



Clipper SRM

Alan Palmeri
Firmware Project Leader

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SRM New Commands

- **buildfru (<fru_name> <part_num> <serial_num> [<model> [<alias>]]**
- fru_name = console name for this FRU
(smb0,cpu0,smb0.mmb1.dimm4,pwr2) - part_num = this is the 2-5-2.4 Digital Part Number. This is a 16 char ASCII field
- serial_num = this is Digital's FRU serial number. It is a 10 char ASCII field
- model - optional this is the model name or number name
- alias - maybe a optional Compaq alias for this module
- **buildfru -s <fru_name> <offset> <byte> [<byte>...]** - the -s option allows a user to dump raw data into the EEROM
- <offset> = in hex specifies the beginning of the byte offset within this EEROM

- **show fru** - displays a table of the FRU in the system. For each FRU we will display part number, serial number, model name, and the SDD/TDD error status.
- **show fru -e** - will display only FRUs with errors
- **show error <fruname>** - will display SDD/TDD error status
If <fruname> is not present all errors will be shown
- **clear error <fruname>** - will clear all SDD/TDD errors. If <fruname> is not present all errors will be cleared
- **show power** - display the status of the power supplies

Galaxy Commands

- **lpinit** - does a console init and starts the second instance
- **migrate -partition <partition_id> [cpu <cpu_id [..]]**
- **set lp_count 1** - if **lp_count > 0** galaxy is enabled
- **create -nv lp_nodes 2** - system as a 2 cluster node
- **create -nv lp_cpu_mask 3** - assigns CPU 0,1 to Logical partition 0

- The following have been added to the examine, deposit
abrom (AlphaBIOS ROM), dpr, eerom, flash, srmrom,
srom. So you can now do a “e dpr:0 -n 10” and
this command will dump 10 bytes from the DPR
starting @ 0
- The following are also added: pcicfg, pciio, pcimem. They
replace the econfig, eport and emem symbols. The format
remains the same, “e pcicfg:hhbbssffoo” h-hose,b-
bus, s-slot, f- function, o-offset.
- The info commands - allow a user to dump the software data
structures in a readable format (machine checks, impure
areas,...)

- **Processor, platform, and OS specific code**
- **Two flavors:**
 - VMS (used by the console)
 - UNIX
- **Handles exceptions and interrupts**
- **Loads machine check logout frames**
- **Initializes certain system registers**
- **Implements OS specific primitive functions**
- **Written in Alpha assembly language**

Error reporting and logging

- We will use the OCP to display startup messages - starting console
 - initializing head
 - lowering IPL
 - create poll - create timer
 - create powerup
 - Probe I/O subsys
 - starting drivers
 - SRM Vx.x-nnn
- OCP displays from Console may be “locked” by RMC
- Uncorrectable machine checks are logged into the DPR
- Double machine check faults are logged into a sector of the Flash ROM.

Error reporting and logging

- During powerup the SRM will examine DPR to see if the SROM and/or RMC has found any problems. These problems will be displayed on powerup.
- Different for Clipper is the 680 Environmental Machine Check This takes the ENV information from the DPR

Machine Chk Logout Frames

- **Correctable Errors** there are 2 types - 620 System correctables and 630 Processor types
- **Uncorrectable Errors** there are also 2 types - 660 system uncorrectables and 670 Processor uncorrectables
- **680 Machine Checks** environmental errors - the information is gathered by the RMC and deposited into the DPR (A0-A8) SRM will then reformat the information and pass it to the OS.

FRU Table

- FRU table is built by the SRM and passed to AlphaBIOS
- There is a pointer in the HWRPB for the FRU table
- The FRU table contains data structures that describe and connect the hardware elements together
- In Clipper the FRU data structures contain the DRP offsets for the EEROM data structures
- FRU V5.0 will be used by Compaq Analyze

Byte #	Size	Description
0-62	63	FRU Specific or Platform Specific
63	1	Checksum for bytes 0 through 62
64 – 71	8	Manufacturers JEDEC ID Code per JEP 106 FRU GenericData in the first 128 bytes is by convention , <i>read-only</i> , and only should be written in manufacturing.
72	1	Manufacturing Location
73-90	18	Manufacturer's Part Number
91-92	2	Revision code
93-94	2	Manufacturing date
95-98	4	Assembly Serial Number
99-125	27	<i>Manufacturing Specific Data</i>
126	1	Revision of <i>read-only</i> data area
127	1	Checksum for bytes 64 through 126
128-137	10	System Serial Number System Specific
138-141	4	SMM Identifier

EEROM Layout

Byte #	Size	Description
142-143	2	Reserved
144-147	4	TDD Log Header FRU Errorlogs Data in the 2 nd 128 bytes is by convention <i>read-write</i> , and is available for applications.
148-163	16	TDD Log Data
164	1	SDD Log Control
165-208	44	SDD Log Block 0
209-252	44	SDD Log Block 1 (or second half of Block 0)
253	1	Reserved
254	1	Revision of <i>read-write</i> area
255	1	Checksum for bytes 128 through 254

Powerup

SROM x1.33 CPU # 00 @ 0450 MHz

SROM program starting

Reloading SROM

SROM x1.34-F CPU # 00 @ 0450 MHz

SROM program starting

Starting secondary on CPU #2

Starting secondary on CPU #3

Memory sizing in progress

Memory configuration in progress

Memory data test in progress

Memory address test in progress

Memory pattern test in progress

Memory thrashing test in progress

Memory initialization

Loading console

Code execution complete (transfer control)

Console Powerup Sequence

OpenVMS PALcode V1.44-1, Digital UNIX PALcode V1.41-1

starting console on CPU 0

initialized idle PCB

initializing semaphores

initializing heap

initial heap 200c0

memory low limit = 13e000

heap = 200c0, 17fc0

initializing driver structures

initializing idle process PID

initializing file system

initializing hardware

initializing timer data structures

lowering IPL

CPU 0 speed is 2.22 ns (450MHz)

Console Powerup Sequence

create dead_eater
create poll
create timer
create powerup
access NVRAM
Memory size 640 MB
testing memory
probe I/O subsystem
probing hose 1, PCI
bus 0, slot 2, function 0 -- pka -- NCR 53C896
bus 0, slot 2, function 1 -- pkb -- NCR 53C896
bus 0, slot 4 -- ewa -- DE500-AA Network Controller
probing hose 0, PCI
probing PCI-to-ISA bridge, bus 1
bus 0, slot 2 -- vga -- DEC PowerStorm
bus 0, slot 15 -- dqa -- Acer Labs M1543C IDE
bus 0, slot 15 -- dqb -- Acer Labs M1543C IDE

Console Powerup Sequence

starting drivers
entering idle loop
initializing keyboard
starting console on CPU 2
initialized idle PCB
initializing idle process PID
lowering IPL
CPU 2 speed is 2.22 ns (450MHz)
create powerup
entering idle loop
starting console on CPU 3
initialized idle PCB
initializing idle process PID
lowering IPL
CPU 3 speed is 2.22 ns (450MHz)
create powerup
initializing GCT/FRU at offset 17a000
AlphaServer Regatta Console X5.4-236, built on Nov 5 1998 at 01:42:13
P00>>>

P00>>>show config

Compaq Computer Corporation

Compaq AlphaServer ES40

Firmware

SRM Console: X5.4-236

ARC Console: 5.68

PALcode: OpenVMS PALcode V1.44-1, Digital UNIX PALcode V1.41-1

Serial Rom: x1.34-F

RMC Rom: T0.3

RMC Flash Rom: X0.7

Processors

CPU 0 Alpha 21264-4 450 MHz 0MB Bcache

CPU 2 Alpha 21264-3 450 MHz 0MB Bcache

CPU 3 Alpha 21264-3 450 MHz 0MB Bcache

Core Logic

Cchip DECchip 21272-CA Rev 9(C4)

Dchip DECchip 21272-DA Rev 2

Pchip 0 DECchip 21272-EA Rev 2

Pchip 1 DECchip 21272-EA Rev 2

Console show config

Memory

Array	Size	Base Address
0	128Mb	0000000020000000
1	512Mb	0000000000000000

640 MB of System Memory

Slot	Option	Hose 0, Bus 0, PCI	
2	DEC PowerStorm		
7	Acer Labs M1543C	Bridge to Bus 1, ISA	
15	Acer Labs M1543C	IDE	
		dqa.0.0.15.0	
		dqb.0.1.15.0	
		dqa0.0.0.15.0	TOSHIBA CD-ROM XM-5702B
19	Acer Labs M1543C USB		
	Option	Hose 0, Bus 1, ISA	
	Floppy	dva0.0.0.1000.0	
Slot	Option	Hose 1, Bus 0, PCI	
2/0	NCR 53C896	pka0.7.0.2.1	SCSI Bus ID 7
		dka0.0.0.2.1	RZ1CB-CS
		dka100.1.0.2.1	RZ1CB-CA
		dka200.2.0.2.1	RZ1CB-CA
2/1	NCR 53C896	pkb0.7.0.102.1	SCSI Bus ID 7
		dkb400.4.0.102.1	RRD46
4	DE500-AA Network Con	ewa0.0.0.4.1	00-00-F8-1F-29-97

Flash ROM Layout

Location	Size	Code
0:FFFF	64 kb	TIG firmware
10000:DFFFF	896 kb	SRM
E0000:FFFFF	64 kb	Double Machine Check
F0000:FFFFFF	64 kb	EEROM (EV's etc..)
100000:11FFFF	128 kb	SROM
120000:1FFFFFF	896 kb	Alpha BIOS

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