



OpenVMS Undocumented Features

Stephen Hoffman
HP OpenVMS Engineering
European Technical Update 2004



No Support, No Docs, No Commitments!

This presentation is NOT a statement of support!

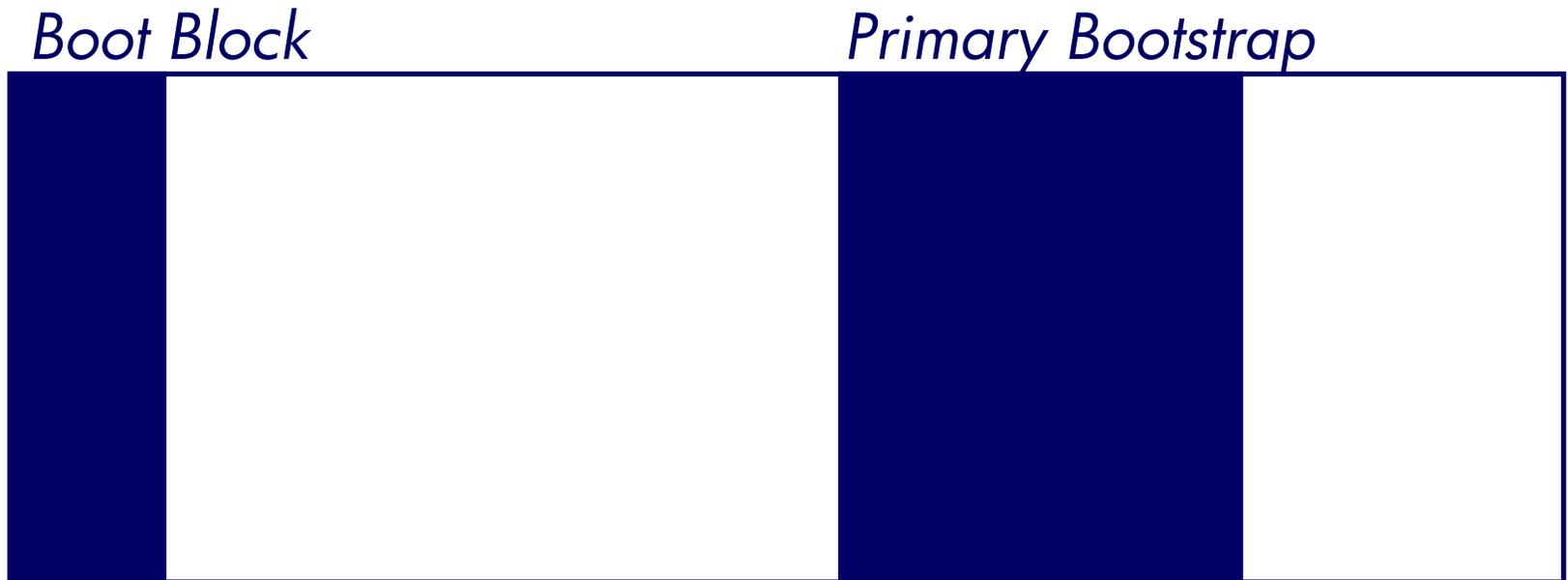
- undocumented
- unsupported
- subject to change without notice
- subject to removal without notice
- *please don't even THINK of calling the support center!*
- *and please don't ask for the [un]documentation!*

- ***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

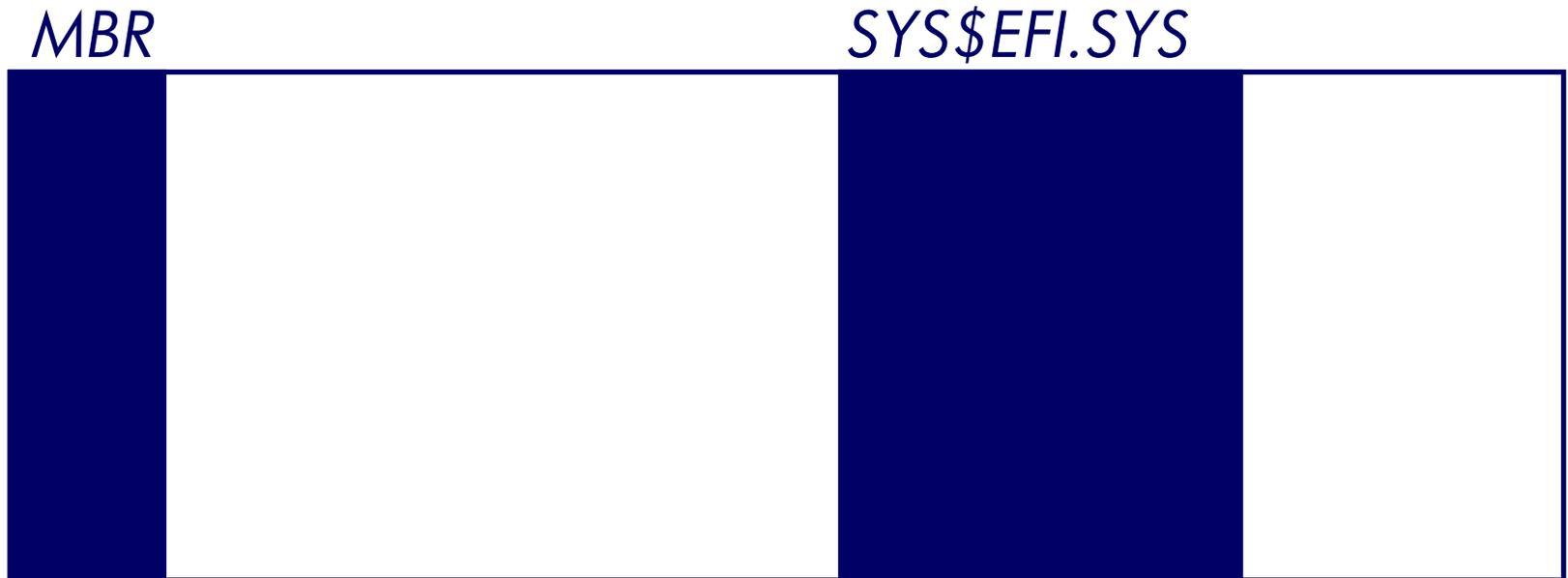
- WRITEBOOT and SETBOOT go single-architecture



OpenVMS System Disk Structure

EFI-Compatible Structure

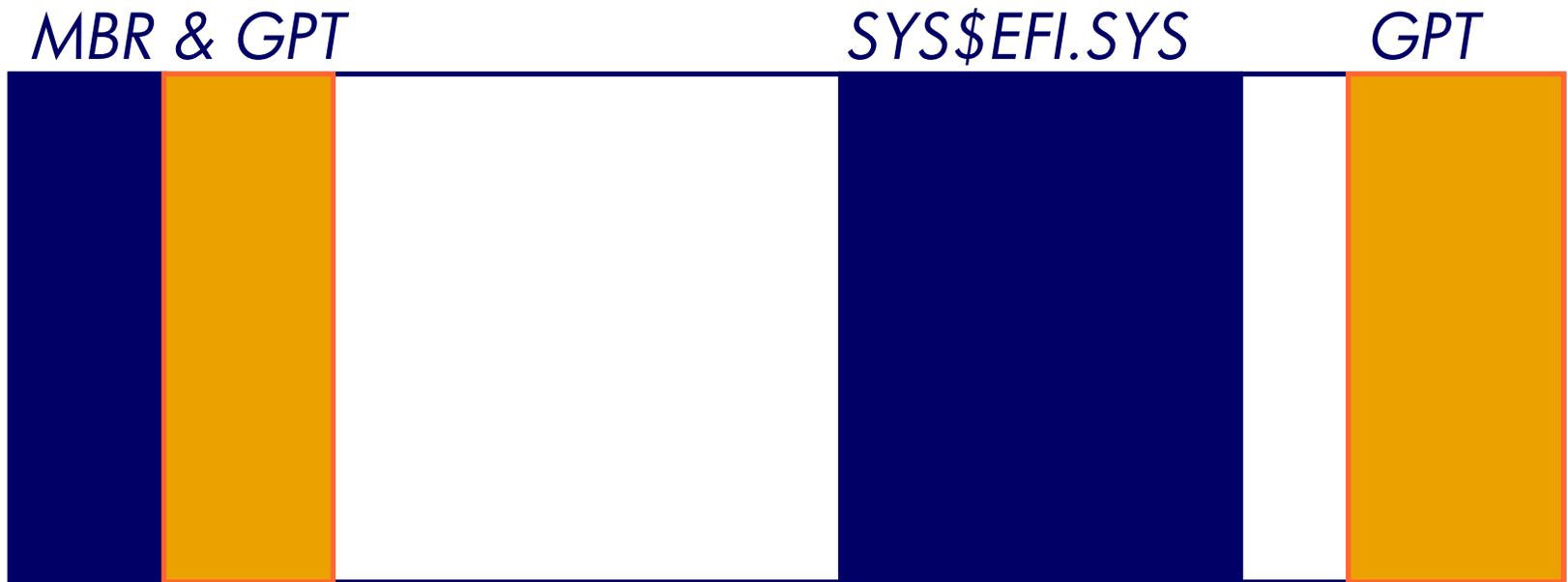
- EFI locates FAT-format boot partition



OpenVMS System Disk Structure

EFI-Compatible Structure

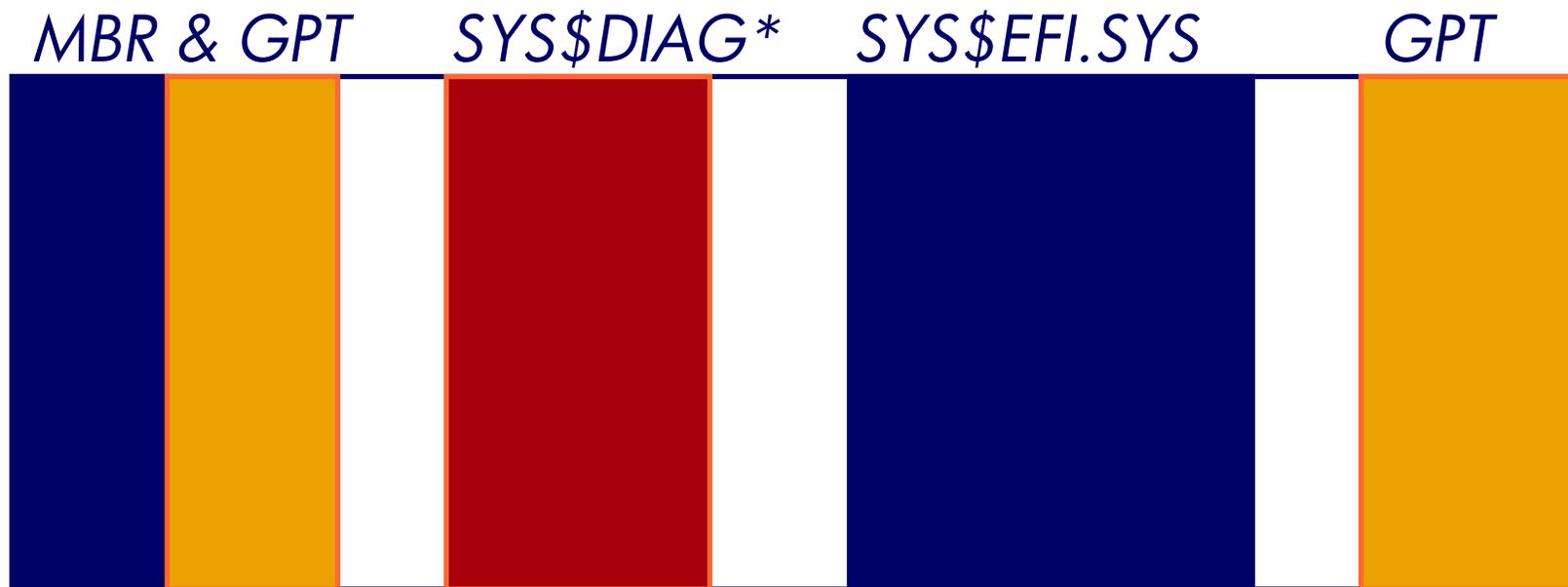
- GPT bootstraps required the relocation of home block and changing the file containing the boot block
- [000000]INDEXF.SYS and [000000]GPT.SYS



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...



SETBOOT

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

Monitoring the XQP

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)`

Undocumented System Services

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

Undocumented DCL Commands

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...

Undocumented DCL Commands

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
```

Semi-documented DCL Commands

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`

Latent Features

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?

Latent Features

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.tcpip.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

This presentation is NOT a statement of support!

- undocumented
- unsupported
- subject to change without notice
- subject to removal without notice
- *don't even THINK of calling the support center!*
- *don't ask for the [un]documentation!*



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!

European Technical Update 2004



Q & A

The Fine Print



- Copyright 2004 Hewlett-Packard Development Company, L.P.
- While HP believes the information included in this presentation is correct as of the date produced, it is subject to change without notice.
- All trademarks and registered trademarks are the property of their respective holders. Intel and Itanium are registered trademarks of Intel.
- Presentation void where taxed or prohibited by law. Title, fees and registration extra, your CPU or I/O mileage may vary.
- Attempts at CD and DVD recording can generate coasters.
- Recommended for technical and engineering ranks and hobbyists ages 12 and up. Ask for special pointy-haired-boss toy.
- Known Thousand-Mile-Stare hazard, please keep this and all other similar presentations away from known-sensitive members of engineering, marketing, and management.



i n v e n t