	Through
Local	Local
Snoop	Snoop
Soft_bypass	Snoop
Firm_bypass	Through

5.11 RMC History

This section identifies significant changes to the Remote Management Console. Not all changes are listed. Be sure to update the RMC using the procedure shown in Reference Section: 3.2.2.1 for the AlphaServer ES40.[2]

RMC	Change History	FW CD[3]
V2.7	Use correct status bit for power supply PS2. The symptom is, if PS2 fails, the env command shows "PS2 : OK" because the RMC used PS1 status bit for PS2	V6.0
V2.6	During an over temperature warning, if another RMC detected environmental event changes from bad to good the RMC may hang. RMC V2.5 Changes	V5.9
V2.5	"RMC parser in use" symptom solved as described in section 5.11.1 Pressing the "reset" button does not clear the warning message on the OCP if the warning is still occurring When any warning event goes away, the RMC also checks for previous PS warnings	V5.8
V2.4	Improve power sequencing Improve voltage tolerance monitoring to +/ 15% Fix fan5/fan6 sensing problem that was only in RMC V2.3	V5.7

5.11.1 RMC Parser in Use Symptom

"RMC parser in use "may be displayed on your terminal when the RMC detects a specific escape sequence on the internal system COM1 port. The internal system COM1 port is used by system software to send data either to the external COM1 port or to the RMC modem if a modem is connected. The internal system COM1 port should not be confused with the external COM1 serial port on the back of the system. Ref: AlphaServer ES40 Service Guide.

The RMC parser in use" symptom is solved using a new console environment variable called sys_com1_rmc explained in the next section.

5.11.2 RMC Environment Variable - sys_com1_rmc

The sys_com1_rmc console environment variable was created in V5.8 console for the RMC to not detect specific escape sequences from the internal system COM1 port. This **internal system COM1** port should not be confused with the **external COM1 serial port** on the back of the system.

The value of sys_com1_rmc should be left in the default **ON** state. The state of sys_com1_rmc does not affect RMC access from the local_COM1 (mmj port), COM1, or modem external ports.

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[2] Refer to Section 4.1 for updating RMC firmware for the AlphaServer ES40cv, ES40lp and TS40 Systems.

6 Known Anomalies and Restrictions

6.1 Power Supply Zero (PS0)

This anomaly is with **Console Firmware V6.2-V6.4 Only**. Power supply zero must be installed in the system at all times. In the event of a PS0 failure, do not remove PS0 from the system until a replacement power supply is available. This anomaly is fixed in console V6.5.

Symptom: The OpenVMS Operating System *may* panic (Bugcheck) on a reboot with PS0 physically removed from the system.

6.2 Set Cpu_Enabled Command

Console environment variable [EV] **cpu_enabled** is set to a mask of F's to enable all CPU's. You must **init** the system if you change this value. Before booting an operating system, it is recommended to **reset** the system to avoid seeing CPU-timeout message on the CPU's that were disabled.

For example changing cpu_enabled, on a four-cpu system, from F to 1 will disable cpu1-3, after typing init and without resetting the system, the OpenVMS may report an informational message: *"one CPU active and three CPU's are in Timeout"*.

6.3 Ctrl^P/Show Device/Continue Sequence

Under OpenVMS, typing ctrl^p then "show device" the "continue" will not allow you to return to the operating system. Under OpenVMS, typing **ctrl^p** switches terminal control from OS program mode to console mode. Typing the **continue** command returns terminal control to OS program I/O mode. Do not use the "**show device**" command when switched to console mode because the show device command restarts the console IO such that you cannot return to OS program mode.

6.4 Attaching Storage Devices to KZPEA

In the event storage devices attached to a KZPEA adapter is powered up while the system is in console mode, the system must be reinitialized (**type init**) in order to recognize the attached storage devices. Initialization is not necessary when storage is powered up at the same time as the system or when the system is running an operating system.

6.5 PBXDA-AC Rev. F Module – may hang SRM Console

SRM V6.0 Only. Revision F of the PBXDA-AC module may hang the console during console probing the PCI bus. The solution is to upgrade to V6.1 console firmware (or downgrade to V5.9). Please note that Revision E of the PBXDA-AC, Rev. F of the PBXDA-AC with and an SROM older the Rev. G does not affect the SRM console.

6.6 Console Output - p == &tftq = no request for this packet

This anomaly occurs only SRM V5.9. The message "p == &tftq = no request for this packet" is informational only and can be ignored. It may be displayed by the console when the network receive process received a tftp packet out of protocol. The packet is discarded by the network receive process.

6.7 DE600 MOP Timeouts

A mop timeout error occurs during the network-testing phase of Power-On-Self-Test [POST]. The symptom exists only with SRM firmware V5.7 and can be ignored.

Symptom Example:
Testing the Network
*** Error (eic0), Mop loop message timed out from: 00-50-8b-ac-15-fa
*** List index: 0 received count: 3 expected count 4

6.8 CPU-Speed/PALCode Mismatch Detection

Starting with SRM firmware V5.8[4], CPU-speed/PALCode mismatch can occur when changing CPU's to a different speed without re-flashing SRM firmware[5]. Changing CPU's without re-flashing SRM firmware may result in application performance loss or unexpected system behavior. During console initialization, a detected mismatch displays a *mismatch warning* to the console screen then will log a warning in the console event log

The SRM console has separate firmware images for EV6 and EV67/EV68 CPU's. When updating firmware, the LFU will load the correct SRM version (which includes PALCode) The PALCode version number is formatted as Vx.yy-z for the EV6 CPU's, and formatted as Vx.yy-zzz for the EV67 or EV68 CPU's. Refer to Table 2-1 Operating System and Firmware Revision Matrix for current revisions.

6.9 PCI Bus Slot Restrictions

6.9.1 Oxygen VX1 Graphic Card and Adaptec Controller

With SRM V5.9 and earlier console, the Oxygen VX1 graphic card must be plugged in a lower numbered PCI slot that an Adaptec controller. An Adaptec controller plugged in a lower PCI Bus slot number than an Oxygen VX1 graphic card may cause a console hang. This restriction is removed in V6.0 by updating to the AlphaBIOS V5.71 console.

6.9.2 Only One VGA Enabled Graphics Card

Only one VGA graphic controller card, that is VGA-Enabled, is supported in PCI0 bus slots. Multiple graphics cards that are not VGA-Enabled, are supported in both PCI0 and PCI1 bus slots. (e.g. for multi-graphic-head configurations)

6.10 NHD2/NHD3 Installations and Memory_Test EV

To instrument NHD2/3 installs, please ensure the console **memory_test** environment variable [ev] is set to its default value "full" to ensure all memory is tested. NHD2/3 installs may not complete with untested memory.

6.11 KZPEA-DB - Missing BUS Termination Jumpers Can Hang Console

The KZPEA must have bus termination jumpers installed or the console may hang when trying to probe the controller for information. The two bus termination jumpers are next to the internal connectors.

6.12 PBXGB-AA - Switch Position Zero Causes Blank Screen

The switch position on the PBXGB-AA PowerStorm graphics card should be set to **position six** (1024x768 at 72Mhz). The graphics card may be shipped with the switch set to **position zero** (1280x1024 at 72Mhz). Tru64 Unix currently does not support this graphics card when set to position zero (1280x1024 at 72Mhz).

6.13 Don't Hot Swap that Mouse or Keyboard

Do not hot swap a mouse or keyboard because it may cause electronic damage to the transceivers. Ensure power is off when replacing these components. Also removing a mouse after the system is in SRM console mode will prevent any response from the keyboard (until the mouse is plugged back in).

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[4] V5.8 used CPU speed as one of the detection parameters. V5.9 and greater use CPU-id because of the availability of both EV6 and EV67 500Mhz CPU's.

[5] SRM firmware is re-flashed whenever you do a firmware update. The LFU will load the correct SRM version into flash.

6.14 Fibre Channel Behavior

6.14.1 Console Messages When Fibre Channel Driver Starts

When the console fibre channel driver starts, you may see the message **"pga0.0.0.2.4 - Nvram read failed"**. This message indicates the KGPSA's NVRAM is either unformatted or is not working properly. The more likely reason is an unformatted NVRAM.

Beginning with V5.6 console firmware:

The console contains a portion of the NVRAM to indicate if the adapter should be initialized to a Fabric (Switch) topology or initialized to a Loop topology. By default, the console initializes the KGPSA to a Fabric topology.

The NVRAM is **automatically formatted** when the topology is set.

References: WWIDMGR USERS MANUAL
http://ftp.digital.com/pub/DEC/Alpha/firmware/v*.*/doc/wwidmgr.*

```
P00>>>wwidmgr -show ada
item    adapter              WWN              Cur. Topo  Next Topo
pga0.0.0.8.1 - Nvram read failed.
[ 0] pga0.0.0.8.1     1000-0000-c920-05ab          FABRIC     UNAVAIL
pgb0.0.0.10.1 - Nvram read failed.
[ 1] pgb0.0.0.10.1     1000-0000-c921-0ce0          FABRIC     UNAVAIL
[9999] All of the above.
LP00>>>wwidmgr -set adapter -item 9999 -topo fabric
pga0.0.0.8.1 - Nvram read failed.
Reformatting nvram
pgb0.0.0.10.1 - Nvram read failed.
Reformatting nvram
LP00>>>wwidmgr -show ada
item    adapter              WWN              Cur. Topo  Next Topo
[ 0] pga0.0.0.8.1     1000-0000-c920-05ab          FABRIC     FABRIC
[ 1] pgb0.0.0.10.1     1000-0000-c921-0ce0          FABRIC     FABRIC
[9999] All of the above.
LP00>>>init
```

6.14.2 Messages - MBX Not Ready

KNOWN PROBLEM:

You may see a "*** MBX not ready ***" error when formatting the Nvram
with the "wwidmgr -set ada" command. Reissuing this command should
succeed:

P00>>>**wwidmgr -set ada -item 9999 -topo fab**
pga0.0.0.6.1 - Nvram read failed.
Reformatting nvram
*** MBX not ready ***
pgb0.0.0.1.2 - Nvram read failed.
Reformatting nvram
P00>>>**wwidmgr -show ada**
item adapter WWN Cur. Topo Next Topo
*** MBX not ready ***
pga0.0.0.6.1 - Nvram format incorrect.
[0] pga0.0.0.6.1 1000-0000-c920-a763 FABRIC UNAVAIL
[1] pgb0.0.0.1.2 1000-0000-c920-c9fe FABRIC FABRIC
[9999] All of the above.
P00>>>**wwidmgr -set ada -item 9999 -topo fab**
P00>>>**wwidmgr -show ada**
item adapter WWN Cur. Topo Next Topo
[0] pga0.0.0.6.1 1000-0000-c920-a763 FABRIC FABRIC
[1] pgb0.0.0.1.2 1000-0000-c920-c9fe FABRIC FABRIC
[9999] All of the above.

6.14.3 Command wwidmgr -quickest -item <n>

KNOWN PROBLEM:

Command "wwidmgr -quickset -item <n>" MUST also have the "-unit" qualifier on the line.
This functionality is not working properly, and a -unit MUST be specified.
RE: WWIDMGR USERS' GUIDE

"If no unit number is specified, console will generate one that is a hashed value of the WWID."

7 Fibre Channel Notes

7.1 WWIDMGR – Fabric and LOOP Support

The console supports the HSG80 configured in LOOP mode using a DS-SWXHB hub. The disk devices are found and available as boot devices with the WWIDMGR. KGPSA adapter topology must be declared as LOOP with the console WWIDMGR command:

The "wwidmgr –set adapter" command is used to format the KGPSA NVRAM and to configure the KGPSA to run on a **LOOP** or a **FABRIC**. WWIDMGR command format:

wwidmgr –set adapter –item <itemno> -topo <FABRIC|LOOP>

<itemno> is the value from the "wwidmgr – *show* adapter" command.

In the figure below, the operator changes all the KGPSA's from FABRIC to LOOP by specifying an **itemno** value of 9999. The init is shown at the end to emphasize that the setting in the running adapter

LP00>>>**wwidmgr -show ada**

item adapter WWN Cur. Topo Next Topo

[0] kgpsaa0.0.0.8.1 1000-0000-c920-05ab FABRIC FABRIC

[1] kgpsab0.0.0.10.1 1000-0000-c921-0ce0 FABRIC FABRIC

[.9999] All of the above

LP00>>>**wwidmgr -set adapter -item 9999 -topo loop**

LP00>>>**wwidmgr -show ada**

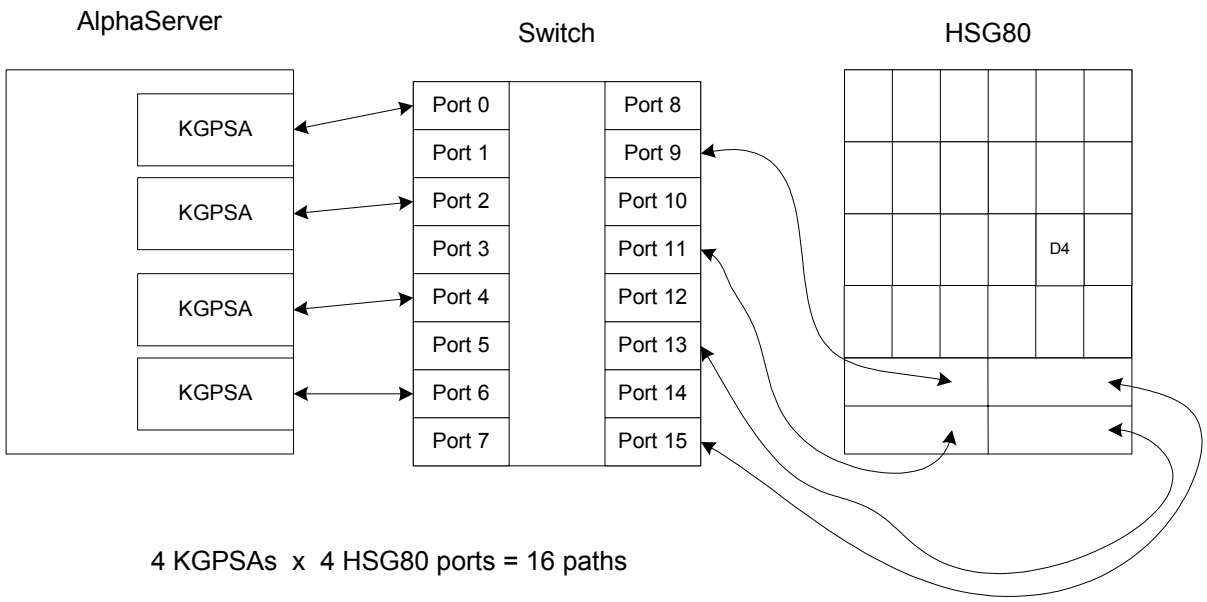
item adapter WWN Cur. Topo Next Topo

[0] kgpsaa0.0.0.8.1 1000-0000-c920-05ab FABRIC LOOP

[1] kgpsab0.0.0.10.1 1000-0000-c921-0ce0 FABRIC LOOP

9999] All of the above

7.2 WWIDMGR – Bug Fixes



- Increased the multipathing limit to 128. Prior to V5.8 an error message "ERROR: Multipathing exceeds 16" was displayed if the number of paths to any disk was greater than 16. The number of paths is counted by the adapter and by the HSG80 port combination. Prior to V5.8, only 4 adapters on a host could access all HSG80 ports, yielding 16 paths to D4. Raising this limit to 128 allows for more than 4 adapters to access all the HSG80 ports.
- The command "**wwidmgr –quickset –item**" gave duplicate unit numbers prior to V5.8, and the "-unit" qualifier was mandatory. This has been fixed and the default unit numbers are used when no "-unit" is specified.
- Upper case is now supported in all commands. Prior to V5.8, some commands such as "WWIDMGR –SET ADAPTER" would fail and had to be issued in lower case.

7.2.1 KGPSA Driver

- The KGPSA firmware revision is now reported in the event logger. Issuing a ">>>cat el" displays the entire event log.
- Prior to V5.8, shutting down the KGPSA driver on an unstable fabric would sometimes hang. This has been fixed.
  On VMS shutdown, the error message "NVRAM read failed" was sometimes seen. This has been fixed.

  A "Probing Timeout" message and/or incomplete device discovery could have occurred on an unstable fabric. Robustness to handle lost Extended Link Service packets has been added to address this.
- Initializing the adapter has been enhanced to address false "LINK_DOWN Timeouts that have been seen on driver startup.
- The V5.6 release notes explain a problem seen as a "*** MBX not ready***" error when formatting the KGPSA Nvram with the ">>>wwidmgr –set adapter" command. The mailbox timer has been increased to allow the adapter to finish this operation.
- The ">>>wwidmgr –show –full" command, after link transitions from up to down, followed by a link up, would indicate erroneously "NO LONGER VALID" next to the KGPSA adapters.

7.3 Known Bugs Unresolved - KGPSA

- In the WWIDMGR, KGPSA adapters with loopback connectors result in a "Probing Timeout" error message after a 20 second delay. *Workaround:* Remove the loopback connector. To keep the connector optics clean, plugs should be used on idle adapters.
- In the WWIDMGR, giving a ***–item*** value that is out of range can crash the console. *Workaround*: Be careful when entering *–item* values. Fixed in a future release.
- A ">>>**wwidmgr –set wwid**" prior to a "**wwidmgr –show wwid**" fails with an error message of "wwid2wwev – invalid wwid". Workaround: Issue the –show prior to any –set commands.

8 Using FFAUTO and FFNEXT Environment Variables

This section describes how to use console environment variables FFAUTO and FFNEXT to force devices (e.g. disks) from a "not connected" state to a "connected" state to make them bootable. The console does not allow booting devices that are in a "not connected" state. For additional documentation refer to WWIDMGR documentation.

FFAUTO and FFNEXT are used for situations and configurations where an operator needs to force the console to boot a "not connected" device. These console environment variables were introduced in console firmware V5.5 (August 1999).

8.1 Background Information On Device States

8.1.1 Behavior of "Not Connected " Devices

HSZ8x disk array controllers or HSG8x array controllers may have their disks in a "connected" or "not connected" state. In MULTIBUS mode, a disk state of "not connected" is normal and correct. The console does not allow booting devices in the "not connected" state.

An attempt to boot a "not connected" disk produces the following console error message:

```
P00>>>b dga40.1003

resetting all I/O buses
VGA Bios failed, status = 1
(boot dga40.1003.0.6.0 -flags 0)
dga40.1003.0.6.0 is not connected
failed to open dga40.1003.0.6.0
```

8.1.2 To Successfully Boot a Disk

To successfully boot a disk, select either a "connected" disk or use the FFAUTO or FFNEXT command.

8.1.3 Using the HSZ80 or HSG80 Console to Determine a "Not Connected" Device

The HSZ8x or HSG8x console can help the operator determine where a disk device is connected. In this HSG80 console example below, the disk is **connected** because the state of disk device d40 is '**ONLINE to this controller**'.

```
HSG80> show d40
  LUN                                Uses          Used by

------------------------------------------------------------------------------


 D40                                 DISK50000
      LUN ID:     6000-1FE1-0000-04A0-FFFF-FFFE-0005-0000
      IDENTIFIER = 40
      Switches:
        RUN                NOWRITE_PROTECT       READ_CACHE
        READAHEAD_CACHE
        MAXIMUM_CACHED_TRANSFER_SIZE = 32
      Access:
        ALL
      State:
        ONLINE to this controller
        Not reserved
        NOPREFERRED_PATH
      Size: 4110480 blocks
      Geometry (C/H/S): ( 3045 / 16 / 85 )
```

8.1.4 Methods from the SRM Console to Determine a "Not Connected" Device

8.1.4.1 Console Error Message at Boot Time

The console error message at boot time, as previously shown, is one way to determine a "Not Connected" device. This console error message is also displayed when a console disk exerciser attempts to exercise a "Not Connected" device.

8.1.4.2 WWIDMGR Command

1. Using the WWIDMGR command, the console can also display the status of Fibre Channel devices controlled by an HSG8x.

```
P00>>>wwidmgr -show wwid -udid 40 –full

[0] UDID:40 WWID:01000010:6000-1fe1-0000-04a0-ffff-fffe-0005-0000 (ev:wwid0)
 - current_unit:40 current_col: 1 default_unit: 5901

        via adapter       via fc_nport          Con    DID    Lun
-       pga0.0.0.6.0  5000-1fe1-0000-04a2  Yes  210313   40
-       pga0.0.0.6.0  5000-1fe1-0000-04a1  Yes  210513   40
-       pga0.0.0.6.0  5000-1fe1-0000-04a4  No   210713   40
```

8.2 Forcing the Console to Use a "Not Connected" Device

8.2.1 Using FFAUTO to Autoboot a "Not Connected" Devices

FFAUTO determines console behavior when the system is trying to autoboot. An autoboot is any boot other than a manual **>>>boot** command issued at the SRM console by a user. FFAUTO can be set to ON or OFF. The Default State is OFF where console behavior is not affected. FFAUTO is stored in non-volatile memory therefore its state persists across system resets and power cycles.

>>> **SET FFAUTO ON**

With FFAUTO in the ON state, console behavior is affected during an autoboot. When the console is trying to autoboot, the console attempts to boot from each "connected" device in the bootdef_dev list. If the console reaches the end of the bootdef_dev list without successfully booting, the console goes to the beginning of the bootdef_dev list and attempts booting again. Disks that are found in the "not connected" state are then changed to the "connected state", thereby enabling the console to access that device.

8.2.1.1 Example Using the FFAUTO Environment Variable

```
P00>>>set FFAUTO ON
P00>>>set bootdef_dev dga40.1003
P00>>>boot
(boot dga40.1003.0.6.0 -flags 0)
dga40.1003.0.6.0 is not connected
failed to open dga40.1003.0.6.0
P00>>>init

VMS PALCode V5.56-7, OSF PALCode V1.45-12
starting console on CPU 0
CPU 0 booting

(boot dga40.1003.0.6.0 -flags 0)
dga40.1003.0.6.0 is not connected
failed to open dga40.1003.0.6.0

Retrying, type ^C to abort...

(boot dga40.1003.0.6.0 -flags 0)
block 0 of dga40.1003.0.6.0 is a valid boot block
reading 896 blocks from dga40.1003.0.6.0
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 70000
initializing HWRPB at 2000
initializing page table at 1ff0000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code
```

8.2.2 Using FFNEXT on "Not Connected" Devices

FFNEXT determines console behavior of the next command issued to a “not connected” device. FFNEXT can be set to ON or OFF (default state). In the default state is console behavior is not affected. FFNEXT is a volatile environment variable whose value is temporary and does not propagate across a system reset or reboot.

>>> SET FFNEXT ON

With FFNEXT set to the ON state, the console will change the next “not connected” device to a “connected” state for booting. FFNEXT state is automatically reset to OFF when the console changes device state from “not connected” to “connected”. Resetting FFNEXT to the OFF state protects the user from accidentally changing the state of disks. The state of FFNEXT stays in effect until a "Not Connected" device is accessed.

8.2.2.1 EXAMPLE: FFNEXT

```
P00>>>b dga40.1001
(boot dga40.1001.0.6.0 -flags 0)
dga40.1001.0.6.0 is not connected
failed to open dga40.1001.0.6.0

P00>>>set ffnext on
P00>>>b dga40.1001

(boot dga40.1001.0.6.0 -flags 0)
```

```
block 0 of dga40.1001.0.6.0 is a valid boot block
reading 896 blocks from dga40.1001.0.6.0
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 70000
initializing HWRPB at 2000
initializing page table at 1ff0000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code


    OpenVMS (TM) Alpha Operating System, Version X6PC-SSB


halted CPU 0
halt code = 5
HALT instruction executed
PC = ffffffff8b4e2ba4
P00>>>show ffnext
ffnext                  OFF

End of Examples
```

9 MS610-DA/EA Memory - Stacked or Monolithic?

If your system contains MS610-DA or MS610-EA memory options, the four DIMMs may contain either stacked or monolithic type SRAMS. Stacked DIMMs, (also known as double-density DIMMs), have memory chips physically piggybacked onto each other. Stacked and monolithic DIMMs currently have the same part number but the DIMMs are NOT interchangeable. This means that each memory array requires the same DIMM type.

When ordering the MS610-DA or MS620-ES, make sure you specify stacked or monolithic DIMM type.

Determining DIMM type andMS610 part numbers are listed in Table 2 below.

9.1.1 How to Determine DIMM Type

A DIMM type is classified as either stacked or monolithic. DIMM type is determined by examining byte five of the dual port ram. Use the examine command from the SRM console as shown in the example in the table below.

Table 2 Determining DIMM Type - Stacked or Monolithic

DIMM Location	Hex Addr	DIMM Location	Hex Addr	Memory DIMM Part Number	
MMB0 J1 DIMM1	105	**MMB2 J1 DIMM1**	1105	**MS610-DS**	Four - 256MB DIMMs
MMB0 J2 DIMM2	205	**MMB2 J2 DIMM2**	1205	**MS610-ES**	Four - 512MB DIMMs
MMB0 J3 DIMM3	305	**MMB2 J3 DIMM3**	1305	**MS610-DM**	Four - 256MB DIMMs
MMB0 J4 DIMM4	405	**MMB2 J4 DIMM4**	1405	**MS610-EM**	Four - 512MB DIMMs
MMB0 J5 DIMM5	505	**MMB2 J5 DIMM5**	1505		
MMB0 J6 DIMM6	605	**MMB2 J6 DIMM6**	1605		
MMB0 J7 DIMM7	705	**MMB2 J7 DIMM7**	1705		
MMB0 J8 DIMM8	805	**MMB2 J8 DIMM8**	1805		
MMB1 J1 DIMM1	905	**MMB3 J1 DIMM5**	1905		
MMB1 J2 DIMM2	A05	**MMB3 J2 DIMM6**	1A05		
MMB1 J3 DIMM3	B05	**MMB3 J3 DIMM7**	1B05		
MMB1 J4 DIMM4	C05	**MMB3 J4 DIMM8**	1C05		
MMB1 J5 DIMM5	D05	**MMB3 J5 DIMM5**	1D05		
MMB1 J6 DIMM6	E05	**MMB3 J6 DIMM6**	1E05		
MMB1 J7 DIMM7	F05	**MMB3 J7 DIMM7**	1F05		
MMB1 J8 DIMM8	1005	**MMB3 J8 DIMM8**	2005		

Format to examine a dual-port ram address:

P00>>> **examine dpr:<hex-address> -b**

Example:

P00>>> **examine dpr: 105 –b**

Dpr: 105 02

A value of **02** indicates a stacked DIMM type

Stacked DIMM dpr value = **02**
Monolithic DIMM dpr value = **01**

10 Firmware Change History[6]

10.1 V7.1 January 2006

Console Enhancements

- Memory Timing Register adjusted to improve memory DIMM reliability when in elevated temperature environments.
- Kgpsa driver: faster retry on PLOGI frames
- Scsi driver: enhance page and field length checks for SCSI inquiry responses.
- aic78xx driver: increase the number of supported targets from 16 to 32

New I/O Option Firmware

- LP10000 - Firmware Revision 1.91A1
- LP9802 - Firmware Revision 1.91X1
- KZPDC – Firmware Revision 3.56

Other

- See note on KVM console switch – restriction using "run bios" command

10.2 V7.0 June 2005

Console Enhancements

- Two new SRM console environment variables for customer use. The ev's "user_def1" and "user_def2" takes a string argument and accepts any characters within double quotes. The ev's are nonvolatile and are accessible from the Tru64 operating system. The ev's are not accessible from OpenVMS.
  Details in section: 5.1
- DEFPA – increase driver setup time in the data link layers.

Bug Fixes and Other

- KGPSA and WWIDMGR – increase the number of Nx EV's
- SmartArray 5300 – fixed serial emulation

10.3 V6.9 November 2004

Bug Fixes and Other
WWIDMGR HANG Symptom - A patch has been applied to the fibre-channel support to resolve a problem that causes the WWIDMGR utility to hang and never complete. The hang would occur with the first invocation of the WWIDMGR utility. Configurations where this problem has been seen are: EMC Symmetrix storage arrays utilizing Timefinder or SRDF business continuance volumes (BCV) that are in an "established" state, and possibly misconfigured or failing volumes. These volumes may respond to an inquiry from the host as being "not ready". The "not ready" state is indicated by an invalid device id that was accepted as valid by the console. The console software has been modified to bypass volumes with invalid device ids and log the device id information to the console error log.

10.4 V6.8 August 2004

Console Enhancements:

- Console Recognition of the following Options

[6] Not all changes are listed.

  - 3X-DAPBA-FB, 3X-DAPBA –FB/UB Asynchronous Transfer Mode Adapters
  - 3X-KPKON-AA Fault Management Control Module
- I/O Option Vendor-Name/Device-Name - New Firmware Revision
  - LP8000/KGPSA-B - DS3.92A2
  - LP9002 /FCA_2354 - CS3.92A2
  - LP9802/FCA_2384 - HS1.81A5
- Bug Fixes and Other
  - Correct a problem in the fibre-channel driver that occasionally resulted in a boot, reboot or crash dump failure with an error message of "cb_open failure".

10.5 V6.7 May 2004

Console Enhancements

- Loadable Firmware Utility [LFU]
  - The LFU now supports updating option firmware for the LP1000 (FCA-2684) Fibre Channel Card.
- Console Recognition of the Asynchronous Transfer Mode [ATM] Adapters
  - 3x-DAPBA-FA, 3X-DAPBA -UA, and 3X-DAPCA-UA
- I/O Option Firmware Changes:
  - KZPDC option firmware updated to version 3.40 (was v2.94)
  - LP10000 option firmware added to V6.7 firmware CD

Bug Fixes and Other

- Gigabit Ethernet driver:
  - Fix output of link state messages during a callback. Console log when OpenVMS is booting is now cleaner.
  - Fix link status after plugging into a live Ethernet network after the system has been powered up. Symptom: Link light would turn not on after plugging in a wire until a boot or an init command.
- X86 - fix a double de-allocation of memory in the bios emulator. This could cause a stack trace on an OS shutdown when bootbios is set to a controller that is not used to boot the operating system.

10.6 V6.6 November 2003

Console Enhancements

- KGPSA Behavior
  - Several kgpsa changes have been made to prevent "cb_open fail" and other boot failures
  - Serious kgpsa faults will now cause the console to crash rather than hang in the debugger.
  - In some rare cases it may take up to a minute or more for the link to initialize. There is a two-minute timer to prevent the system from hanging.
  - There is a small period of time after the system is initialized where some fibre channel disks will not be displayed with a "show device" command. If the system boots during this period the message "waiting for poll to complete" followed by the device name will be displayed while waiting for the device.

- KGPSA Messages
  - The kgpsa will report when it is not connected to a switch or arbitrated loop with the message "***open fibre***" followed by the ***device name***.
  - Several kgpsa error messages have been expanded to include the device name
  - Several kgpsa error messages have been removed because they were reporting normal behavior

Bug Fixes and Other – none

I/O Option Firmware Changes:

- FCA_2384 (LP9802) Firmware revision changed to 1.00x8

10.7 V6.5 June 2003

Console Enhancements

- Update test scripts to support testing gigabit Ethernet network devices (example: ega0)
- **For AlphaServer TS40, ES40LP, ES40CV system only**
  - Simplify firmware update steps from the Alpha Systems Firmware CD. Refer to Section 4. Requirements - After booting the Alpha Systems CD, enter the system filename after the Bootfile: prompt. Firmware images are in the ES40 system directory:

    Format: Bootfile: **[<system directory>]_<firmware version>.exe**
    Example: Bootfile: [ES40]TS40_V6_5.EXE

    - TS40 systems - [ES40]TS40_V6_5.EXE
    - ES40lp systems – [ES40]ES40LP_V6_5.EXE
    - ES40cv systems – [ES40]ES40CV_V6_5.EXE

  The procedure to update firmware from floppy disk remains the same.

- RMC – Report over-temperature failure only when two sensors fail (it used to be one). See section 5.4

Bug Fixes

- OpenVMS would Bugcheck if Power Supply Zero [PS0] was physically removed from the system. See Known Anomalies with PS0 in Section 6.1

- Memory Channel 2 driver - module configuration register was incorrectly being restored during a system warm restart.

Other

- **KGPSA** Notes – see section 5.1

10.8 V6.4 December 2002

Console Enhancements

- RMC - adjust power supply tolerances
- SRM – KGPSA Firmware Revision Update
- Support for the DEGXA-SA fiber optic network card

Bug Fixes

- DEGPA corrected to re-establish the link during a console callback that attempts to perform I/O on the Gigabit Ethernet device.

  Problem description: Console driver for Gigabit Ethernet failed to establish a link during a Tru64 Unix RIS installation, causing the installation to fail.

- Memexer_mp – fix script for d_group usage to enable running memtest_victim (manufacturing use only)

- Show FRU command did not display device plugged into hose3 slot2.
- See new Known Anomalies with PS0 in Section 6.1

10.9 V6.3 August 2002

SRM Console Enhancements

- Update buildfru to accept new mfg serial number prefix's JA and 4D
- This release provides device recognition, boot support, and adapter firmware update support, for the 3X-KZPDC-BE/DF SmartArray 5305A adapters.
- The "set prompt" command was added to console command list e.g. P00>> set prompt "_system1>" produces a console prompts of **P00_system1>**

Bug Fixes

- KGPSA
  - The console now properly recognizes responses from remote KGPSA adapters in console mode and does not report "probe timeout retry." This message that does not indicate abnormal operation is now reported in the event log rather than the console log.
  - The **port WWID** rather than the **node WWID** is displayed for the kgpsa adapter by the "show config" and the "show device" commands. The **port WWID** number is needed to configure fibre channel switches and storage controllers.

Any of 255 units on an HSV fibre channel storage controller can now be configured rather than the previous limit of the first 127 units.

10.10 V6.2 Interim Release

V6.2B – May 2002 – Support, in buildfru command, new mfg serial number prefix's

10.11 V6.2 April 2002

SRM Console Enhancements

- Changed eia*_mode default to "auto-negotiate" for DE600 and DE602 Ethernet cards
- Changed eia*_mode default to "FastFD" for the DE602-FA
- Bootp driver – generate ack on tftpoack (required for Linux Servers)
- Show FRU display - serial number format correction for 3rd Party DIMMs and for power supplies. Serial number is now ten characters for power supplies.
- New PALCode

Bugs fixed

- SRM Console – missing CPU's under OpenVMS 7.3 with console lp_count equal zero and lp_cpu*mask equal non-zero.
- Fixed memory allocation symptom using wwidmgr commands on a large SAN. The symptom was seen after the first wwidmgr command and would cause the following messages.
  "CPU0: insufficient dynamic memory for a request of 2048 bytes"
  "Console heap space will be automatically increased in size by 256KB"
- Removed unnecessary warning messages "PRLO has a null sb - Issuing LOGO" and "PRLI has a null sb - Issuing LOGO", will no longer be seen on a large Storage Array Network Removed unnecessary warning message "PRLO has a null sb - Issuing LOGO" and "PRLI has a null sb - Issuing LOGO", will no longer be seen on a large Storage Array Network. The message was seen large Storage Array Networks (e.g. first seen on a site with 50 terabytes of storage with lots of kgpsa adapters and switches). (e.g. first seen on a site with 50 terabytes of storage with lots of kgpsa adapters and switches).

Option Firmware

KGPSA-BA firmware updated to revision 3.20x7. This firmware replaces revision kg7303a1.

10.12 V6.1 November 2001

SRM

PALCode – OpenVMS V1.93, UNIX 1.88 – new flag to control reporting correctable-read-data interrupts with c_stat = 0. The address of this flag is at per_cpu + offset 0x3c8. Use the info 5 command to get the per_cpu address. Deposit a 1 to this address to enable this flag. Deposit a zero to disable flag. This flag is mainly used for low-level debugging.

Adaptec driver – firmware upgrade to CHIM V3.62

Change default protection to read-only on SRM flash ROM segment

LFU Firmware Update support for the LP9002 Fibre Channel Controller

DE602-B* console recognition for DE602-BA, DE602-BB. Both cards use the same NIC chip but use different PCI Bridge chips. The DE602-BB uses the Intel 21154-BE bridge chip.

Bugs fixed

KGPSA - Fixed a problem where after a system completed a very large number of reboots without the system being initialized, the system would show that the device was not "connected".

KZPEA - With versions prior to V6.1 it was necessary to set the SCSI_ID twice, once from the console by setting "pka*_host_id" where "*" is the adapter number and once by using the bios utility accessed by "run bios pk*0" where "*" is the adapter letter of the first port on the card. The SCSI_ID should now only be set with the bios utility but can be examined by "show pk*". Please refer to section 6 on known anomalies.

Adaptec drive

redundant de-allocation of OSMIOB buffer corrupted free buffer free list

Not enough OSMIOB buffers caused the driver to hang

Improper free of target control structure caused memory free error

Drives on a starlite shelf do respond to scsi select after a scsi reset until after a delay

Galaxy

Access violations on partition-one (V6.0 firmware only)

Correctly partition memory when greater than 10Gb

AlphaStation ES40 banner not enabled (V6.0 firmware only)

Added SMM value to support EV68 CPU. The SMM value is used by the operating system to verify the system type. Running third party application may require a license adjustment when changing the system type such as when doing a CPU upgrade.

PBXDA-AC (Rev.F Module) – causes console hang in V6.0 firmware)

Fibre Channel driver – remove duplicate tags

SROM, RMC, AlphaBIOS and TIG Firmware – no changes on ES40

RMC on ES40cv system

- New RMC version F2.8 has a range tolerance increase for the Negative 12 Volt warning threshold to 25% (-12V warning).

RMC on TS40/TS20 system

- New RMC version G2.8 for the TS40/TS20 system has the following changes:

Fans - CPU fans are set to be Fans 5 & 6, PCI fans are set to be Fans 1 & 2. They also have a new shutdown delay on the firmware of approximately 3 minutes whenever there is at least 1 PCI fan failure

10.13 V6.0 May 2001

SRM

New PALCode to support EV67 pass 2.6, EV68A pass 2.2 and EV68CB Pass 2.4 CPUs

Console recognition of the Compaq AXL300 Secure Socket Layer [SSL] Accelerator Card

Console recognition of the DE602-BA Ethernet card, which supports the DE602-TA (twisted-pair) and DE602-FA (fiber) daughter cards. Note however, the DE600-AA however supports only the DE602-FA.

Full disable of USB support

Bug fix - Probe Timeout failures on KGPSA devices - While configuring the KGPSA disks with WWIDMGR commands or booting those disks, messages containing "probe timeout" resulted in loss of access to disks needed for booting or writing crash dumps. The console now continues probing when unresponsive nodes are encountered. These nodes are usually other host adapters on systems that are initializing. When this occurs the message "probe timeout retry" indicates that an unresponsive node has been skipped.

Bug fix - possible incorrect fru data when invoking the build_fru command and system_serial_number environment variable contains a null value. All systems should have an assigned system_serial_number.

RMC

Bug fix – symptom - if power supply PS2 fails, the env command shows “PS2 : OK” because PS1 status bit was used for PS2 status because the RMC used PS1 status bit for PS2.

AlphaBIOS.

Bug fix – symptom: AlphaBIOS hangs when an Adaptec card is plugged into lower PCI slot number than the VX1/Oxygen graphics card

RMC on ES40LP

Bug fix – symptom - PCI fan 5 - speed setting was not being adjusted properly during system power up, and it remained at high speed

10.14 V5.9 January 2001

OpenVMS and Unix PALCode - improved memory scrubbing, ensure a double bit error detected during a crd flow for any kind of error will be turned into a machine check

SROM V2.12F – improved cache timing for EV68 CPU module. V5.9 is required for EV68.

Loadable Firmware Utility [LFU]

Support updating KGPSA Fibre channel firmware

No longer supports updating CCMAB memory channel firmware.

Console Environment Variables

memory_test – expand to test 128MB when set to “partial” e.g. P00>>> set memory_test partial

pci_parity - previously only checked at console initialization, now checked during system shutdown so that the

appropriate action is taken during an automatic reboot(this was affecting certain 3rd party graphic cards)

new - exx0_tftp_blocksize (e.g. ewa0_tftp_blocksize) – enables a client to negotiate tftp blocksize to allow downloading files between 32MB and 90MB. Blocksize is limited to 512, 1024 and 1450 bytes. Default value is 1024 and switches to 512 bytes when negotiating with servers that do not support rfc.1782 and 1783.

Bug fixes

DE6xx driver - fix auto-negotiate by negotiating the proper setting during a power up

DE60xx/DE5xx driver – fix "slow MOP booting" with KZPCM by setting receive process to one CPU

OpenVMS Galaxy environment – fix OpenVMS induced crash/hang when symbios controller is in partition 1

RMC - during an over temperature warning, if another event changes from bad to good, the RMC may hang (fixed in RMC V2.6)

Console recognition of the FCA-2354 Fibre Channel Host Bus Adapter

10.15 V5.8 August 2000

RMC V2.5 (was V2.4)- Fixes "RMC parser in use" symptom - section 0 above.

SROM V2.11-F (was V2.10-F) - Now supports the 833MHz CPU

Galaxy bugs fixed:

when a secondary galaxy CPU is moved to the other instance the CPU it is moved to either halts or times out depending on SRM version.

lp_mem_size0 is ignored if lp_count is equal to zero

PALCode/CPU Speed Mismatch Checker (new) - See section **Error! Reference source not found.**.

Console commands and environment variables:

Format change for the run bios command - See section 0 above.

New Info command 7 & 8 - to show and clear errors logged in NVRAM - P00>>> info 7 = show error log , info 8 = clear error log

New console environment variable - sys_com1_rmc - section 5.11.2 above.

Console environment variable boot_reset is now enabled to indicated whether or not to init the system in response to a boot command. e.g. P00>>> set boot_reset on

Loadable Firmware Utility now searches for firmware from multiple CD drives

10.16V5.7 March 2000

This document includes release notes for AlphaServer ES40cv and AlphaServer ES40lp systems in section 0.

New Console Commands:

The show bios command lists the location of each BIOS expansion ROM in the system. The run bios command

invokes an individual BIOS expansion ROM on the supported adapter. See section 0 for details.

Console support/recognition for:

KZPCC-CE controller - added BIOS support using "show bios" and "run bios" command. The console "show config" command will display the controller as: DPT PM3755 on one line, I2O on the next line.

EV67 CPU Version 2.5 (667Mhz CPU)

Adaptec 7899 Controller which is used on the KZPEA

KZPEA-DB - 64-bit PCI, 2 channel LVD, UltraSCSI3 host bus adapter

Console recognition of the DEGPA-TA - 1000BaseT UTP gigabit Ethernet adapter

Console recognition of the Ensoniq sound card

Loadable firmware utility [LFU] - enhanced to look for firmware from multiple CD drives

DQ driver modified to read from multiple CD drives (e.g. for NHD3 kits)

RMC V2.4 - to improve power sequencing, improve voltage tolerance monitoring to +/ 15%, fix fan5/fan6 sensing problem that was only in RMC V2.3

DEFPA option firmware is now V3.20. This version has auto detect for DRAM parity support. If the parity DRAM is present, the DRAM parity code is enabled. Otherwise it is left off.

The console exer command is no longer limited to exercising a maximum of thirty disk drives.

10.17 V5.6 December 1999

Support for:

EV6 CPU Version 2.5 (V5.6 firmware is compatible with previous EV6 CPU versions)

DS-KZPCC-CE (64-bit PCI to three channel LVD Ultra2 SCSI backplane RAID controller) - the console now contains an X86 bios emulator to support this controller.

DS-KGPSA-CA (64-bit PCI to Fibre Channel host bus adapter w/embedded optical) (a.k.a. LP8000)

DS-KZPEA-DP (Adaptec AHA3690DU controller)

The SRM console will recognize 1GB because the memzone limit is 1GB.

Memory exerciser splits up testing of large sections of memory into multiple smaller sections to test and start a memtest on each. This may show up as multiple memtests showing up in the show_status output.

SRM console - fixed frame of fatal 680 delivered to OS through HWRPB

Unix PALCode fix for simple-lock-timeouts seen under Tru64 Unix

Several changes to the RMC and the SROM. Be sure to update both RMC and SROM firmware in addition to the SRM and AlphaBIOS firmware.

Loadable Firmware Utility modified to list and update SRM, AlphaBIOS, and SROM in LFU is first invoked. RMC firmware is still updated in LFU-manual-mode. Be sure to update the RMC. See appendix for example.

Elsa Gloria Synergy graphics cards - console driver fix to refresh graphics display. SRM console is displayed when the Halt button is pressed while the system is running Tru64 Unix..

KGPSA Driver now has the ability to format the on board NVRAM.

10.18 V5.5 - First Console Release

V5.5 was the first official release. August 1999

Console recognition of ATM adapters: DAPBA-FA, DAPBA-UA, DAPCA-FA

Console recognition of Ethernet cards: DE600-AA, DE602-AA/FA/TA. The DE602-FA and the DE602–TA are "daughter cards" which plug into a DE602-AA

Console Boot Support for DE600/DE602 Ethernet cards

New Console Environment Variable - FFAUTO and FFNEXT