hp AlphaServer/AlphaStation DS15 & DS15A V7.2Firmware Release Notes and Update Procedures

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1 Scope

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

1.1 Audience

This document is intended for persons 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. The console subsystem for AlphaServer/AlphaStation DS15 consists of SRM, FSB, RMC, SROM, and TIG firmware. Ensure firmware is updated to the latest revision level.

AlphaServer/AlphaStation 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.

Please do not load firmware older than what is presently installed.

1.3 References

Owners Guide	Order Number: EK-DS150-OG.A01
Service Manual	Order Number: EK-DS150-SV.A01
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

1.4 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.

http://www.hp.com/products1/evolution/alpha_retaintrust/

2 Read Me First

2.1 Console Changes this Release

Console Enhancements

- Added RoHS part numbers in FRU tree
- New module naming for the following I/O devices:

  DE602-FA => DE602-F*

  DEGXA-SB/TB => DEGXA-S*/T*

- WWIDMGR code 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)

2.2 Console Firmware Revision Matrix

The following table shows the revisions of the three main components of this firmware release; the OS, PALCode, and Console Firmware. Operating system versions are current at the time of this firmware release. This firmware release is also compatible with earlier operating system versions that support this platform. Newer firmware versions may be required for newer OS versions if noted in the OS release notes.

Table 2-1 Operating System and Firmware Revision Matrix

Operating System	OpenVMS	V8.2
	Tru64 UNIX	V5.1B
PALCode	OpenVMS	V1.98-7
	Tru64 UNIX	V1.92-7
Console Firmware	SRM	V7.2-2 *
	FSB	V7.2-3 *
	RMC Booter / Runtime	V1.1-0 / V1.2-0
	SROM Extended (Flash)	V1.0-1
	SROM FailSafe (non-Flashable)	V1.0-0
	TIG	V1.11
		* indicates firmware chance since previous release

Please upgrade all console firmware to keep your system current in terms of console enhancements, device support, and bug fixes. Please refer to the Operating System Release Notes, which may list exceptions or recommendations.

2.3 I/O Adapter Firmware Revisions

The following table lists the firmware revisions of the LFU-compatible I/O adapters qualified for support on the DS15.

I/O Adapter	Revision		(notes)
DEFPA	3.20		
DS-KGPSA-DA	3.93A0	*	LP9002
DS-KGPSA-EA	1.91X6	*	LP9802
DS-A5132-AA	1.91X6	*	LP10000
DS-A5134-AA	1.91X6	*	LP10000DC
KZPDC	3.56		
KZPEC	2.58		
	* indicates firmware changed since previous release		

3 Firmware Update Procedure

Firmware updates are performed via the Loadable Firmware Update [LFU]. The LFU is invoked mainly by booting the Alpha Systems Firmware CD, may be invoked by booting a platform-specific executable from a BOOTP or a MOP server.

3.1 Update Firmware from CD

1. Insert Firmware CD into the CD drive
2. Type boot dqa0 to invoke program to determine system type and to display the default LFU bootfile for that system
3. Press the Enter key after the "Bootfile:" prompt to invoke the LFU]
4. If RMC or TIG firmware has changed - Type exit after the UPD> prompt , other skip to step 6
5. Type Y or yes to switch to LFU Manual update mode. This mode allows updating RMC and TIG firmware. (see Note)
6. Type update to update all firmware
7. Type yes to confirm updating firmware
8. 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 been updated with a newer version. A power cycle is required for the new firmware to take affect.

3.2 Loadable Firmware Utility Commands

The Loadable Firmware Utility updates console and I/O option firmware. The LFU operates in a default and a manual update mode. Default mode is used update only the SRM, RMC, SROM, and I/O option firmware. Manual mode is used mainly to update FSB, RMC Booter, TIG firmware, but can be used all firmware.

3.2.1 List Example

Use the list command to display memory-loaded images and supported flash ROM's.

```
UPD> list

Device        Current Revision   Filename   Update Revision

SRM             Vx.y-z           srm_fw          V6.6-xx
rt              V1.0-x           rt_fw            V1.0-x
srom            V1.0-x           srom_fw          V1.0-x
                                 fca_2384_fw       HS1.00X8
                                  kzpcc_fw         CQ16
                                 kzpdc_fw         3.40
UPD> exit
 Do you want to do a manual update? [y/(n)] y
            ***** Loadable Firmware Update Utility *****
--------------------------------------------------------------------------------
 Function    Description
--------------------------------------------------------------------------------

 Display     Displays the system's configuration table.
 Exit        Done exit LFU (reset).
 List        Lists the device, revision, firmware name, and update revision.
 Update      Replaces current firmware with loadable data image.
 Verify      Compares loadable and hardware images.
 ? or Help   Scrolls this function table.

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

UPD> list

Device        Current Revision       Filename        Update Revision

FSB             V6.6-x             fsb_fw            V6.6-xx
SRM              V6.6-x             srm_fw             V6.6-xx
booter          V1.0-x             booter_fw          No Update Available
rt              V1.0-x             rt_fw              V1.0-x
srom            V1.0-x             srom_fw            V1.0-x
tig             1.11               tig_fw             1.11
                                   fca_2384_fw         HS1.00X8
                                   kzpcc_fw           CQ16
                                   kzpdc_fw           3.40
UPD>
```

Notice the FSB, TIG and Booter firmware revisions are displayed when in LFU manual update mode. Also note that if the version of the RMC Booter contained in the LFU is the same as the version currently installed on the system, “No Update Available” appears in place of the version number, and the Booter will not be updated. (This is a precaution to avoid inadvertent corruption of the Booter code in the event of a power fail during update).

3.2.2 Update

Type the update command to update SRM, RMC Runtime, SROM Extended, and I/O option firmware. If FSB, RMC Booter or TIG firmware has changed, use manual update mode.

3.2.2.1 Manual Update Mode

```
UPD> exit

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

UPD> update

Confirm update on:

FSB
SRM
booter
rt
srom
tig             [Y/(N)]  y

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

                    DO NOT ABORT!

FSB          Updating to Vx.y-z...  Verifying Vx.y-z...  PASSED
SRM          Updating to Vx.y-z...  Verifying Vx.y-z...  PASSED.
booter       Updating to Vx.y-z...  Verifying Vx.y-z...  PASSED.
rt           Updating to Vx.y-z...  Verifying Vx.y-z...  PASSED.
srom         Updating to Vx.y-z...  Verifying Vx.y-z...  PASSED.
tig          Updating to x.y...          Verifying x.y...     PASSED.Error! Bookmark not defined.

UPD> exit
```

Note: An AC power cycle is required only if TIG firmware has been updated with a newer version., (i.e. turn off the system and pull the power cord from the wall outlet, wait three seconds, then install power cord).

3.3 Using the Fail-Safe Boot SRM Console

The fail-safe boot console [FSB] is a utility to recover from possible console firmware corruption (e.g. checksum ROM error). The FSB is a smaller version of the SRM console and only contains device support for the AlphaServer/AlphaStation DS15 onboard I/O controllers and all SRM supported Ethernet controllers. It does not execute the power-up self-test script, instead, instructs the user to use the LFU utility to recover the SRM console image. The FSB can be invoked automatically or manually after system power on.

- FSB automatically boots when the SROM detects corruption in the SRM console flashrom image
- FSB is manually booted if 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.

To restore firmware from the FSB SRM prompt:

- Boot the Alpha Firmware CD, or other bootable medium to invoke the LFU
- Update firmware in LFU manual mode, power down the system and remove the FSB jumper (if applicable).

4 Helpful Hints

4.1 SRM Console Environment Variables

4.1.1 user_def1 & user_def2

Two SRM console environment variables [ev's] were added in the V7.0 release to support requests to have non-volatile ev's readable and writeable from the SRM console and from the Tru64 operating system.

Format:	P00>>> set user_def<1 or 2> "<any character string>"
SRM console:	P00>>> set user_def1 "System_Asset_No: 123456 , System_Location: Green-Zone"

Tru64 Unix Examples:	# consvar –g user_def1
	user_def1 = System_Asset_No: 123456 , System_Location: Green-Zone
	
	# consvar –s user_def2 "System_Asset_No: 12341234 , System_Location: Red-Zone"
	# consvar –g user_def2
	user_def2 = System_Asset_No: 12341234 , System_Location: Red-Zone
	
	Note: Only certain EVs are accessible from OS

4.2 KGPSA Notes

4.2.1 Messages Similar to "retry ct pga0.0.0.2.6"

SRM 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 fiber channel switch. These retry requests are allowed.

4.2.2 Reconfiguring Fiber Channel Switches

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

4.3 Updating the FRU Table

4.3.1 Clearing Error Flags

Use the following command sequence to clear FRU table TDD/SDD error flags.

>>> show fru	SDD/TDD errors are listed in the E-column of the fru table
>>> show sys_serial_num	Record system serial number
>>> set sys_serial_num " "	Clear system serial number
>>> clear_error all	Clear errors
>>> set sys_serial_num snnnnnnnn	Restore system serial number

4.4 Halt - Continue Sequence

If the operating system is running, issuing a halt via ctrl-p(OpenVMS only), RMC halt, or OCP halt/reset button (if configured to halt), stops the operating system and returns to the SRM console mode. In console mode, the system is running under the control of the SRM. If you do not disturb the machine state after the halt, typing the continue command returns control to the operating system where it left off. If you issue any SRM command that changes hardware state, (e.g. show device command, starting/stopping drivers, etc.), the context of the operating system is lost and it cannot continue. A reboot of the operating system is the only option.

4.5 Memory_Test Environment Variable

The memory_test environment variable [ev] 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 should be used for testing only.

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

>>> set memory_test full
```

5 Known Anomalies and Restrictions

5.1 Halt Button/Crash/Continue Command in Graphics Mode

5.1.1 OpenVMS Environment

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

Symptom: Pressing the HALT button (if configured for HALT) puts the graphics monitor to a frozen state. You must reset the system to clear this state.

Solution1: Set console to serial mode
Solution2: Disable DW-MOTIF before pressing the HALT button (if configured for HALT)

- Login to OS if you are not already logged in.
- $ STOP DECW$SERVER_0
- Press and release the HALT Button (if configured for HALT) to SRM console prompt
- Type crash
- Reset system and reboot VMS
  – OR –
  continue and resume your DW-MOTIF session by issuing @sys$startup:decw$startup, and logging out to bring up the DW-MOTIF session.

5.1.2 Tru64Unix Environment

Environment: Tru64Unix, X11 enabled, SRM console – any version, SRM console is set to “graphics” mode, Video card installed.

Symptom: Pressing the HALT button (if configured for HALT) puts the graphics monitor to a frozen state. You must reset the system to clear this state.

Solution1: Set console to serial mode
Solution2: Disable X11 before pressing the HALT button (if configured for HALT)

- Login to OS if you are not already logged in.
- Stop X11 by issuing #**`/sbin/init.d/xlogin stop`**
- Press and release HALT Button (if configured for HALT) to get to SRM console prompt
- Type crash
- Reset system and reboot Tru64

5.2 KZPEA Notes

5.2.1 Powering Up Attached Storage

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

5.2.2 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 result in the console hanging when trying to probe the controller for information. Verify that the termination jumpers, J3 and J5, on the host adapter are installed to enable termination on both channels.

5.3 Don't Hot Swap the Mouse or Keyboard

Do not hot swap the mouse or keyboard. Disconnecting them while the power is on may cause electronic damage to the transceivers. Ensure power is off when swapping these components.

When the system is in console mode and the SRM console is set to graphics, removing the mouse prevents any response from the keyboard. Response from the keyboard can be reestablished by plugging the mouse back in.

5.4 Fiber Channel KGPSA Driver Startup Messages

When the console fiber 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.

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/archive/doc/wwidmgr_13.pdf

5.4.1 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     FABRIC
[ 1] pgb0.0.0.10.1    1000-0000-c921-0ce0         FABRIC     FABRIC
[9999] All of the above.
>>>init
```

5.4.2 Known Issues

5.4.2.1 MBX Not Ready

You may see a "*** MBX not ready ***" error when 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
*** MBX not ready ***
pgb0.0.0.1.2 - Nvram read failed.
Reformatting nvram

>>>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.


>>>wwidmgr -set ada -item 9999 -topo fab
>>>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.
```

5.4.2.2 No Unit Number Specified

The command "wwidmgr -quickset -item <n>" MUST also have the "-unit" qualifier on the line.

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

This functionality is not working properly, and a -unit MUST be specified."

Re: Wwidmgr Users Guide

5.5 KVM Console Switch Limitations

5.5.1 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 serial port connection.

6 Firmware Change History

6.1 V7.1

Console Enhancements

- RMC runtime firmware updated to recognize DS15A systems
- Increased the Adaptec SCSI support driver number of support targets from 16 to 32
- KGPSA driver changed to do faster retry on PLOGI frames
- Changes to SCSI driver code enhance page and field length checks for SCSI inquiry responses

Bug Fixes

- OpenVMS PALCode – Fix a bug in the i-stream cache fill error handling code that could result in a very rare and unnecessary machine check with an A0 reason code.
- Fix for long EVs (>128 characters) being copied to another EV and causing a console crash

6.2 V7.0

Console Enhancements

- Two new SRM console environment variables [EV] for custom use. The EVs takes a character string argument within double quotes. The EVs are nonvolatile and can also be accessed from the Tru64 operating system. The EVs are not accessible from OpenVMS.
  Details in section: 4
- 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

6.3 V6.9

Bug Fixes and Other

Fibre-channel and WWIDMGR - 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 symptom 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.