HP OpenVMS on Integrity Servers: V8.2 Update

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Agenda

- OpenVMS Strategy
- OpenVMS V8.2 Announcement
- OpenVMS Roadmaps
- Pricing, Licensing, Trade-ins
- New Features in OpenVMS V8.2
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- OpenVMS Strategy
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- New Features in OpenVMS V8.2
“OpenVMS continues to be a strategic platform for HP. This is demonstrated by the new release of OpenVMS Version 8.2... for both Integrity Servers and AlphaServer systems. With OpenVMS now supporting Integrity Servers, we have expanded our multi-OS capability. As well, we are delivering another key offering as part of our Adaptive Enterprise strategy. As your trusted IT advisor, HP is committed to offering the solutions and services... that enable you to be successful... and to capitalize on change.”

Ann Livermore

Executive Vice President
Technology Solutions Group
OpenVMS strategy

- OpenVMS priorities align with HP’s Adaptive Enterprise vision
  - Integrity servers
  - Storage
  - Web Integration Middleware
  - OpenView
  - Printers
  - Virtualization
  - Flexible purchasing
  - Best-in-class services

- OpenVMS Group has met and is on track to meet its roadmap commitments

- Customers, Services, Solutions, and Marketing continue to be key focus areas to help OpenVMS business success
OpenVMS in the Adaptive Enterprise

Adaptive Management
- OpenView
- Insight Manager
- Partner solutions

Virtualization
- Key technology in Adaptive Enterprise

Standardization
- Storage
- Itanium
- Integration
- Open Source
- TCP/IP

Business and IT synchronized

People

Process

Technology
Standardization

• Itanium
  - Industry standard architecture
  - HP’s Enterprise direction
  - Significant HP investment in the Itanium product stack to differentiate from competition
  - Committed direction for VMS
  - Huge benefit for customers in terms of performance, scalability, flexibility and pricing

• Storage
  - NSS (HP’s storage group) is one of the leading vendors in the market
  - Vital component in all customer’s environment
  - Customer feedback tells us to focus on this relationship

• Integration
  - UNIX/LINUX portability
  - Web integration

• Open Source
  - Moving some layered products to Open Source projects
  - Continuing the move towards making the base OS an Open Source Project

• TCP/IP
  - Vital component in all customer’s environment
  - Maintain Networking enhancement / upgrades to support interoperability, connectivity, discovery, and security within the Internet TCP/IP protocol suite.
  - Support critical emerging network related technology as required to support customer operational business model
Virtualization

- Major industry direction – “Enterprises should change their thinking about consolidation and pursue a server virtualization strategy rather than a server consolidation project – Gartner Nov 03”
- Key to HP’s Adaptive Enterprise strategy
- Improve server utilization rates
- Increase server flexibility
- Reduce the overall spending required for servers.
- VMS customers already accustomed to key virtualization technologies (clustering, partitioning, class management etc.)
HP VSE for HP OpenVMS

HP Virtual Server Environment (VSE) - certified and integrated with key partners

Control
- Systems Insight Manager

Availability
- OpenVMS Clusters (all nodes active)
- Disaster Tolerant Clusters, extends to 800 Km
- Volume Shadowing
- Availability Manager

Partitioning
- Hard Partitioning
- Soft Partitioning
- Partition Management SW
- Class Scheduler

Utility Pricing
- OpenVMS iCAP & TiCAP

Future Directions
- ✓ global WLM
- ✓ Mixed Alpha/Integrity Clusters
- ✓ vPars (Galaxy) on Integrity
- ✓ HP Integrity Virtual Machines and Firm Partitioning
- ✓ PPU – Active CPU and Percent CPU
- ✓ Integrity iCAP & TiCAP
HP Integrity Virtual Machines
... optimum utilization across Multi OS

- Sub CPU virtual machines with shared I/O
- Runs on a server or within an nPar
- Dynamic resource allocation built-in
- Resource guarantees as low as 5% CPU granularity
- OS fault and security isolation
- Supports all (current and future) HP Integrity servers
- Designed for multi OS – HP-UX 11i in 2H05, Linux in 1H06, Windows and OpenVMS under investigation
- VSE integration for high availability and utility pricing
Adaptive Management

• OpenView
  _ Widely accepted in the market
  _ The key HP system management offering
  _ At the highest level allows us to offer a single product encompassing most system management requirements
  _ Joint engineering effort with OpenView Group

• Insight Manager
  _ System management
  _ Integrates with OpenView
  _ Available on all HP Servers

• Partner Solutions
  _ Closer working relationships with key partners
    • CA
    • Legato
    • and many more
Adaptive Management: HP OpenView Portfolio OpenVMS Roadmap

- Adaptive Management: HP OpenView Portfolio OpenVMS Roadmap
- OpenView Operations for UNIX
- OpenView Operations for Windows
- OpenView VMS v7 SPI
- OpenView VMS v8 SPI
- OpenView SAM (Storage Area Manager)
- OpenView Storage Provisioner
- OpenView Storage Allocator
- OpenView NNM (Network Node Manager)
- OpenView TEMIP
- OpenView Data Protector
- Radia Software Manager
- Radia Patch Manager
- GlancePlus
- OpenView Performance Agents
- Availability Manager Events (GlancePlus)

- Current
- Not currently planned
- Planned

6/20/05
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Announcing HP OpenVMS v8.2 for AlphaServer systems and Integrity servers

• 1st production release for HP Integrity Servers

• Enhanced functionality for both AlphaServer systems and Integrity servers

  _ Common source code for both architectures
  _ Enables enhancements for both architectures simultaneously
  _ Mixed architecture clusters
### HP AlphaServer evolution...

**sales until 2006, with support through at least 2011**

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**OpenVMS V8.2**
FRS: Feb., 2005
Major New Platform Release: Alpha & Integrity
- First production release for Integrity servers
- Mixed Alpha & Integrity clusters with shared fibre channel storage, up to 16 nodes
- Integrity server support, up to 8 CPU’s
- Standards
- Infrastructure changes to support future new features
- Host Based MiniMerge

**OpenVMS V8.3**
FRS: H1 2006
Platforms: Alpha and Integrity
- Montecito support for Superdome, rx8620 and rx7620
- Performance & Scalability
- Standards: Web Services, Java, Security, UNIX/Linux interoperability
- Hard and soft partitioning
- Expanded mixed Alpha & Integrity cluster support
- Virtualization: PPU, gWLM

**OpenVMS V8.4**
FRS: +12-18 months
Platforms: Alpha and Integrity
- New Integrity systems
- Performance & Scalability
- Standards: security, integration software
- Adaptive Enterprise futures

**OpenVMS V8.n**
FRS: +12-18 months
Platforms: Alpha and Integrity
- New Integrity systems
- Ongoing standards
- Adaptive Enterprise futures

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* Planning phase subject to change
OpenVMS Integrity Clusters Rollout Plan

Version 8.2
- Up to 16 Nodes
  - Expanded Functionality
  - Larger node count qualification during 2005

- Cluster Interconnect
  - Gigabit Ethernet
  - 10/100 Ethernet

V8.2 (Warranted)
V8.2 & V7.3-2 Alpha (Warranted)

Version 8.3
- Full Functionality
  - Cluster Satellite Boot

- Cluster Interconnect
  - Gigabit Ethernet
  - 10/100 Ethernet
  - 10 Gigabit Ethernet*
  - Next-Generation Interconnect – post V8.3

V8.x (Warranted)
V8.x & V8.2 & V7.3-2 Alpha (Migration)

* - If HP Program is Ready

All products, dates, and figures are preliminary and are subject to change without notice.
ISV momentum for HP Integrity

OpenVMS

As of December 2004, 780 applications from 360 partners have been committed to be ported.

Forecast
250 apps ready for January 18
OpenVMS v8.2 Production Launch

215 Apps ready now (December 1st)

As of December 2004, 780 applications from 360 partners have been committed to be ported.
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HP OpenVMS Integrity Packaging

New Operating Environment Options

- HP OpenVMS Mission Critical OE
- HP OpenVMS Enterprise OE
- HP OpenVMS Foundation OE

OE Bundle Benefits:
- Easier to order
- Easier license management
- Straightforward installation of OE’s from a single DVD
- Simpler support contracts
OpenVMS Integrity
Licensing/Packaging

• Operating Environment Licensing:
  - Per Processor Licensing (PPL) model for each operating environment
  - One LMF PAK for each OE bundle purchased.
  - The Foundation Operating Environment (FOE) is required.
  - Component products of the EOE and MCOE are also available separately
  - Delivered on one OE DVD

• HP OpenVMS layered products
  - Per Processor Licensing (PPL)
  - Concurrent Use license for compilers only
  - Products are on the Layered Product Library Media

• Service Update contract changes on Integrity platform:
  - Service Update contract required to receive operating system and/or layered product release updates.
  - Non-service customers are required to repurchase the product license (at full price) to obtain updates.
HP OpenVMS Integrity Packaging

OpenVMS Integrity Foundation Operating Environment

- OpenVMS Operating System
- OpenVMS Unlimited User Licensing
- TCP/IP Services for OpenVMS
- DECnet-Plus for OpenVMS End System
- DECwindows Motif for OpenVMS
- DECnet IV
- Performance Data Collector
- Web Agents
- WEBM / CIM

Integration Technologies

- Secure Web Server (SWS)
- Secure Web Browser (SWB)
- SDK for the Java™ Platform
- XML Technology
- NetBeans
- Simple Object Access Protocol (SOAP) Toolkit
- Kerberos
- Enterprise Directory
- CDSA
- SSL
- OpenSource Tools
OpenVMS Integrity Packageing

OpenVMS Integrity Enterprise Operating Environment

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Add to Foundation:
- RMS journaling
- Volume Shadowing
- DECram
- OpenVMS Management Station
- Availability Manager-AM
- OpenView Performance Agent (H2 2005)

Note: Products listed in yellow are available as separately licensable products outside of OE package if desired.
HP OpenVMS Integrity Packaging

OpenVMS Integrity Mission Critical Operating Environment

OpenVMS Integrity Enterprise Operating Environment

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Add to Foundation:
- RMSjournaling
- VolumeShadowing
- DECrems
- VMS Management Station
- Availability Manager – AM
- OpenView Performance Agent

Add to Enterprise:
- OpenVMS Clusters
- OpenVMS RTR Backend

Note: Products listed in yellow are available as separately licensable products outside of OE package if desired.

One DVD media for all 3 OE’s
OpenVMS Integrity OE Phased Rollout

Foundation Operating Environment (FOE)
- OpenVMS Operating System
  - w/ unlimited users
- TCP/IP Services
- DECnet-Plus End System
- Decnet Phase IV
- DECwindows Motif
- Secure Web Server
- Secure Web Browser
- Java SDK
- Netbeans
- XML Technology
- SOAP Toolkit
- Enterprise Directory
- Kerberos & CDSA
- SSL (Secure Socket Layer)
- TDC2 Data Collector
- WEBM/CIM & Web Agents

Enterprise Operating Environment (EOE)
- RMS Journaling
- Volume Shadowing
- DECram
- Management Station
- Availability Manager

Mission Critical Operating Environment (MCOE)
- Reliable Transaction Router – Backend
- OpenVMS Clusters

Current plans, subject to change

Feb 2005 Q2 2005 Q3 2005 H2 2005
Example: per processor licensing for OpenVMS on Integrity servers

- Pay based on number of CPUs and the level of OE
- When you need more processing you buy processors and licenses for them.
- Benefits
  - Greater RoIT
  - **More granular** – pay only for what you need
  - **More flexible** – move assets as needed
  - **Accommodates partitioning** – allows use of different types of OEs in different hardware partitions and different Operating Systems
  - **Expandable** – purchase processors and software to meet needs over time

*OpenVMS will support partitioning in 1H2006*
Software Cross Platform Trade-in Policy

<table>
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<tr>
<th>Support Customer</th>
<th>Non-Support Customer</th>
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| • Licenses on support* are traded-in for new licenses at **no charge**  
  • Commitment to continue support* on new licenses for one (1) year |
| • Licenses not on support* are traded-in for new license purchase at **40% of new license price**  
  • Commitment to support* on new licenses for one (1) year, pre-paid |

- Trade-in applies to ‘equivalent product’ or operating environment licenses
- Parallel usage of licenses on both platforms is allowed during transition, consistent with the parallel usage for the hardware

*Support = Service contract with License to Use (which includes right to new versions)
Example: trade-in

OpenVMS for AlphaServer systems

- No Change

OpenVMS for Integrity Servers

- License transfer from AlphaServer or VAX
  - Services contract (with license to use)
    - Even swap at no charge for “equivalent product”
    - Parallel usage for a set period
    - Must purchase at least one year of support
  - No services contract
    - 60% discount on new license price
    - Parallel usage for a set period
    - Must purchase at least one year of support
HP Support Policy

• Unless otherwise agreed to by Hewlett-packard Company (HP), HP provides HP Support Services only for the current and immediately preceding versions of HP software, and only when the software is used with hardware that is included in HP-specified configurations. A version is defined as a release of a software product that contains new features, enhancements, and maintenance updates."

• http://h71000.www7.hp.com/openvms/openvms_supportchart.html
OpenVMS Service Support Roadmap

**VAX**
- **V5.5-2**: Prior Version Support
- **V6.2**: Prior Version Support
- **V7.3**: Standard Support

**Alpha**
- **V6.2x**: Prior Version Support
- **V7.3-1**: Standard Support
- **V7.3-2***: Standard Support
- **V8.2**: Standard Support

*The start date of PVS for V7.3-2 is when V8.3 ships, which is currently H106.*
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System and Hardware Support

Integrity Servers

- OpenVMS V8.2 will support entry-level to mid-range hp Integrity servers:
  - Entry-level Integrity: rx1600 - all CPU speed variants
  - Low-end Integrity server: rx2600 - all CPU speed variants
  - Mid-range Integrity server: rx4640 - all CPU speed variants

Alpha Servers

- Support for new EV7 chip speedup for AlphaServer ES47, ES80, and GS1280
Infrastructure changes

• Some system level data structures have been changed in OpenVMS V8.2 (Alpha and I64)

• Benefits
  _ We’re laying the foundation for scalability and performance improvements in future releases of OpenVMS

• The OpenVMS Philosophy
  _ Try to never break non-privileged images
    • An image linked on early versions of OpenVMS Alpha should run on current versions of OpenVMS Alpha
  _ Only make changes that impact privileged images with the release of a “major” version
    • V6 to V7 introduced 64-Bit Support
Infrastructure changes

• Impact to applications
  _ Non-privileged applications are not affected
  _ Some privileged applications (such as device drivers) will need to be recompiled and relinked
    • Privileged applications in this case are images linked against the system using the /SYSEXE qualifier and reference the changed data structures or related structures and routines
    • Attempting to execute or load such an image that has not been rebuilt will result in an error during image activation of SYSVERDIF – “System Version Mismatch”.
  _ Applications that access the modified data structures in non-standard ways may need to be modified
    • Examples: hard-coded data structure sizes and assumptions about the relative locations of fields within a data structure
General User Features

• DCL Enhancements
  - Various, user requested enhancements to improve usability and manageability
• Enhanced mailbox features
  - Create and delete via DCL
• License Management Facility (LMF)
  - Modified on Integrity Servers to support OE licensing scheme
  - F$LICENSE() DCL lexical function
• MONITOR utility
  - Rewritten in C for performance and maintainability
  - Record formats have been documented for use by applications
General User Features

DCL Enhancements

• Command token size increased to 4k bytes
  _ Enhances DCL command line length added in V7.3-2
• The qualifier /IMAGE has been added to SHOW SYS
• The /GRAND_TOTAL qualifier has been added to DELETE and PURGE
  _ Allows just a total to be seen for delete and purge operations
• The VERSION keyword has been added for SELECT on the DIRECTORY command
  _ version takes a MIN and MAX parameter
  _ Useful tool for detecting files approaching the maximum version limit
  • $ dir sys$sysdevice:[000000...]*. * /select=ver=min=32000
General User Features

DCL Enhancements

Clusterwide logical names

- **SHOW LOGICAL/CLUSTER**
  - Displays all the logical names under the LNM$CLUSTER table.
  - The /full qualifier parses the clusterwide bit in LNMB$L_FLAGS

- **DEFINE/CLUSTER_SYSTEM** and **ASSIGN/CLUSTER_SYSTEM**
  - Defines a logical name in the LNM$SYSCLUSTER table

- **DEASSGIN/CLUSTER_SYSTEM**
  - Deassigns a logical names from the LNM$SYSCLUSTER table
General User Features

DCL Enhancements

- CTRL-T will now provide additional information on COPY, DELETE, and PURGE status
- There are three new qualifiers for search
  - `/WILDCARD_MATCH`
    - If specified, * and % symbols are treated as wildcard operators similar to how DIRECTORY uses these
  - `/SKIP=n`
    - This qualifier will cause search to not display the first n matches
  - `/LIMIT=n`
    - This qualifier will limit the number of matches displayed by search
- The new SHOW FASTPATH command shows information on the fast path devices
  - The `/CPU=(n[,n…])` qualifier will display devices for specific CPUs
General User Features

DCL Enhancements

Mailboxes

• We added support for creating temporary and permanent mailboxes from DCL
• The following qualifiers are supported for creating a mailbox from DCL
  _ /MAILBOX
  _ /PERMANENT (default is NOPERMANENT)
  _ /MESSAGE_SIZE
  _ /BUFFER_SIZE
  _ /PROTECTION
  _ /LOG
General User Features

DCL Enhancements

Mailboxes

- The `/MAILBOX` qualifier has been added to `DELETE`
  - `DELETE/MAILBOX` only marks the mailbox for deletion, the actual deletion of the device will occur when the reference count will drop to 0
- When the `/NOWAIT` qualifier is specified with the `WRITE` command, the `$PUT` service uses the `IO$M_NOW` modifier
  - The operation completes immediately instead of synchronizing with another reader of the mailbox
  - Helps prevent hangs when writing in Supervisor mode when no process is available to read
General User Features

License Enhancements

• LMF
  _ Add support for Integrity OE packages - FOE, EOE, MCOE
  _ Support upgrading/downgrading/changing the content of an OE without reboot on Integrity platforms
  _ New command - SHOW LICENSE/OE, for Integrity platforms
  _ New tools - Compliance manager (produces compliance reports), units assignment tool - help manage and distribute units across the cluster.
  _ Full PAKGEN support for new option keywords
General User Features

License Enhancements

F$LICENSE

- Returns TRUE if the product is licensed to run on the current node
  - Supported only for DEC/CPQ/HP products
- On OpenVMS I64, the lexical function searches the Operating Environment database as well
- Used by VMSINSTAL.COM
  - On I64 logical names are not the way to determine PAK existence
- Additional items codes may be added in the future (units loaded….)
General User Features

Monitor

• The VAX PL/1 code has been converted to C.
  _ Monitor now runs Native on both OpenVMS Alpha and IPF with V8.2
  _ Numerous performance improvements to reduce overhead

• A few fixes have been made
  _ seeing an average higher than a max
  _ seeing more than 100%

• Added a CUR display for MONITOR SYSTEM
  _ Current processes used to be listed as “Other”

• Better internal algorithms for collecting data

• Usage of the SCHED spinlock when collecting various data has been removed

• Heavy alignment faulting has been corrected
General User Features

Monitor Record Formats

- The record format is documented in the OpenVMS System Management Utilities Reference Manual
- There are some customers who read MONITOR data files or utilize the $GETSPI user written service to obtain data from a live system
- The symbols for the record format will now ship as part of the LIB libraries in SYS$LIBRARY
- In addition to the MNRxxx$ symbols, the symbols for pre V8.2 record formats will also exist as MNR_OLDxxx$...
General User Features

Miscellaneous

• Traceback now supports resident images
  _ Helps identify problems with installed images

• Lexical F$FID_TO_NAME
  _ F$FID_TO_NAME is a new DCL lexical to convert a file id to a file name
  • f$fid_to_name( device, file-id )
RAS Features

- Host-based MiniMerge (HBMM)
  - Full merge requires comparing entire shadow set but only blocks with I/O in progress need to be merged

- Extended Value Blocks
  - Increase the size of the OpenVMS Distributed Lock Manager value block from 16 to 64 bytes

- KP Services
  - A standard, supported interface for porting code from VAX or Alpha to Itanium that switches or manipulates stacks

- System Service Logging
  - Mechanism to record information about system service activity
RAS Features

Host-based MiniMerge (HBMM)

• Full merge requires comparing entire shadow set but only blocks with I/O in progress need to be merged

• Host Based Mini Merge (HBMM)
  _ Selected cluster hosts track recent writes using write bitmap
  _ Bitmap is periodically reset to flush out old writes
  _ Contents of bitmap drive mini merge operation
RAS Features

HBMM release plans

- V7.3-2 remedial kit is now available
- Will ship as part of V8.2 Alpha and Itanium
- No plans for VAX support
RAS Features

Extended Value Blocks

• Increase the size of the OpenVMS Distributed Lock Manager value block from 16 to 64 bytes
  - Applications can read and write a value block with the usage of $ENQ, $DEQ, and $GETLKI system services.
  - The contents are maintained coherent across a cluster
  - There is no impact to any existing applications with the addition of this feature
  - Applications can take advantage of the larger value blocks on V8.2, but doing so requires code changes

• Pre V8.2 nodes in a mixed version cluster do not know about extended value blocks
  - Any value block update by a pre V8.2 system will only update 16 bytes.
RAS Features

KP Services

What exactly are these things

- Originally called Kernel Process Services
- Misnamed from the beginning – they are not processes and now they are not exclusively kernel mode
- Conceptually, it’s a procedure that executes on its own stack[s]
- Needed to emulate macro FORK in high level languages when using C to write operating system code

For more info on the original KP implementation see OpenVMS AXP Internals and Data Structures - Chapter 5 “Writing OpenVMS Alpha Device Drivers in C”
RAS Features

KP Services

Why should you use KPs?

• Porting code from VAX or Alpha to Itanium that switches or manipulates stacks

• The Itanium architecture is much more complicated than Alpha and VAX architectures and therefore switching or manipulating stacks is much more complicated and more prone to errors

• IA64 assembler is not for the faint of heart

• KPs provide a standard, supported interface
  - Code can be implemented and debugged on Alpha where tools are more mature then moved to Itanium
RAS Features

KP Services consumers in the base OS

- F11XQP
- RMS (exec mode)
- DCL (supervisor mode)
- DDTM
- DECnet Phase V
- DECdns
- TCP/IP
- MTAACCP

RMS and the XQP run this way on Alpha as well. They were used for the proof of concept.
RAS Features

System Service Logging

- Mechanism to record information about system service activity for:
  - Exec and kernel mode services
  - Execlet and privileged shareable image services
  - a specific process
- Main goal is to aid in troubleshooting
- Information that’s recorded
  - Service identification, Caller of the service request – image and offset, Access mode of requestor, Service arguments, Time stamp, & Completion status
- Display logged information via DCL command
  - ANALYZE/SSL <file>
    - /SUMMARY - summary of System Service usage
    - /SELECT - filter output based on System Service name, image, or both
RAS Features

Miscellaneous

• LAN failover improvements
  - Adds support for DE500 and Jumbo Frame support for gigabit Ethernet
Security Enhancements

- **ACME Login EAK**
  - with LDAP support
- **Kerberos V2.1 for OpenVMS**
  - Based on MIT Kerberos V5 Release 1.2.6
  - Client and Server support on all three hardware platforms
- **SSL V1.2 for OpenVMS**
  - Based on OpenSSL 0.9.7d
  - Support on all three hardware platforms
- **CDSA Secure Delivery**
  - SDK allowing verification of authenticity of downloads and installations of OpenVMS software
- **Buffer Overflow Protection (Integrity Servers only)**
  - Prevents unauthorized code execution by setting no Execute privilege on stack and user allocated pages
Unix Portability (UP)

OpenVMS will be like any other “UNIX flavor” for easy application portability

- Symbolic links
- NFS support
- CRTL – delivering UNIX style API’s on OpenVMS
- File Lock APIs: flockfile(), funlockfile(), ftrylockfile()
- statvfs/fstatvfs
- Standard stat structure
- GNV 1.6 – providing a UNIX style shell and utilities
- vi (vim.org implementation), gnuTAR and configure/Make improvements
- Process Shared Objects
UNIX Portability (UP)

Process-Shared (pshared) Objects

- OpenVMS now supports Process-Shared Mutexes and Process-Shared Condition Variables in addition to Process-Private Mutexes and Condition Variables

- Applications that use pshared objects can be more easily ported to OpenVMS

- New APIs include
  
  _pthread_condattr_getpshared()
  _pthread_condattr_setpshared()
  _pthread_mutexattr_getpshared()
  _pthread_mutexattr_setpshared()
TCPIP V5.5 for OpenVMS V8.2

- Supported on both OpenVMS Alpha and OpenVMS Industry Standard 64 (I64) systems with the same functionality unless otherwise noted
- IPv6 Updates and Enhancements
- failSAFE Support for IPv6
- PWIP Driver Support for IPv6
- NFS Server Supports Case-Sensitive file Lookups
- NFS Symbolic links support
- Support for NTP V4.2
- Support for TCPDUMP Version 3.7.2
- Update to SSH to V3.5.2
NFS Enhancements

Server Case-Sensitive Lookups

- The management ADD EXPORT command has two new options, CASE_BLIND and CASE_SENSITIVE
  - CASE_SENSITIVE enables UNIX-like case sensitivity for NFS server file lookups.
  - For example, NFS would preserve the case in the file names AaBBc.TXT and AABBC.TXT, regarding them as two different files

Symbolic Link Support

- NFS Server supports symbolic links
  - Currently, only UNIX clients can utilize symbolic link support
  - OpenVMS doesn’t yet recognize symbolic links
  - OpenVMS support will be coming in the future
TCP/IP kernel

- Scalable Kernel, which was optional in V5.4, now replaces the standard kernel
- The logical name TCPIP$STARTUP_CPU_IMAGES, which was used to select the alternate Symmetric MultiProcessing (SMP) images, is now ignored
  _Remove the local definition of that logical name_
TCPDUMP and libpcap

- TCPDUMP has been upgraded to V3.7.2
- For more information about the changes in the new version of TCPDUMP, see the [www.tcpdump.org](http://www.tcpdump.org) web site
- libpcap API is provided for Early Adopters
  - An example program is included in the directory pointed to by the logical name TCPIP$LIBPCAP_EXAMPLES
  - The libpcap object library resides in the directory pointed to by the logical name TCPIP$LIBPCAP
    - The directory pointed to by the logical name SYS$SHARE contains an executable file
System Management

• The Data Collector (TDC)
  _ Can be used to gather performance data for systems running V7.3-2 or later
  _ Collect and stores the following types of data
    • Cluster configurations and communications
    • CPU utilization
    • Disk performance
    • System wide performance metrics
    • System parameters
    • Process utilization

• OpenVMS can be managed by OpenView by using the OpenView Operations (OVO) agent
Upgrading OpenVMS Alpha & Integrity Environments

• System Software Upgrade Paths to V8.2
• Alpha Direct Upgrade Paths:
  • V7.3-2 to V8.2
  • V7.3-1 to V8.2
• Integrity Direct Upgrade Paths:
  • Fresh install required
• Cluster Upgrade Paths – Alpha & Integrity
  • Cluster rolling upgrades are supported from V7.3-2
  • Warranted pairs are V8.2/V8.2 and V8.2/V7.3-2
How is OpenVMS performance on Integrity servers?

- **Today**
  - Very favorable compared with similar AlphaServer systems

- **Tomorrow**
  - Integrity continues to improve and benefit from speed-ups
  - Compilers continue to become more efficient
  - OpenVMS continues to improve
For further Information about OpenVMS on Integrity Servers

- General OpenVMS on Integrity Servers
  http://h71000.www7.hp.com/openvms/integrity/index.html

- Layered product rollout schedules

- Layered products plans (products that either will not be ported or are under review)
  http://h71000.www7.hp.com/openvms/integrity/openvms_plans.html

- OpenVMS Partner plans
  http://h71000.www7.hp.com/openvms/integrity/partners.html

- OpenVMS on Integrity Servers Total Cost of Ownership white paper