Scope

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

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

Golden Rules

Update all console firmware before installing or updating an operating system to ensure compatibility. Console firmware for this server consists of SRM, FSB, RMC, SROM, and TIG firmware. Ensure firmware is updated to the latest revision level.

AlphaServer systems recently shipped may have a higher console firmware revision than the firmware revision listed in this release. A higher firmware revision normally indicates support for the installed operating system.

It is not recommended to load firmware that is older than what is presently installed.

References

<table>
<thead>
<tr>
<th></th>
<th>Order Number: EK-DS250-UGA01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner’s Guide</td>
<td></td>
</tr>
<tr>
<td>Service Manual</td>
<td>Order Number: EK-DS250-SVA01</td>
</tr>
<tr>
<td>Firmware Main Page</td>
<td><a href="http://www.hp.com">http://www.hp.com</a>, click on Large Enterprise Business, click on Server, click on HP AlphaServer Systems, click on firmware</td>
</tr>
<tr>
<td>Alpha Systems Support</td>
<td><a href="http://h20000.www2.hp.com/bizsupport/TechSupport/Home.jsp">http://h20000.www2.hp.com/bizsupport/TechSupport/Home.jsp</a></td>
</tr>
<tr>
<td></td>
<td><a href="http://www1.itrc.hp.com/service/home/home.do">http://www1.itrc.hp.com/service/home/home.do</a></td>
</tr>
</tbody>
</table>

hp Alpha Retain Trust Program

The hp Alpha Retain Trust Program underscores HP’s commitment to providing long-term business continuity for Alpha Systems 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.
Read Me First

Changes This Release

V7.3 firmware was released to CD in April 2007. Since then, I/O option firmware for the KZPEC has been updated. This firmware is available in the firmware .iso image that is downloadable from the firmware website.

**Keyboard driver** - a USB keyboard, attached to a USB-to-PS/2 adapter, can sometimes hang when attempting to login to OpenVMS for the first time. Solution: Read the keyboard data and status registers immediately after enabling keyboard interrupts, to drain any interrupts from the device.

**Kgpsa driver** - on certain new Brocade fibre-channel switches, the console can fail to login to the fabric switch port if the connection is moved from one switch port to another. Solution: When attempting to login to a fibre-channel switch port, use an SDID of zero and the switch will provide the new SDID to the host adapter.

**Wwidmgr** - the console supports a number of environmental variables to facilitate boot and crash dump to fibre-channel storage volumes. Presently there are four (4) WWIDx variables that define the world-wide-ID of a storage volume and eight (8) Nx variables that define the path to the storage volumes. The console uses these variables to define the volumes used for boot or crash dump devices. Solution: Increase the number of Nx (16) and WWIDx (8) console environmental variables.

**RMC firmware** - When a power supply is replaced, the RMC would sometimes report that it is still bad. Solution: Handle cases where an interrupt may be ignored.

**I/O Option Firmware** - no changes at time of firmware CD release. However, KZPEC firmware was updated after the firmware CD release. It is available from the website.
Console and OS Revisions

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>OpenVMS</td>
<td>V8.2</td>
</tr>
<tr>
<td>Tru64 UNIX</td>
<td>V5.1B</td>
</tr>
<tr>
<td>Red Hat Linux for Alpha</td>
<td>V7.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PalCode</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>OpenVMS</td>
<td>V1.98-43</td>
</tr>
<tr>
<td>Tru64Unix</td>
<td>1.92-33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Console Firmware</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRM</td>
<td>V7.3-2 *</td>
</tr>
<tr>
<td>FSB</td>
<td>V7.3-3 *</td>
</tr>
<tr>
<td>RMC</td>
<td>V1.3 *</td>
</tr>
</tbody>
</table>

An asterisk * indicates a firmware change since the previous release.

I/O Adapter Firmware Revisions

The following table list the firmware revision of I/O adapters that are updatable from the loadable firmware utility. There were no I/O adapter firmware changes this release.

<table>
<thead>
<tr>
<th>I/O Adapter</th>
<th>Revision</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIBCA-BA</td>
<td>4.20</td>
<td>PCI to Cl Host Bus Adapter</td>
</tr>
<tr>
<td>DEFPA-AC, DC, MC, UC</td>
<td>3.20</td>
<td>Universe PCI to FDDI Adapter</td>
</tr>
<tr>
<td>DS-KGPSA-CA</td>
<td>CS3.93a0</td>
<td>LP8000 , 1GB, 64-bit/33MHz PCI Fiber Channel Host Bus Adapter</td>
</tr>
<tr>
<td>DS-KGPSA-DA</td>
<td>DS3.93a0</td>
<td>LP9002, 2Gb, 64-bit/66MHz PCI Fibre Channel Host Bus Adapter</td>
</tr>
<tr>
<td>DS-KGPSA-EA</td>
<td>HD191x6</td>
<td>LP9802, LP9802 2Gb, 64-bit/133MHz PCI-X to Fibre Channel Host Bus Adapter (FCA2354)</td>
</tr>
<tr>
<td>DS-A5132-AA</td>
<td>TS1.91X6</td>
<td>LP10000</td>
</tr>
<tr>
<td>DS-A5134-AA</td>
<td></td>
<td>LP10000DC (FCA2684)/ (FCA2684DC)</td>
</tr>
<tr>
<td>KZPCC</td>
<td>CQ17</td>
<td>SMOR Utility revision 1.12</td>
</tr>
<tr>
<td>KZPDC-DE, -DF</td>
<td>3.56</td>
<td>SmartArray 5302A, 5304A</td>
</tr>
<tr>
<td>KZPEC</td>
<td>2.58 on CD</td>
<td>Revision 2.76 became available after the firmware CD release. To get this version, download the.iso image from the firmware page and create a bootable CD. Boot the CD to invoke the LFU, then update the I/O firmware.</td>
</tr>
<tr>
<td>KZPSA</td>
<td>A12</td>
<td></td>
</tr>
</tbody>
</table>

An asterisk * indicates a firmware change since the previous console release.
Helpful Hints

Console Bios Commands

The console `show bios` and `run bios` commands can be run only from a serial console terminal. 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.

Note also, the `run bios` command from the graphics console when connected through the KVM switch is not supported, and will result in unexpected keyboard behavior. Use the SRM `run bios` command only rom the serial console via a serial port connection.

Show Bios

The `show bios` command will lists the location of controllers with a BIOS expansion ROM. The `show bios` command will reset the I/O buses. Note that not all controllers have a BIOS expansion ROM. The command format is as follows:

```
P00>>> show bios <hose>
```

The value for `<hose>` can be 0 or 1, and the default is 0. Use the `show config` command to determine the controller location.

Run Bios

The `run bios` command will invoke a BIOS expansion ROM on a supported PCI controller (for example, 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. The command format is as follows:

First use the `show config` command to determine which hose the controller is located on. Then invoke the command: `P00>>> run bios [controller name]` for example, `P00>>> run bios pka0`

The `run bios` command will reset the PCI bus then prompts the user to enter a control sequence (for example, 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.

FRU Table Notes

Clearing Error Flags

To clear FRU-table error flags, use the following sequence of commands after the console prompt `>>>`

1. Display the fru table to list any error flags. `>>> show fru`
Helpful Hints

2. Record the system serial number. >>> show sys_serial_num
3. Clear errors >>> clear_error all
4. Restore system serial number >>> set system_serial xxxxxxxxxx
5. Initialize or press Reset button >>> init

It is recommended to use this command sequence after adding CPU’s to the system, to avoid a serial number mismatch report from the SRM show error command.

Buildfru -m Command - Used for Power Supplies Only

SRM Console V6.2 and greater supports the `buildfru -m` command to update FRU information for power supplies. The `buildfru -m` command assumes a correctly programmed power supply FRU ROM to begin with and can only be used to update the part number or serial number. The command format is as follows:

```
P00>>> buildfru -m pwr<0 or 1 or 2> part-number serial-number
P00>>> init
```

For example:

```
P00>>> buildfru -m pwr0 30-49448-01.C05 AY11223344
P00>>> init
```

The buildfru -m command should not be used for other devices.
**Selected Console Commands**

**Set User_def1 or User_def2**

Starting with the V7.0 firmware release, console environment variables `user_def1` and `user_def2` were added for customer use. They are non-volatile environment variables that are readable and writable from the SRM console and accessible the Tru64 operating system.

<table>
<thead>
<tr>
<th>Format</th>
<th>P00&gt;&gt;&gt; set user_def&lt;1 or 2&gt; “any character string”</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRM console example</td>
<td>P00&gt;&gt;&gt; set user_def1 “asset no.1234 system location: green zone”</td>
</tr>
<tr>
<td>Tru64UNIX console example</td>
<td># consver -g user_def1</td>
</tr>
<tr>
<td></td>
<td>user_def1 = System_Asset_No: 1234, System_Location: green-zone</td>
</tr>
</tbody>
</table>

Only a limited set of console environment variables are accessible from operating system.

**Set Memory_Test**

The `memory_test` environment variable [EV] allows the console to test a fixed amount or memory. The default value of `full` is to test all of memory. The other values shown are used for testing only:

- P00>>> set memory_test full ; test all memory (default value)
- P00>>> set memory_test partial ; test 128MB memory (for mfg use only)
- P00>>> set memory_test none ; test 32MB memory (for mfg use only)

The `memory_test` EV should be set to the `default value` before booting an operating system.

**Set CPU_Enabled**

The SRM environment variable `cpu_enabled` is set to a default mask value of F to enable all CPU’s. Use the `init` command after changing the cpu_enabled mask value. Also, press the `Reset` button on the operator control panel before booting an Operating System. This will avoid seeing a CPU-timeout informational message on the CPU(s) that were disabled. For example changing cpu_enabled, on a four-CPU system, from F to 0 will disable cpu1-3, after typing init.

Without resetting the system, OpenVMS may report the informational message: “one CPU active and three CPU's are in Timeout”
Helpful Hints

Set Com1_Mode

When `com1_mode` is set to `firm_bypass` and external power is removed then later restored, the value of `com1_mode` will change to its default value.

P00>>> `set com1_mode through`.

The table below lists `com1_mode` value combinations.

<table>
<thead>
<tr>
<th>Current Value</th>
<th>Value after external power is removed and restored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through (default)</td>
<td>Through</td>
</tr>
<tr>
<td>Local</td>
<td>Local</td>
</tr>
<tr>
<td>Snoop</td>
<td>Snoop</td>
</tr>
<tr>
<td>Soft_bypass</td>
<td>Snoop</td>
</tr>
<tr>
<td>Firm_bypass</td>
<td>Through</td>
</tr>
</tbody>
</table>

Before Invoking the LFU Command

After shutting down the Operating System, you must type the `init` command before typing the `lfu` command. The `init` command will initialize the memory allocation regions to their correct console state.

Unplugging Power

After removing power from one of the power supplies, wait at least thirty seconds after the `green leds` turn off before restoring power. The wait will ensure correct status is displayed in the operator control panel [OCP] by the SRM `show power` command and by the 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. Also if you are at console mode while replacing power supplies, press the RESET button before booting an Operating System.

DE602-BA -BB Identification

The SRM `show config` command displays `DE602-B*` for the DE602-BA and/or the DE602-BB Ethernet cards because both cards use the same Ethernet chip but have different PCI Bridge chips. Use the show config command to identify the `21154-BE` PCI Bridge chip which is used only on the DE602-BB.
Firmware Update Procedure

The firmware update procedure uses the loadable firmware update [LFU]. The LFU is invoked by booting the Alpha Systems Firmware CD. You can create a bootable firmware CD from the .iso image available on the firmware web site. Note that updating firmware from DVD is not supported.

Update Firmware from CD

This is the procedure to update firmware from the Alpha Systems Firmware CD.

1. Insert firmware CD in the CD drive.
2. Type boot dqa0 to invoke a program which determines the system model and displays the default bootfile for that system.
3. Press the Enter key after the “Bootfile:” prompt to invoke the loadable firmware utility.
4. If RMC or TIG firmware has changed - type exit after the UPD> prompt, otherwise go to step 6.
5. Type Y or yes to switch to LFU Manual update mode. This mode allows updating RMC and TIG firmware.
6. Type the update command to update firmware.
7. Type yes to confirm updating firmware.
8. Type exit to leave the LFU, loads the firmware into flash, and returns to the SRM console prompt. A power cycle is required only of TIG firmware has been updated to a newer version.
The Loadable Firmware Utility

The loadable firmware utility [LFU] has a default update and a manual update mode. In default update mode, SRM, RMC Runtime, SROM, and I/O option firmware can be updated. In manual update mode FSB, RMC Booter, and TIG firmware can also be updated. The LFU List command will display what firmware can be updated.

List Command

The list command displays the memory-loaded firmware images and supported flash ROM's (shown in the Device column). In this example the LFU is in the default update mode. The exit command switches the LFU to manual update mode.

```
UPD> list

<table>
<thead>
<tr>
<th>Device</th>
<th>Current Revision</th>
<th>Filename</th>
<th>Update Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSB</td>
<td>V7.2.3</td>
<td>fsb_fw</td>
<td>V7.3.3</td>
</tr>
<tr>
<td>SRM</td>
<td>V7.2-2</td>
<td>srm_fw</td>
<td>V7.3-2</td>
</tr>
<tr>
<td>srom</td>
<td>V1.4-F</td>
<td>srom_fw</td>
<td>V1.4-G</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cipca_fw</td>
<td>A420</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dfxaa_fw</td>
<td>3.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fca_2354_fw</td>
<td>CS3.93A2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fca_2384_fw</td>
<td>HS1.91X6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fca_2684_fw</td>
<td>TS1.91X6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kgpsa_8k_fw</td>
<td>DS3.93A2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kzpcc_smor</td>
<td>1.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kzpcc_fw</td>
<td>CQ17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kzpdc_fw</td>
<td>3.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kzpsa_fw</td>
<td>A12</td>
</tr>
</tbody>
</table>
```

UPD> exit

Update Command

The update command loads firmware into the device. The following example updates firmware in manual update mode.

```
FIGURE 1. Update Command - Manual Update Mode

UPD> update

Confirm update on:
SRM
rmc
srom
tig [Y/(N)]y

WARNING: updates may take several minutes to complete for each device.
DO NOT ABORT!
```
Using the FailSafe Loader

Using the FailSafe Loader

<table>
<thead>
<tr>
<th></th>
<th>Updating to</th>
<th>Verifying</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FSB</td>
<td>V7.3-3...</td>
<td>V7.3-3...</td>
<td>PASSED</td>
</tr>
<tr>
<td>SRM</td>
<td>V7.3-2...</td>
<td>V7.3-2...</td>
<td>PASSED</td>
</tr>
<tr>
<td>rmc</td>
<td>V2.4...</td>
<td>V2.4...</td>
<td>PASSED</td>
</tr>
<tr>
<td>srom</td>
<td>V1.4-G...</td>
<td>V1.4-G...</td>
<td>PASSED</td>
</tr>
<tr>
<td>tig</td>
<td>2.6...</td>
<td>2.6...</td>
<td>PASSED</td>
</tr>
</tbody>
</table>

UPD> exit

A complete AC power cycle is required only if TIG firmware has been updated with a newer version. (i.e. turn off the system, remove external power, wait three seconds, then restore power)

Using the FailSafe Loader

The fail-safe boot console (FSB) is a utility to recover from possible console firmware corruption (e.g. checksum ROM error). It is a smaller version of the SRM console, and only contains device support for the inboard I/O controllers and for supported Ethernet controllers. The FSB does not execute the power-up self-test script, but it does prompt to use the LFU utility to recover the SRM console image.

The FSB can be invoked automatically or manually (with jumpers) after system power on. The FSB automatically boots when the SROM detects corruption in the SRM console flashrom image The FSB is manually booted if \textit{jumper J8} is in position 1-2 on the system motherboard. System power-on invokes the console SROM to load the FSB console from the system flashrom.

Restoring Firmware

To restore firmware from the FSB SRM prompt, do the following:

1. Boot the Alpha Firmware CD, or other bootable medium to invoke the LFU

2. Update firmware in LFU manual mode, exit the LFU, power down the system and move the FSB jumper back to its default position (if applicable).

\textbf{Make sure to move \textit{jumper J8} to its original default position.}
<table>
<thead>
<tr>
<th>DVD Media</th>
<th>Bootable DVD’s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bootable DVD’s are not supported on all Alpha systems because of a limited memory size architectural restriction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Console Command Sequences</th>
<th>Press Halt Button, Crash Command and Continue Command</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>When the console is in graphics mode, the sequence of pressing the <strong>Halt button</strong> followed by typing the <strong>crash</strong> command then the <strong>continue</strong> command will not work, and cause different behaviors as described below.</td>
</tr>
</tbody>
</table>

**Command Sequence Behavior in an OpenVMS Environment**

Environment: OpenVMS with DW-Motif enabled, SRM console set to graphics mode, and graphics card installed.

Symptom: Pressing the HALT button puts the graphics monitor to a frozen state. You must reset the system to clear this state. Use one of the following solutions to prevent getting into this state.

**Solution1**: Set console to serial mode then type init before booting the operating system.

**Solution2**: Disable DW-MOTIF before pressing the HALT button using the following sequence.

1. Login to OS if you are not already logged in.
2. At the OpenVMS prompt, type: `STOP DECW$SERVER_0`
3. Press and release the HALT Button (if configured for HALT) to SRM console prompt.
4. Type crash
5. Reset the system and reboot the operating system.
   or
6. Continue and resume your DW-MOTIF session by issuing `@sys$startup:decw$startup`, then log out to bring up the DW-MOTIF session.

**Command Sequence Behavior in a Tru64UNIX Environment**

The Tru64Unix environment includes X11 enabled, SRM console set to graphics mode, and a graphics card installed. The symptom occurs when pressing the HALT button, (if configured for HALT), which puts the graphics monitor to a frozen state. You must reset the system to clear this state.
Known Anomalies and Restrictions

Solution1: Set console to serial mode before booting the operating system.
Solution2:
Disable X11 before pressing the HALT button (if configured for HALT)
1. Login to OS if you are not already logged in.
2. Stop X11 by issuing the stop command (#/sbin/init.d/xlogin stop)
3. Press and release the HALT Button (if configured for HALT) to get to SRM console prompt
4. Type the crash command.
5. Reset the system then reboot the operating system.

Bus Slot Restrictions

DEGPA-SA -TA

DEGPA-SA is supported ONLY in PCI SLOTS 1, 2 and 3. The CSC hardware support group has received several reports on “system hangs” or “660 sys machine check with a PCI Write Data Parity Error”, because DEGPA’s were installed in the wrong PCI slot.

DEGPA-TA is supported only in PCI slots: 1, 2, 3, 6, 9, and 10 (not supported in slots 4, 5, 7, 8). The DEGPA-TA used in the ES45 PCI slot 5 configuration can cause PCI Parity Errors that may result in a System Crash and Hangs.

Illegal Memory Channel 2 Configurations

Starting with SRM V6.2, the console displays an illegal configuration message when it detects unsupported hardware revisions of the Memory Channel 2 module (CCMAB-AA). The correlation between hardware revision and SROM revision is shown below. The “show config” command displays only the SROM revision.

<table>
<thead>
<tr>
<th>SROM Revision</th>
<th>Hardware Revision</th>
<th>Is it Supported on ES45</th>
</tr>
</thead>
<tbody>
<tr>
<td>0X24</td>
<td>D02</td>
<td>Supported</td>
</tr>
<tr>
<td>0X23</td>
<td>C03</td>
<td>Not Supported</td>
</tr>
<tr>
<td>0X22</td>
<td>C02</td>
<td>Not Supported</td>
</tr>
</tbody>
</table>

Illegal Configuration Messages from the Console:

“Illegal Configuration - Memory Channel 2 in bus <n> slot <n> - must be revision 24 (hardware rev D02) or higher”.

The message is displayed during system initialization when probing the PCI Bus.

Console V5.9-10 & EV68 CPUs

Console firmware V5.9-10, which was shipped in early systems and recognizes EV68 CPU’s of revision 3.0 and earlier. Console firmware should be updated to the most current release before installing newer revisions of EV68 CPU’s.
Known Anomalies and Restrictions

Serial Number Mismatch

After adding CPU’s to a system, the SRM `show error` command may report a serial number mismatch. (for example, SMBO.CPU1 SYS_SERIAL_NUM Mismatch). Refer to “Clearing Error Flags” on page 8 to clear this message.

Kzpea Notes

Powering Up Attached Storage

When in console mode, use the `init` command after powering up a storage device attached to a KZPEA controller. The `init` command is not necessary when the storage device is powered up at the same time as the rest of the system or when the storage device is powered up with the operating system is already running.

Missing BUS Termination Jumpers Can Hang Console

The KZPEA-DB requires both SCSI buses to be terminated at both ends of the bus to prevent signal degradation. Signal degradation may cause the console to hang probing the controller for information. Verify that the termination jumpers, (J3 and J5) on the host adapter, are installed to enable termination on both channels.

PBXGB-AA

Do Not Use Swap Position Zero

The PBXGB-AA PowerStorm graphics card should be set to position six (1024x768 at 72Mhz). 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.

Mouse and Keyboard

Do Not Hot Swap

Do not hot swap the mouse or keyboard with power on. Disconnecting them with power on may cause electronic damage to the transceivers. Ensure power is off before swapping them. If the system is in console graphics mode, removing the mouse prevents any response from the keyboard, until the mouse is plugged back into the system.

Fibre Channel Notes

Reconfiguring Fibre Channel Switches

To ensure access from a fibre channel switch, a console `init` command is required if a fibre channel cable is moved from one port to another port, or if the cable has been removed and replaced.

Kgpsa Informational Messages

Kgpsa device messages, similar to “retry et pga0.0.0.2.6”, are informational messages only. Retry messages, of this type, result from a device trying to gain access to a busy fibre channel switch. Device access is rejected, which causes the device to retry accessing the switch.
Kgpsa Driver Startup Messages

When the console Kgpsa fiber channel driver starts up, you may see the message, "pga0.0.0.2.4 - Nvram read failed". The message indicates the KGPSA's NVRAM is either un-formatted or is not working properly. The more likely reason is an un-formatted NVRAM.

The console contains a portion of the NVRAM to indicate if the adapter should be initialized to either a Fabric (also known as 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. For more information refer to the wwidmgr user’s manual.

NVRAM Read Failed Message Example

```
>>>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.

>>>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

>>>wwidmgr -show ada
item   adapter                   WWN                  Cur. Topo       Next Topo
[0] pga0.0.0.8.1  1000-0000-c920-05ab            FABRIC
[1] pgb0.0.0.10.1  1000-0000-c921-0ce0            FABRIC
[9999] All of the above.

>>>init

MBX Not Ready

You may see a "*** MBX not ready ***" message when first formatting the NVRAM with the "wwidmgr -set ada" command. Reissuing this command should succeed.

```

>>>wwidmgr -set ada -item 9999 -topo fab
pga0.0.0.6.1 - Nvram read failed.
Reformatting nvram
```
Firmware Change History

V7.2 - June 2006

Console Enhancements

- WWIDMGR change – do not attempt to get a universal device id [UDID] on a Fibre Channel SAN for SCSI Sequential Access devices or for SCSI Media Changer devices (i.e. tape drives, robot arm)
- Added new module naming for the following I/O devices seen under the show config command:
  - DE602-FA/TA (equivalent to –FR/-TR) all devices are displayed as DE602-F*/T*
  - DEGXA-SB/TB (equivalent to –SR/-TR) all devices are displayed as DEGXA-S*/T*
- The I/O devices are Reduction of Hazardous Substance [ROHS] class and are functionally equivalent to their Non-ROHS counterparts.
- Added new part numbers in FRU tree for the RoHS-class Fans, Operator Control Panel [OCP], and Junk I/O module

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

V7.1 - January 2006

Console Enhancement

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

New I/O Option Firmware

- LP10000 - Firmware Revision 1.91A1
- LP9802 - Firmware Revision 1.91A1
- KZPDC - Firmware Revision 3.56
Firmware Change History

- KZPEC - Firmware Revision 2.58 (new option)

V7.0 - June 2005

Console Enhancements

- Two new SRM console environment variables [EV] (user_def1 and user_def1) for customer use. They take a string argument and accepts any characters within double quotes. The EV’s are nonvolatile and are accessible from the Tru64UNIX operating system. They are not accessible from the OpenVMS operating system.
- DEFPA driver - increase driver setup time in the data link layers
- KGPSA and WWIDMGR – increase the number of Nx EV’s
- SmartArray 5300 – fixed serial emulation

V6.9 - November 2004

Console Enhancement

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.

Solution: The console software has been modified to bypass volumes with invalid device ids and log the device id information to the console error log.

V6.8 - August 2004

Console Enhancements

Fibre Channel Driver - 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"

Console Recognition of the following Options

- 3X-DAPBA-FB, 3X-DAPBA –FB/UB Asynchronous Transfer Mode Adapters
- 3X-KPKON-AA Fault Management Control Module

New I/O Option Firmware

- LP8000/KGPSA-B - DS3.92A2
- LP9002 /FCA_2354 - CS3.92A2
Firmware Change History

- LP9802/FCA_2384 - HS1.81A5

V6.7 - May 2004

Console Enhancements or Fixes

- Loadable Firmware Utility - add support to update option firmware for the LP1000 (FCA-2684) Fibre Channel Card
- Console Recognition of three Asynchronous Transfer Mode [ATM] Adapters - 3x-DAPBA-FA, 3x-DAPBA-UA, and 3x-DAPCA-UA
- 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 prevents a stack trace on an OS shutdown if the bootbios is set to a controller not used to boot the operating system.

I/O Option Firmware Changes

- KZPDC option firmware update to version 3.40 (was v2.94)
- LP1000 firmware include in firmware CD

V6.6 - November 2003

Console Enhancements

- Console recognition for the following Gigabit Enet Server NICs”
  - 3X-DEGX-A-SA - PCI-X/PCI to Single-Port MMF
  - 3X-DEGX-A-PS - PCI-X/PS to Single-Port MMF
  - 3X-DEGX-A-TA - PCI-X/PCI to Single-Port UTP

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 to an 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

I/O Option Firmware Changes

- FCA_2384 (LP9802) Firmware revision changed to 1.00x8
Firmware Change History

V6.5 - June 2003
Console Enhancements or Fixes

- Update test scripts to support testing gigabit Ethernet network devices (example ega0)
- Memory Channel 2 driver updated - module configuration register was incorrectly being restored during a system warm restart.

Note

KZPDC disk drives – when using KZPDC disk drives as boot devices, set heap_expand to 2MB. Details are in the Smart Array 5300A Backplane RAID Controllers Installation and Configuration Guide (Manual Number: EK-SA530-IN-A01).

See Know Anomalies with OXYGEN VX1 graphics card when using the HALT button.

V6.4-21 - Feb. 2003
Interim Release
Bug Fixes - Fix incorrect error DIMM reporting on a correctable ECC memory error

V6.4-18 - January 2003
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.

V6.3-5 - Interim Release - October 2002
Interim Release
Bugs fixed:

Problem description: OpenVMS and Tru64 Unix operating systems would possibly fail when installing the license, with an “insufficient license units” error.

The SRM console has been modified to request the correct number of license units for each system configuration. 25 license units for a 1-cpu system and 75 license units for a 2-cpu system.

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

The onboard Gigabit Ethernet device driver has been corrected to re-establish the link during a console callback that attempts to perform I/O on the Gigabit Ethernet device.

Problem description: RCM (Revision Configuration Management) reported incorrect memory controller configuration information for DS25.

The SRM console was modified to store the correct memory controller configuration information in the hardware configuration tree.
V6.3-3 - First Release - August 2002

V6.3-3 is the first official console firmware release for AlphaServer DS25