OpenVMS
Undocumented Features

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This presentation is NOT a statement of support!

- undocumented
- unsupported
- subject to change without notice
- subject to removal without notice
- please don't even THINK of calling the support center!
- and please don't ask for the [un]documentation!
• **This is a technical session**

• Target Audience:
  – OpenVMS Programmers, System Managers

• Some OpenVMS Familiarity is Assumed:
  – User Commands
  – System Management Commands
  – Programming APIs
OpenVMS System Disk Structure

Traditional Structure
• WRITEBOOT and SETBOOT go single-architecture
EFI-Compatible Structure

- EFI locates FAT-format boot partition
**EFI-Compatible Structure**

- GPT bootstraps required the relocation of home block and changing the file containing the boot block
- [000000]INDEXF.SYS and [000000]GPT.SYS

![Diagram showing MBR & GPT, SYS$EFI.SYS, GPT]
**OpenVMS System Disk Structure**

**Hardware Diagnostics Partition**

- SYS$MAINTENANCE:SYS$DIAGNOSTICS.SYS
- If partitions are deleted, relocated or modified, do remember to re-invoke SETBOOT

more (related) material later...

<table>
<thead>
<tr>
<th>MBR &amp; GPT</th>
<th>SYS$DIAG*</th>
<th>SYS$EFI.SYS</th>
<th>GPT</th>
</tr>
</thead>
</table>
Watching SETBOOT activity...

- SYS$SETBOOT_DEBUG
  - DEFINE SYS$SETBOOT_DEBUG 1F

- Command interfaces
  - SET BOOTBLOCK (doc'd)
  - RUN SYS$SYSTEM:SYS$SETBOOT (doc'd)
  - Foreign-command interface (not doc'd)
Monitoring the XQP

Looking inside application file processing

$ SET WATCH FILE/CLASS=keyword

- ALL
- NONE
- ATTRIBUTES
- CONTROL_FUNCTION
- DIRECTORY_OPERATIONS
- DUMP
- ATTACHED
- MAJOR_FUNCTION
- QUOTA_OPERATIONS
SET WATCH can display File Identifications (FIDs)...

$ DUMP/ID=(x,y,z)$
Kernel Watchpoints

Watching kernel activity on OpenVMS Alpha...

$ HELP/LIBRARY=WP
Undocumented System Services

Encouraging page-faulting...
• `sys$fault_page( StartingVA, ByteLength, PFCByteSize)`
Generating password-related word strings...

• sys$forge_word( minlen, maxlen, mindata, flags, retdata, outlen, outstr)
Undocumented System Services

V7.3-1 and later, on specific platforms...

• sys$get_env_sensors()
  – Example code has been posted to ATW, comp.os.vms
Undocumented Threads

Get per-thread CPU time, non-portable, on OpenVMS Alpha V7.3-2 with PTHREAD V1.0 ECO and later...

extern int
pthread_getcputime_np(pthread_t, struct timespec*);

Status return values:
  0       Success
  EINVAL  NULL cputime parameter
  ESRCH   handle is not a thread
  ENOTSUP can't return CPU time for SCS thread (UNIX only)
  -ESTALE warning that value is out of date (target is running)
Undocumented DCL Commands

RSX-11M Monitor Console Routine RUN command...

• MCR
Undocumented DCL Commands

*Extension interface for the MAIL utility...*

$ MAIL

• SEND/FOREIGN
• SET TRANSPORT
• SHOW TRANSPORT
Undocumented DCL Commands

*Peering into the BACKUP utility...*

$ BACKUP/ANALYZE
Peering into OpenVMS I64 Images
$ SHOW IMAGE
$ SET IMAGE
may yet be documented in OpenVMS I64 and Alpha V8.2, though for use with ELF images only...
Peering into OpenVMS Images

$ analyze/image/out=nl:/select=(ident,link) pascal.exe
$ show symbol analyze*

ANALYZE$ARCHITECTURE = ""
ANALYZE$BUILD_IDENTIFICATION = ""
ANALYZE$FILE_TYPE = ""
ANALYZE$IDENTIFICATION = ""T5.9-2-50E34"
ANALYZE$IMAGE_TYPE = ""
ANALYZE$LINKER_IDENTIFICATION = ""
ANALYZE$LINK_TIME = "25-MAR-2004 13:06:41.01"
ANALYZE$NAME = ""
Semi-documented DCL Commands

Support and documentation is pending...

Simple-minded image identification...

$ CHECKSUM
$ CHECKSUM/IMAGE
  • CHECKSUM$CHECKSUM symbol

Expected to be documented with V8.2
Semi-documented DCL Commands

Support and documentation is pending...

$ SHOW DISPLAY/SYMBOL
  DECW$DISPLAY_NODE
  DECW$DISPLAY_SCREEN
  DECW$DISPLAY_SERVER
  DECW$DISPLAY_TRANSPORT
Support and documentation is pending...

- F$GETENV
  - Around forever, now (finally) documented
  - Also SYS$GETENV (documented)
  - SYS$SETENV (undocumented)
Fun with documented Commands

Clear the screen?

• TYPE/PAGE NLA0:
Fun with documented Commands

Output Redirection?
• @TT/OUTPUT=X.LOG
Fun with documented Commands

TCP/IP V5.4 Scalable Kernel
Within SYSTARTUP_VMS.COM...
$ DEFINE TCPIP$STARTUP_CPU_IMAGES "PERF=ALL"
Fun with undocumented Commands

**BMC System Event Log Full?**

- At the EFI Shell> prompt, enter the command: clearlogs SEL

- OpenVMS I64 now attempts to drain the contents of the SEL into the OpenVMS error log, reducing exposure

- EFI console output (quantity) control command: verbose events

- FAT tools, FTP services, etc
Fun with undocumented Commands

Changing the Login Logo?
• Most any DECwindows CDE release in common use
• DECwindows 1.3-1 and later for DECwindows Motif
  – sys$common:[CDE$DEFAULTS.system. - appconfig.icons.c]decdtlogo.pm
**Universal Serial Bus (USB 1.1)?**

- USB
  - Wheel and Joystick Input
  - Keychain Storage
  - Requires

- Native (and documented) on OpenVMS I64
  - *bootstrap OpenVMS I64 off a (big) key disk!*
  - *some USB1.1 controllers do work on OpenVMS Alpha*
    - `sys$user_config.dat`

- LK463 USB Keyboard
  - includes PS/2 DIN adapter
Latent Features

**IDE bus and ATA and ATAPI devices**

- CD-R/RW
- DVD+R/RW
- DVD-R/RW

- Recording CD media on (and for) OpenVMS
  - SYS$MANAGER:CDRECORD.COM (V7.3-1 and later)
  - LD Logical Disk Driver
  - See OpenVMS FAQ
  - Bootable Optical Media: ATW (9820)
  - Improved support (incl. DVD) possible in V8.3?
**Alpha disassembler**

- set up DCL$PATH or foreign-command symbol
- `srm_check -verbose -dump image.exe`

- Alpha PATCH tools
  - See FAQ
**Latent Features**

**GAWK is available in TCP/IP Services SNMP**

- `sys$common:[syshlp.examples.tcpi.p.snmp]GAWK.EXE_'ARCH'`
Latent Features

**Integrity Management Processor**

- contains Radeon 7000-class graphics
Easter Eggs

*We engineers will have our fun...*

- $ exit 2928
Easter Eggs

*We engineers will have our fun...*

- SEPPUCLU
Easter Eggs

*We engineers will have our fun...*

- SDA> tcpip show bug
- SDA> tcpip show crash
Easter Eggs

Just who is the INFODWARF?
No Support, No Docs, No Commitments

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Call for OpenVMS Freeware

Freeware submission deadline is 8-Nov-2004
http://www.hp.com/go/openvms/freeware/
Where to go for help?

available web resources

http://www.hp.com/go/openvms/
http://www.hp.com/go/openvms/faq/
http://www.hp.com/go/openvms/wizard/
http://www.hp.com/go/openvms/freeware/
http://www.hp.com/go/dspp
Thank You!
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