Rollout of V9.0 and Beyond
May 19, 2020
Agenda

• Business Update
• Virtual Machines
• OpenVMS x86 Rollout Plan
  • Cross Tools Kit (already in place)
  • Initial V9.0 EAK Content
  • V9.0 EAK to V9.1 EAK Evolution
• V9.0 Details
• Getting to V9.2
• V9.2 – stability and performance
VSI Business Update

• Changes for OpenVMS Users
  • V8.4 Standard Support ends December 31, 2020
  • HPE i6 server sales ends December 31, 2020
  • Other Changes

• New Subscription Model
  • Ease into VSI (License / Support) bundles
  • OpEx vs. CapEx

• VSI keeps growing
  • Engineering / Developer Talent
  • Sales & Marketing Talent

• New Community License Program (Fall, 2020)
Virtual Machines
Emphasis on Virtual Machines

Since the very beginning of VMS Software Inc. we have placed heavy emphasis on running in multiple virtual machine environments.

• Many customers want this

• “We run our entire IT operations on VMs except OpenVMS, don’t be different.”

• Near-Term testing focus
  • Virtual Box
  • KVM
  • VMware
Virtual Machine Hypervisors

• We are not “virtualizing OpenVMS” - very misleading terminology
• We are “enhancing OpenVMS” to run in selected VM guests, just as we would for new hardware platforms
• A virtual machine is “just another platform” to OpenVMS
• Platform-specific code, if needed, is loaded during startup
• All virtual machine hypervisors are different, just as all hardware platforms are different (even in the same family)
• Example: Running on Virtual Box does not mean you run on VMware, just as running on i4 did not mean running on i6
Hardware Platform Support

• VSI is not abandoning direct HW platform support
• VSI will test a limited set of systems, for starters
  • HPE and Dell servers
  • Intel and AMD processors
• We will encourage customers to try other platforms and let us know the results
  • We assume there will be issues in most cases and will work with customers where appropriate
  • The problems will usually involve booting the system (UEFI and ACPI), once up most will run with few issues
• Bottom line: HW support will depend largely on the customers
Rollout Plan
Rollout Plan

• Cross Tools Kit
• V9.0 EAK – early rollout
  • 15-May: available for first customer - Software Concepts International (www.sciinc.com)
    • Announcement mail sent at 2:40PM
    • Customer booted and running at 4:20PM
  • 30-May: add 4 more customers
  • 26-June: 5 more
  • 31-July: 5 more
  • Etc.
  • Target: 40 users by the end of 2020
• Add native tools (Cross Tools Kit still available for some time period)
• V9.1 EAK – available to all customers, most system components present
• V9.2 – production release, complete operating environment
• Regular updates from now until V9.2
Cross Tools Kit

- Compile / link on IA64, run on x86
  - V1 - BLISS, C, XMACRO, Linker and associated tools
  - V2 - Updates plus FORTRAN
  - V3 - Updates plus PASCAL
  - COBOL and BASIC in debug / testing now
- Current users providing feedback
- No Cross Tools Kit on Alpha
- VSI has a list of customers and the compilers they need early
- Offering kit to more users when more compilers become available
- No C++
- No JAVA
Initial V9.0 EAK Content

• Early V9.0 is “very rough around the edges”
• Content - intersection between what people need to be productive and what VSI can have ready in a reasonable time
• Initial support for Virtual Box, adding KVM and VMware when fully tested
• All internal operating system functions are present
• Plus - DCL, pipes, RMS, file system, batch system, SDA, AUTOGEN, MOUNT/DISMOUNT, AUTHORIZE, SYSGEN, SYSMAN, BACKUP, DELTA, AUDIT_SERVER, ACCOUNTING, OPCOM, MONITOR, and many more.
• No Layered Products
V9.0 EAK to V9.1 EAK Evolution

• Series of updates to V9.0
  • Each kit will be a complete new installation and/or appliance, not a traditional “Update Kit”
  • New kits will be made available as layered products, compilers, and open source kits are ready

• Offered to more users

• Some customers want to get started even before all of the components needed by their applications are available

• When most system components are present, it will be called V9.1 and available for all
V9.0 Details
V9.0 Proof Points

- Real Boot
  - No special execlets
  - $ DIR returns to $ prompt
  - Boot transitions to system disk
- KVM & VirtualBox booting are equivalent
- Installation from webserver and DVD
- Crash Dumps, SDA
- Conversational Boot –SHOW and SET parameters
- Create User Accounts with AUTHORIZE
- MOUNT/DISMOUNT disks
- Run Batch Jobs
- BACKUP
- Run a threaded (POSIX) application
- TCPIP: FTP, Telnet
- DEBUG - user mode symbolic debugger
What is Not in Initial V9.0 Releases?

- DEBUG (user-mode symbolic debugger)
- DECwindows
- DECnet Phase IV
- DECnet Phase V (OSI)
- Clusters
- Process dumps
- Volume Shadowing
- Reserved Memory
- SMP
- XFC
- INSTALL /RESIDENT

- Support for privileged applications, for example 1) user written device drivers or 2) code that directly calls internal system routines such as those that manage page tables

- No VAX floating point support in the V9.0 cross compilers; all fp is IEEE. For V9.1 native compilers there will be VAXfp except for C++. (NOTE: It is TBD if VAXfp will ever be in C++ for x86.)
User-Visible Differences in V9.0

User-Visible Differences

• Boot Manager
• Dump Kernel
• Microarchitectural Data Sampling (MDS) action notification during startup, e.g. MDS Mitigation active, variant verw(MD_CLEAR)
• Loader warning (-W-) if the image has a ‘Write + Execute’ psect
• 64-bit code addresses in image maps and output displays
API Differences in V9.0

API Differences

- The LINKER default will result in code being loaded into 64-bit space. If you find this to be a problem, use the LINK qualifier /SEGMENT=CODE=P0.
- The $LKWSET system service is problematic on x86. Its uses in an image should be replaced by a single call to LIB$LOCK_IMAGE.
Boot Manager

X86VMS_XFJK [Running]

MESSAGES: PROGRESS SYSBOOT EXECINT SYSAIT ACPI CONFIG DRIVERS
AUTOACTION: BOOT DKA0 0 00000002

DISABLED: Multiprocessor Support

BOOT MANAGER DEVICE: DKA0
DEFAULT BOOT COMMAND: BOOT DKA0 0 00000002

VIRTUAL MACHINE GUEST: VirtualBox (TM) (No Mouse Support, Use Commands or Arrow Keys)
Connect a Terminal Emulator now...
Press <ESC> to stop automatic action or any other key to skip countdown and continue.
S...4...

BOOTMGR> COM 1
   ENABLED: Console output to COM 1

BOOTMGR> DEV

BOOTABLE VMS DEVICES:
   Devices which contain bootable OpenVMS structures.
   DKA0 (HD) = Alias FS0 Label: X86XFJK SATA Disk

BOOTMGR>
Booting from the Memory Disk File

• x86 always boots from the Memory Disk, a file which contains the images needed to get OpenVMS through the early boot path

• Regardless of boot device – physical disk, virtual disk, or network download, a memory disk file is loaded and booting starts

• A switch to accessing the system disk occurs during the boot sequence

• There are no longer boot drivers for all possible boot devices

• The only boot driver is the memory disk driver

• Since there are no longer boot drivers..........
Dump Kernel

• When the system first starts, the Boot Manager
  • Loads and **starts** the Primary Kernel
  • Loads but **does not start** the Dump Kernel (512 MB of memory allocated)

• When a system crash occurs
  • Primary Kernel goes down
  • Boot Manager starts the Dump Kernel
  • Dump Kernel boots, gathers the needed data, writes the crash dump, and halts
  • Boot Manager loads and starts the Primary Kernel and loads the dump kernel

• Dump Kernel is a small subset of the Primary Kernel
  • Runs as a user process
  • Uses standard file system and I/O drivers
From Here to V9.2
Work to Do

• Next Step: End of May update
  • TCPIP
  • Improved quality
  • KVM
  • Standard installation procedure

• Include the “Not in Initial V9.0” components

• Compilers
  • Complete BASIC and COBOL ports and add to Cross Tools Kit within a couple months
  • LLVM (backend code generator)
    • Update to a more recent release
    • Port to OpenVMS
    • Integrate into native x86 compilers
  • Port clang (C++) to OpenVMS

• Build and test layered products and open source kits

• Continuous overall system stress and regression testing
V9.2 – Stability and Performance

• Respond to V9.0 and V9.1 User Feedback
• Stability
  • Regression Tests
  • Stress Tests
  • Continuously add more users
• Performance
  • Trace Buffer Analysis
  • Performance Counters
  • Compiler optimization
  • Storage measurements
  • Network measurements
Short Demo

- Virtual Box Guest Configuration
- Boot Manager
- System startup
- OPCOM, Audit Server
- Batch Queues
- A few interesting commands
- Paging Stress Test & MONITOR
- UETP and SHOW PROCESS
- Force crash, write dump file, and reboot
Thank You

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