OpenVMS Update

DECUS Herbsttreffen 2004

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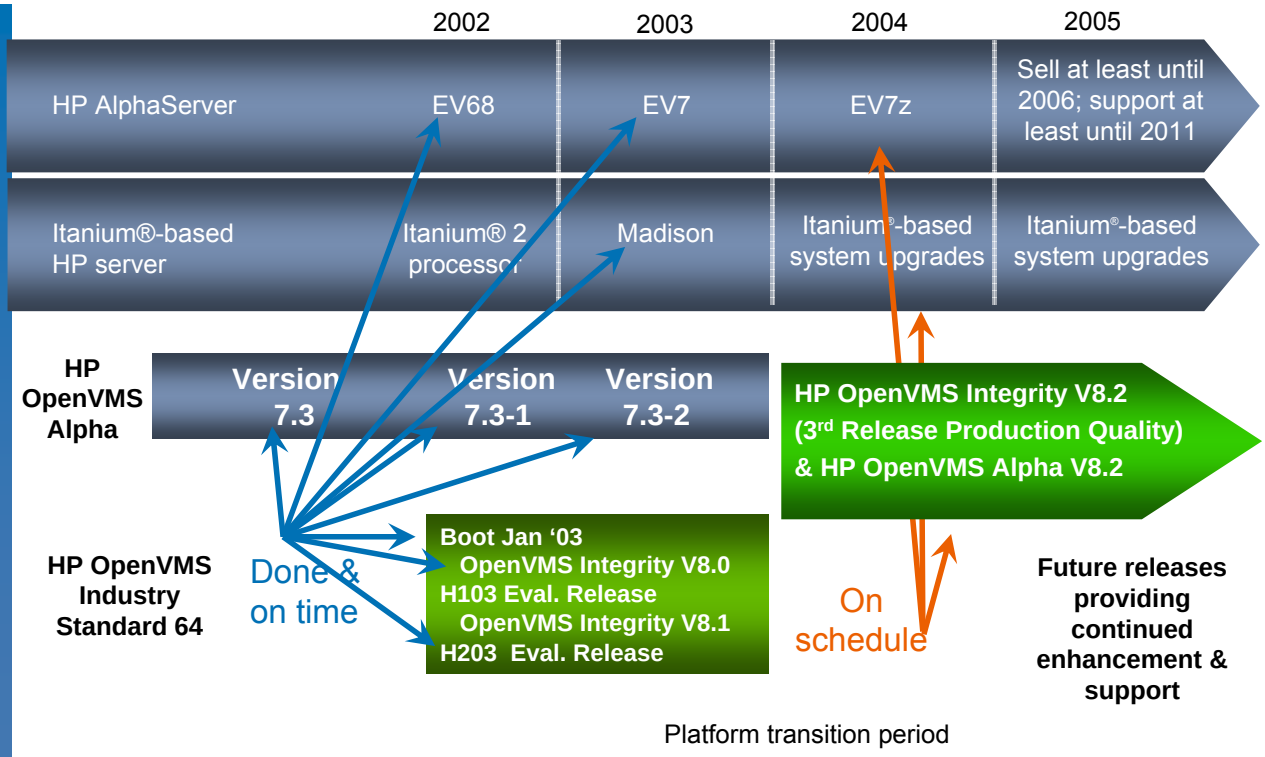
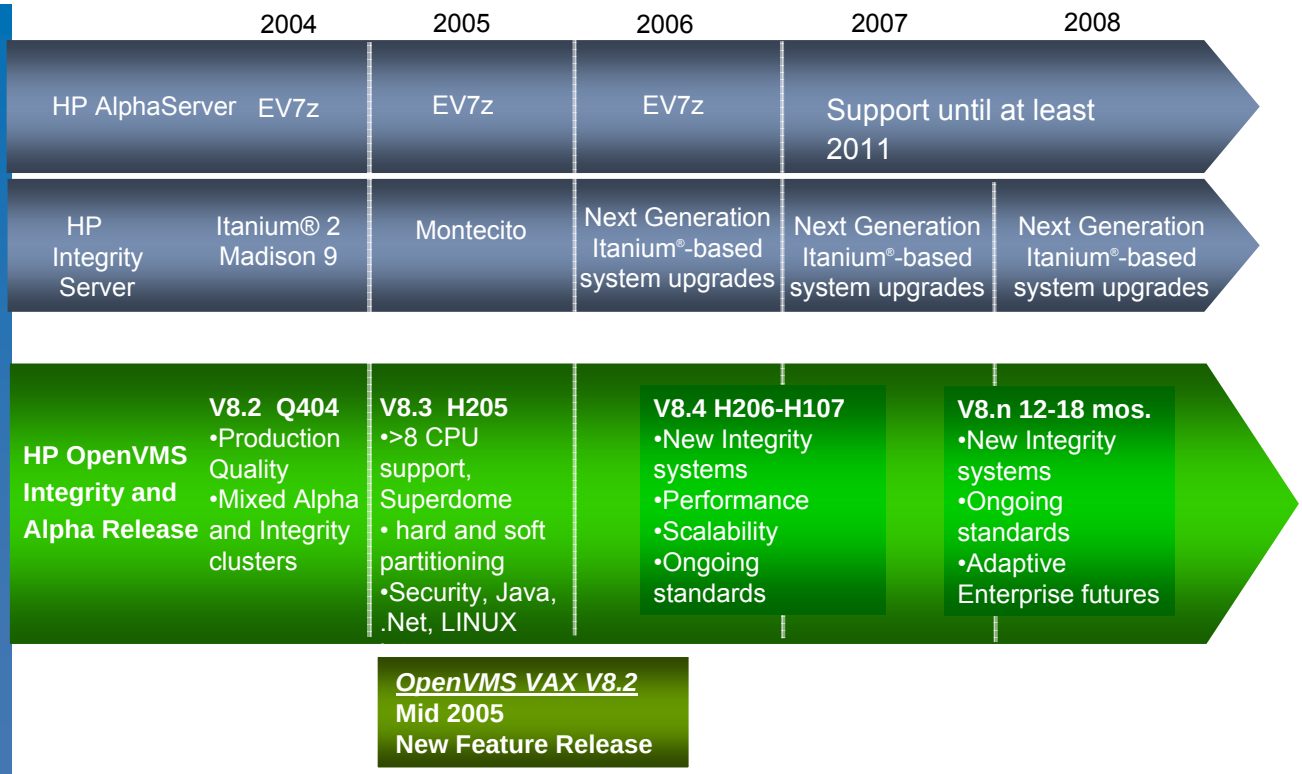
Agenda

- OpenVMS Directions & Roadmaps
- Customer Support Services Update
- OpenVMS Integrity
  - Rollout Plans
  - Porting Status
  - Licensing & Packaging
- OpenVMS V8.2 Features
- OpenVMS V8.3 Potential Projects
- OpenVMS Futures

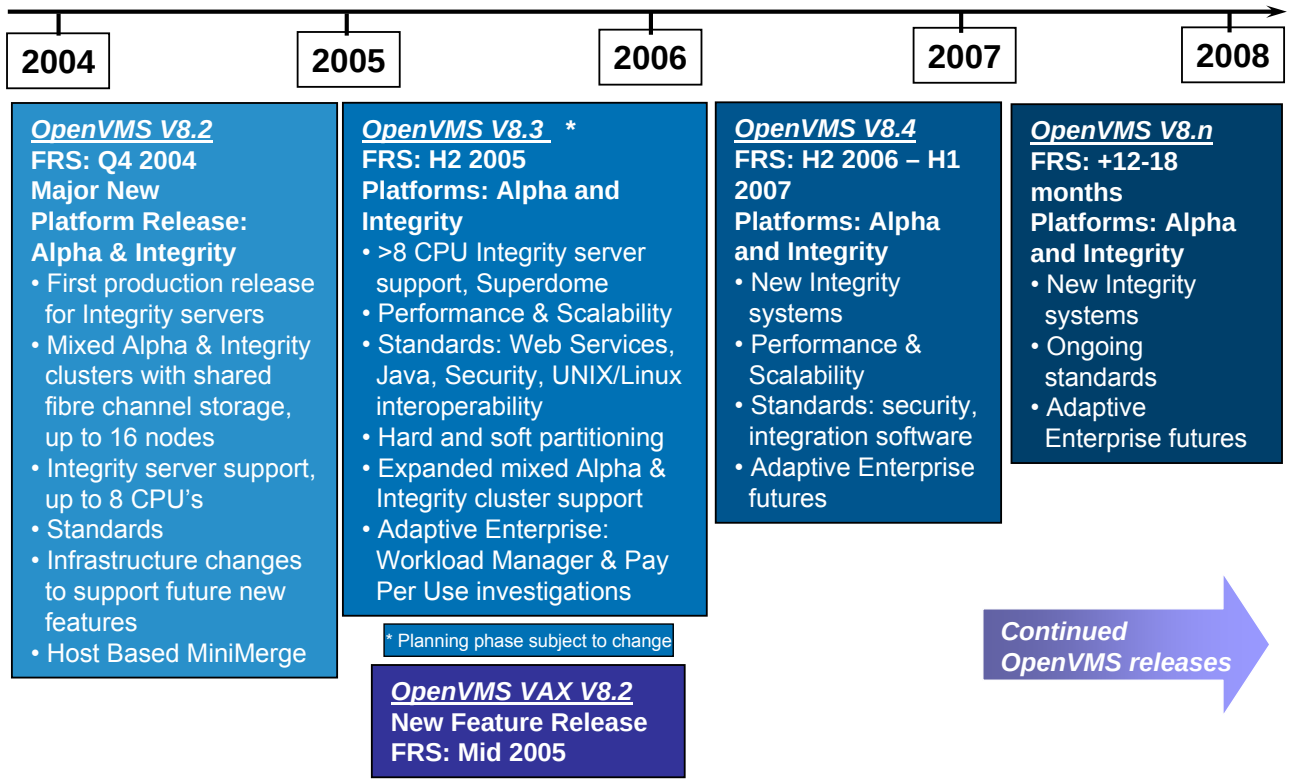
HP OpenVMS Roadmap



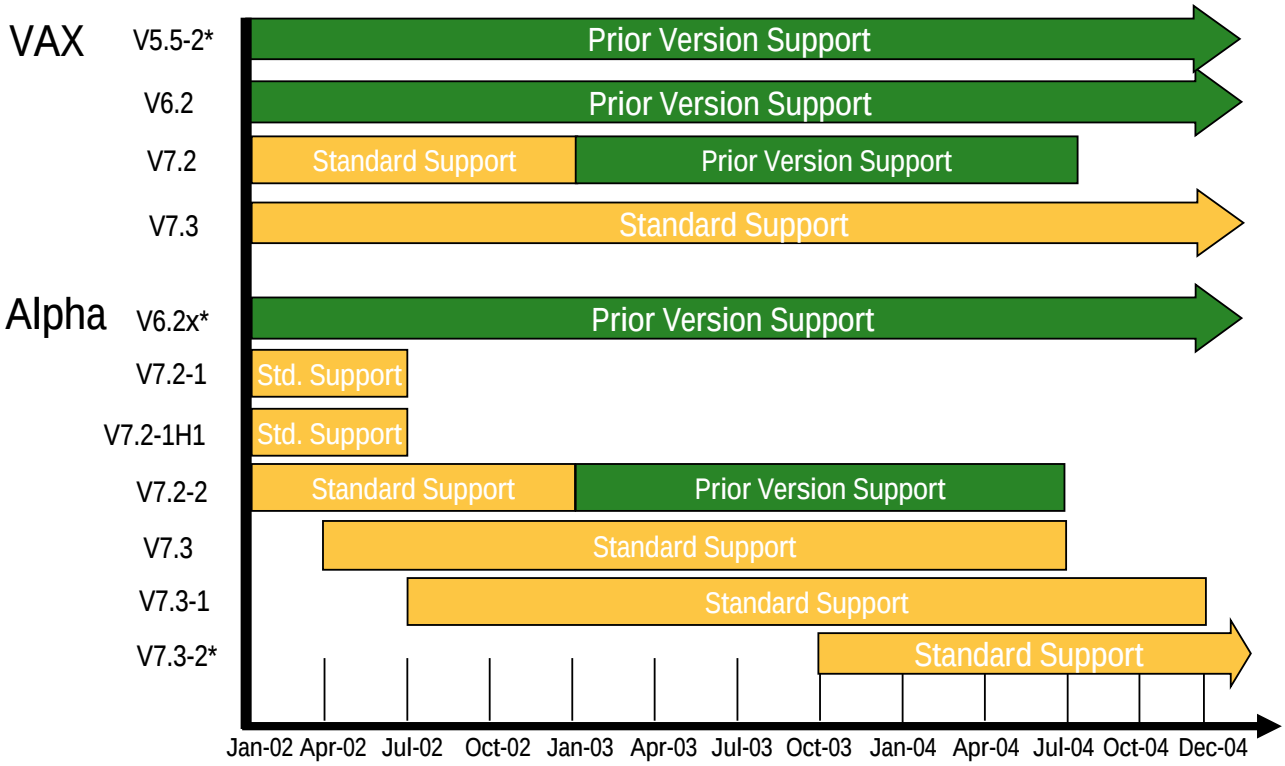
HP OpenVMS Roadmap



HP OpenVMS Operating System 4 Year Rolling Roadmap

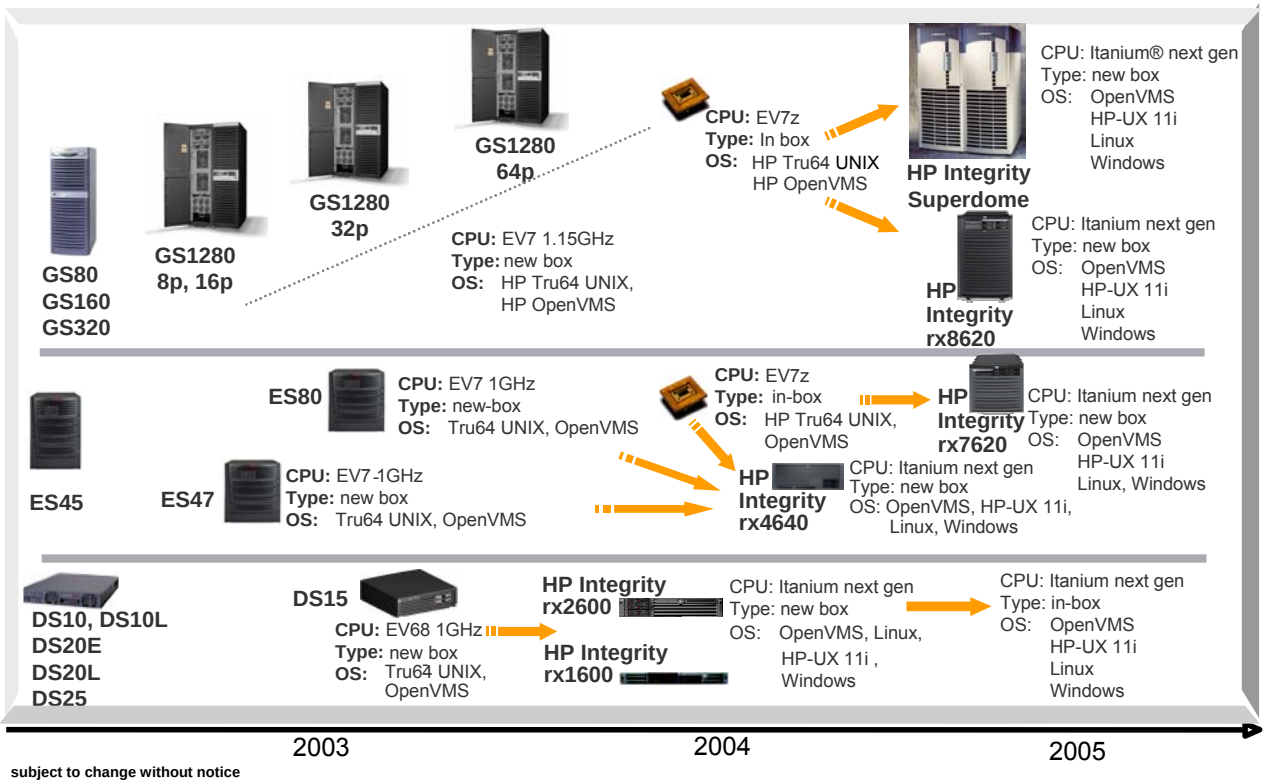


OpenVMS Service Support Roadmap



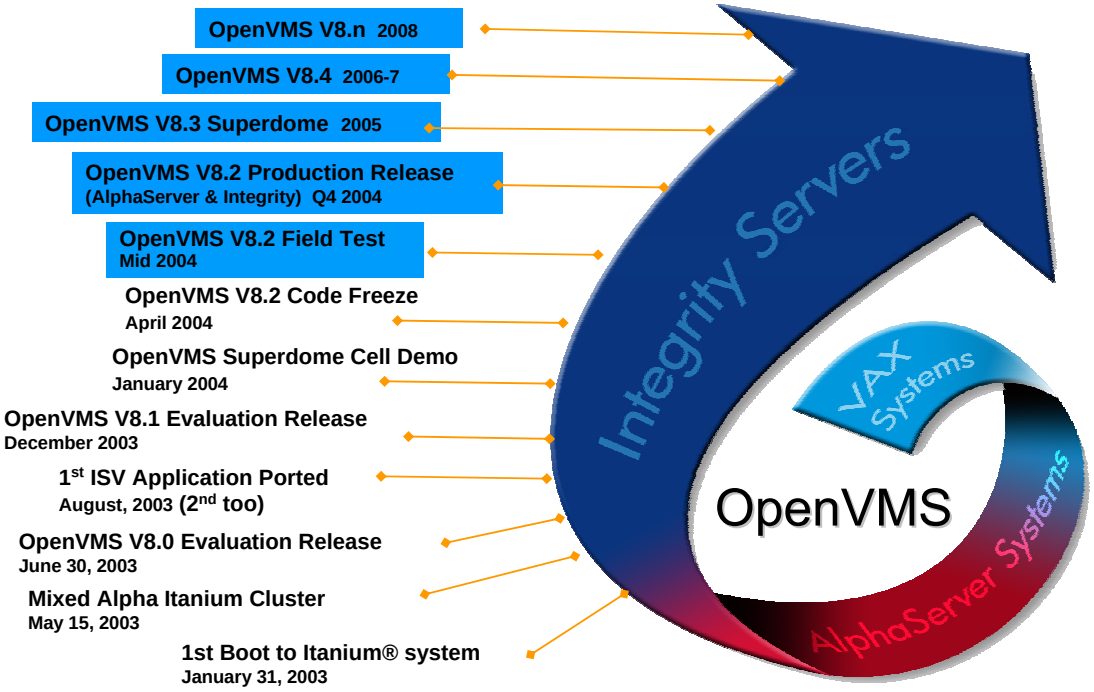
HP AlphaServer evolution

Sales at least until 2006, with support at least until 2011



subject to change without notice

HP OpenVMS – the road to Itanium



OpenVMS for Integrity Servers Rollout Plan

Mid 2004

Version V8.2 (Field Test release)

- rx1600
- rx2600
- rx4640

Note: Last Release to support McKinley

Q4 2004

Version V8.2

- rx1600
- rx2600
- rx4640 up to 8 CPU's

All speed variants supported on these platforms

CPU: Deerfield, Madison 9

Note: No McKinley support

2005

Version V8.3

- rx1600
- rx2600
- rx4640
- rx76xx
- rx86xx
- Superdome

CPU: Montecito *Dual Core, 24MB, 90nm Technology*

Note: OpenVMS will not be supported on the rx5670

OpenVMS Integrity Clusters Rollout Plan

Mid 2004

Version 8.2 Field Test

❖2-4 Node Clusters

❖Cluster Interconnect
- Gigabit Ethernet
- 10/100 Ethernet

Q4 2004

Version 8.2

❖Up to 16 Nodes
- Expanded Functionality

❖Cluster Interconnect
- Gigabit Ethernet
- 10/100 Ethernet

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

2005

Version 8.3

❖Full Functionality
- Cluster Satellite Boot

❖Cluster Interconnect
- Gigabit Ethernet
- 10/100 Ethernet
- Fibre Channel LAN
- 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

OpenVMS Integrity Option Rollout Plan

2004

Version 8.2

❖**Storage**
- U160 & U320 SCSI (non-shared)
- Fibre Channel
- SmartArray Backplane RAID

❖**Storage Solutions**
- HSG, EVA, MSA1000, XP

❖**LAN**
- 5701(10/100/1000)
- 8255x (10/100/1000)

❖**Graphics**
- ATI Radeon 7000 equiv.
- ATI Radeon 7500/3D

❖**Audio (**tbd)

2005

Version 8.3

❖**Storage**
- U160 & U320 SCSI (non-shared)
- Fibre Channel
- SmartArray Backplane RAID

❖**Storage Solutions**
- HSG, EVA, MSA1000, XP

❖**LAN**
- 5701(10/100/1000) ethernet
- 8255x (10/100/1000)

❖**Graphics**
- Yes (tbd)

❖**Audio** (tbd)

OpenVMS V8.2 Integrity Software available in December

- OpenVMS Operating System
- DCL
- SMP
- Monitor
- LMF
- DCPS
- DCE Run-Time
- TCP/IP Services
- DECnet-Plus End System
- Decnet Phase IV
- OpenVMS Clusters
- Volume Shadowing
- RMS Journaling
- DECram
- DECwindows Motif
- Secure Web Server / Browser
- Java
- Netbeans
- XML Technology
- SOAP Toolkit
- Enterprise Directory
- Management Station
- Availability Manager
- Enterprise Capacity Planner

- BASIC
- C
- C++
- COBOL
- Bliss
- Fortran
- Pascal
- DECset: CMS, MMS, LSE, DTM, PCA & SCA
- DCE Appl. Developer's Kit
- DCE Cell Directory Server
- DCE Security Server
- Distributed Queueing Service
- Distributed File System
- Encryption
- FMS
- Raid Software
- WEBES
- Kerberos
- CDSA
- SSL (Secure Socket Layer)
- TDC2 Data Collector
- WEBM/CIM & Web Agents

Current plans, subject to change

OpenVMS Integrity Layered Product Phase Rollout Plan

Q4/2004	Q1/2005	Q2/2005	Q3/2005
• Compilers: •BASIC •C •C++ •COBOL •Fortran •Pascal • DECset: CMS, MMS, LSE, DTM, PCA & SCA • DQS • DCE • WEBES	• Archive Backup System • BASEstar Family • Data Cartridge Server • Datatrieve • Device Access Software • Disk File Optimizer (DFO) • Distributed File System • FMS • Hierarchical Storage Mgmt. • Media Robot Utility • OpenView OVO Agent • RAID Software • Save Set Manager (SSM)	• GKS • OpenView Data Protector • Phigs • Reliable Transaction Router (RTR) Front & Back End • X.25	• ACMS (including TP Web & TP Desktop Connectors) • Advanced Server • DECforms
			Q4/2005
			• Soft Partitioning (ie. Galaxy/vPars) • Storage Library System (SLS)

Proposed dates – see applications status report for full details

Migration Tool

- New software available: hp OpenVMS Migration Software for Alpha to Itanium Servers
  - Provides the capability to translate executable and shareable OpenVMS/Alpha images to functionally equivalent images that run on OpenVMS/Integrity servers
  - Includes language support for C, C++, Fortran and COBOL
  - No additional license required for software installation or use
  - Support will be on best-effort basis by OpenVMS engineering
  - Will be available on the OpenVMS distribution media DVDs, and on OpenVMS external website (location is TBD)
  - Contact pat.stlaurent@hp.com

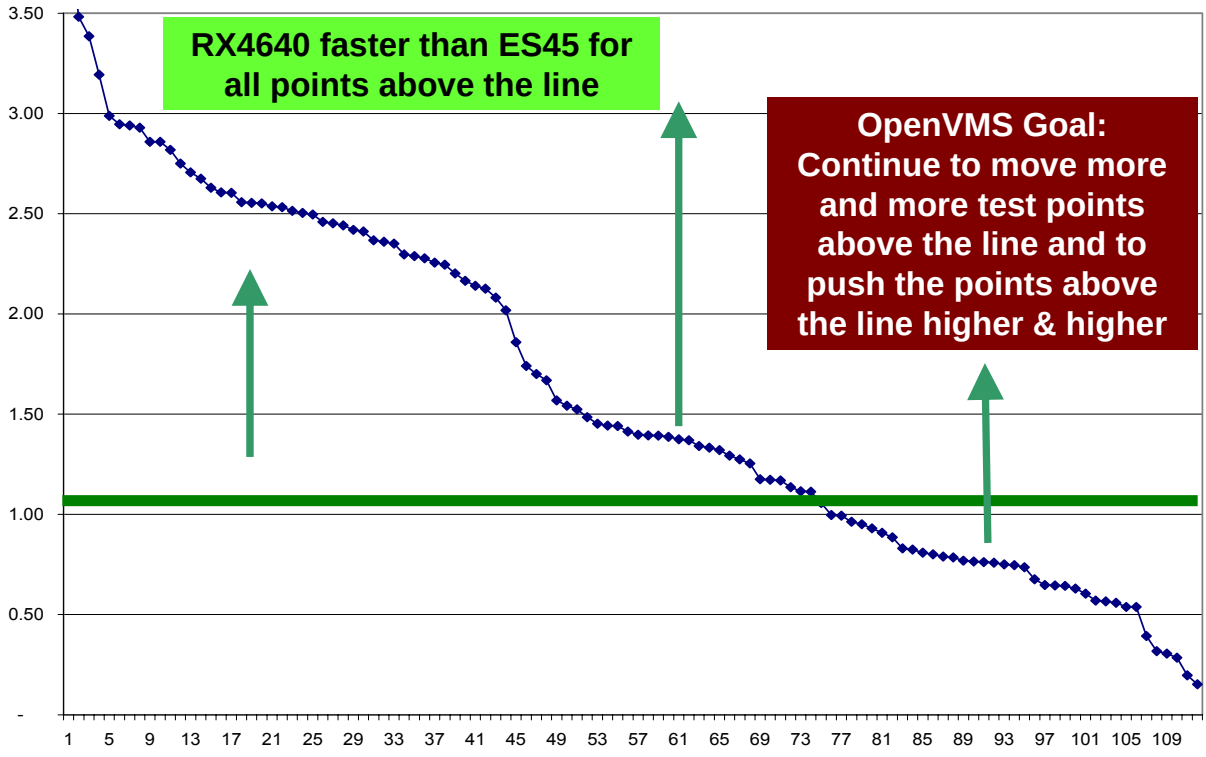
Overall status of OpenVMS HP Integrity Server partner support

- More than 670 applications from 310 partners are planned for port to OpenVMS Integrity Servers; more coming every week
- Over 130 applications ported already
- OpenVMS participating in North American and European Integrity Boot Camps
- Good progress with Rdb and Oracle Server port teams

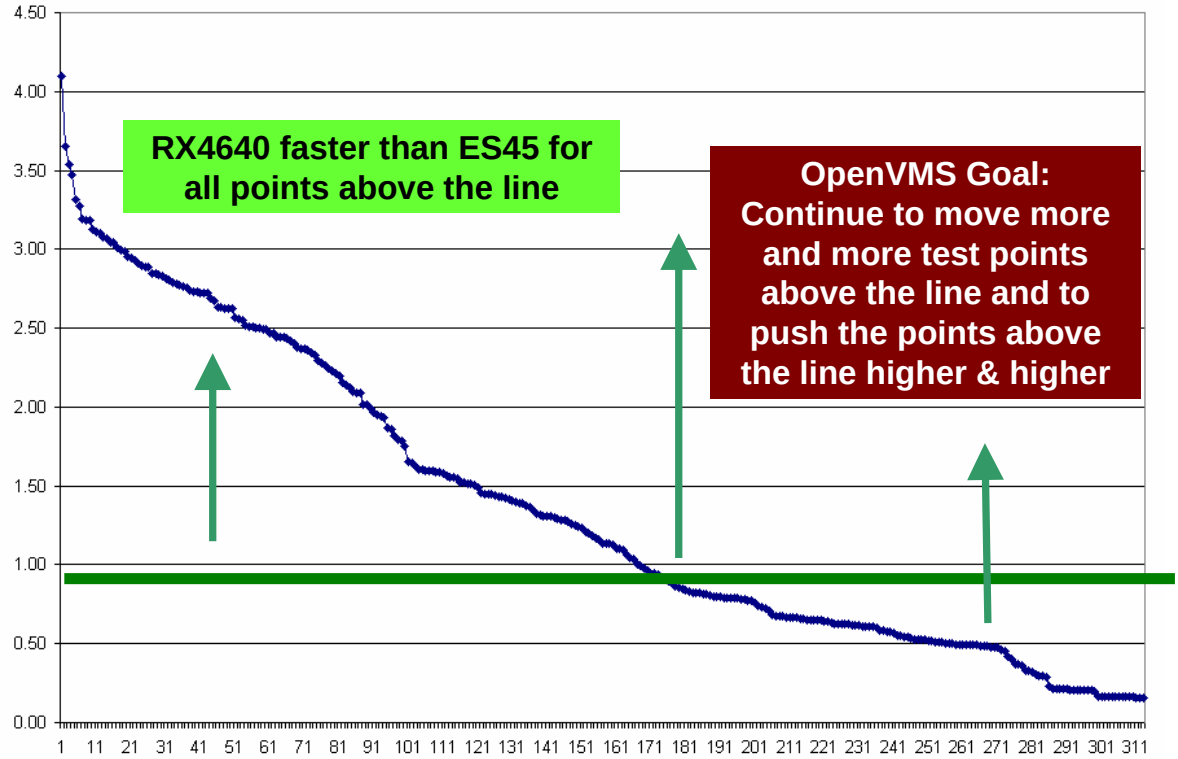
Quotes from recent porters

- "By the way, to get those 3 million lines of code compiled, we had to change 6 lines, where the compiler seemed to be a bit picky about type casts, and a GOTO within a loop."
- "The ease of the port to Itanium 2 under OpenVMS exceeded our wildest expectations. We carried out the exercise using HP facilities during the ISV Developers Forum for Itanium2. The application sources copied from our Alpha built without any changes - even including a small quantity of legacy VAX Macro-32 source! Regression testing has so far not shown up any problems whatsoever with the application and we look forward to rolling out the new platforms to key customers at an early date."
- "There were approximately 75,000 lines of C and MACRO-32 source code to compile and the complete port - including restoring of data and programs to the system, compiling the code and running it - took 30-35 minutes before I ran the main application and had no issues at all."

System Services Comparison – *May* 2004



System Services Comparison – *July* 2004



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

New Operating Environment Options

•HP OpenVMS Mission Critical OE

•HP OpenVMS Enterprise OE

•HP OpenVMS Foundation OE

Easier to order, easier to sell: Follows HP-UX packaging, licensing, and pricing

Easier license management

Straight forward installation of OE's from a single DVD

Simpler support contracts

➔ higher customer satisfaction

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

- BridgeWorks
- COM for OpenVMS
- 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

HP OpenVMS Integrity Packaging

OpenVMS Integrity Enterprise Operating Environment

OpenVMS Integrity Foundation OE

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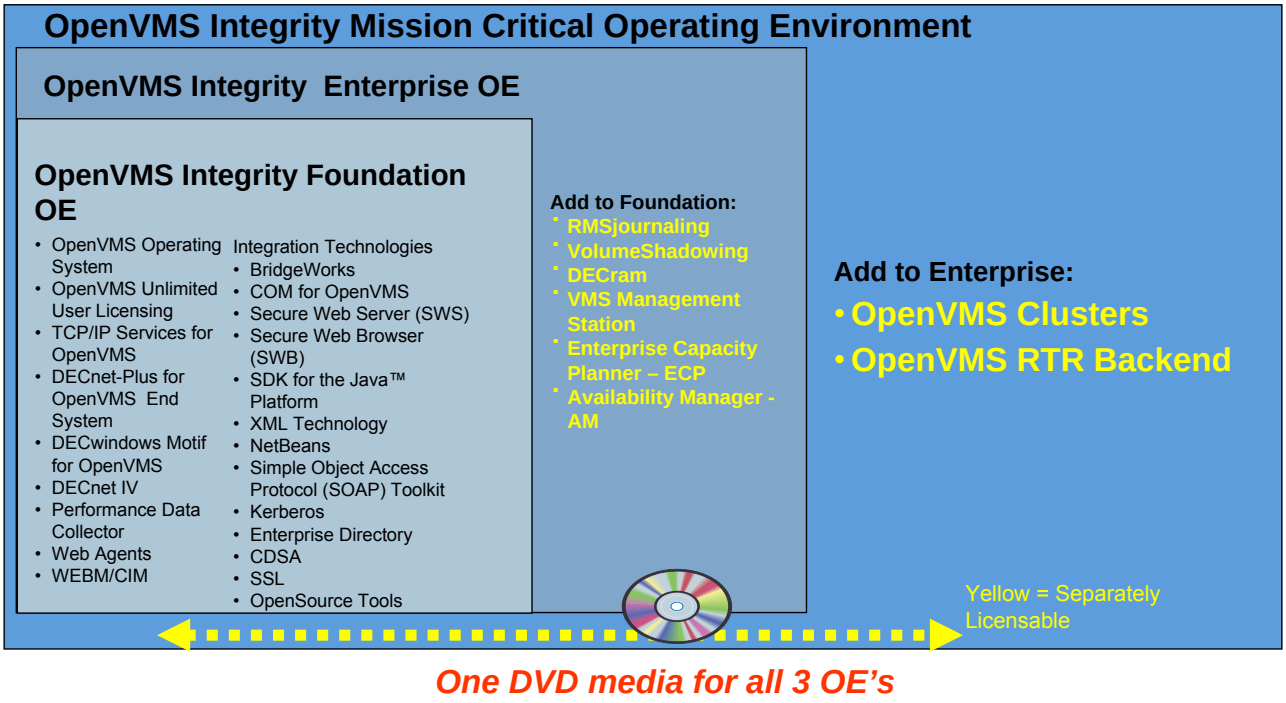
- SSL
- OpenSource Tools

Add to Foundation:

- **RMS journaling**
- **Volume Shadowing**
- **DECram**
- **OpenVMS Management Station**
- **Enterprise Capacity Planner – ECP**
- **Availability Manager-AM**

Yellow = Separately Licensable

HP OpenVMS Integrity Packaging



One DVD media for all 3 OE's

Software Cross Platform Trade-in Policy

Support Customer	• **Licenses on support* are traded-in for new licenses at no charge** • **Commitment to continue support* on new licenses for one (1) year**
Non-Support Customer	• **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)

OpenVMS Alpha & Integrity

….2004 Coming Attractions

OpenVMS V8.2 (Topaz)

- Field test target = Mid 2004
- FRS = Q4 2004
- Version 8.2 Highlights
  - System and Hardware Support
  - General User Features
  - Performance & Scalability Infrastructure Changes
  - RAS features
  - Security Enhancements
  - More UNIX Portability features
  - Networking Enhancements
  - System Management
- VAX V8.2 is planned for mid-2005

General User Features

- DCL Enhancements
  - Thread-based
  - **SHOW SYSTEM /IMAGE**
  - **DIR /SELECT=VERSION[=MIN=x|=MAX=y]**
  - **DELETE /GRAND_TOTAL**
  - **SEARCH/WILDCARD /LIMIT /SKIP**
  - **CREATE /MAILBOX**
  - **WRITE /NOWAIT**
  - **SHOW FASTPATH /CPU /OUT**
  - **F$LICENSE**
  - **F$FID_TO_NAME**
  - CTRL-T AST in **COPY/DELETE/PURGE** displays progress
  - 30% performance increase when executing procedures

General User Features

- MONITOR updated to be a native image
  - originally in PL/1, now rewritten in C
  - various performance enhancements
  - better data collecting algorithms
  - removal of SCHED spinlock usage
  - heavy alignment faulting corrected
  - bugfixes
  - **MONITOR SYSTEM** now has a “CUR” display

General User Features

- **PATCH** ported to Alpha and Itanium
- new lexical function **F$MPDEV** for multipath devices
- **BACKUP/PHYSICAL** doesn't need identical src/dest disks
- **SET/SHOW IMAGE** to view/modify link flags
- Clusterwide Logical Names

Infrastructure changes in V8.2

- We're making changes to some system level data structures in OpenVMS V8.2 (Alpha and I64)
- Benefits
  - Laying the foundation for scalability and performance improvements in future releases of OpenVMS
- Impact to applications
  - Non-privileged applications are not affected
  - 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

RAS Features

- Shadowing Host Based Mini-Merge
  - Support on V7.3-2 with VMS732-UPDATE-V0300 Q404
  - Integrated in OpenVMS Alpha and Integrity V8.2
- LAN failover improvements
  - Adds support for DE500 and Jumbo Frame support for gigabit Ethernet
- Performance
  - Pthreads Shared Objects
  - Extended Value Blocks in the Lock Manager
  - KP Threads – new threading feature

Security Enhancements

- ACME Login EAK
  - with LDAP support
- Kerberos (including VAX)
- OpenSSL (including VAX)
- CDSA
  - Secure Delivery SDK allowing verification of authenticity of downloads and installations of OpenVMS software
- Buffer Overflow Protection (Itanium only)
  - Prevents against unauthorized code execution

Unix Portability (UP)

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

- CRTL APIs
- DCL support
- NFS support
- CRTL – delivering UNIX style API’s on OpenVMS
- File Lock APIs
- statvfs/fstatvfs
- Stnd stat struct
- GNV 1.6 – providing a UNIX style shell and utilities
- VI, gnuTAR and configure/Make improvements
- Symbolic Links - latent

System Management

- The Data Collector (TDC)
  - Version 2.1 will be available in the V8.2 kit and on the web
  - 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 is a managed node by OpenView Operations

TCP/IP Services for OpenVMS

TCP/IP V5.4 released
- SSHv2 client functionality
- failSAFE IP (IP fail over)
- Scalable kernel

TCP/IP V5.5 on Itanium® and Alpha - H2CY04 support of OpenVMS V8.2
- NFS symbolic link support
- Libpcap library and TCPDUMP updates
- IPv6 configuration enhancements
- IPV6 support for PWIP

TCP/IP (Next)
(H2 2005)
Continued focus on performance & security
- Updated SSH, SSL, Kerberos
- IPsec
- BIND 9 resolver
- FTP large file support support >2GB files
- More IPv6 functionality

IPSEC EAK
H2 CY04

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 (Alpha only)

OpenVMS Alpha & Integrity

….2005 Coming Attractions

OpenVMS V8.3 (Nemo)

- Target shipment date = H2 2005
- Candidates:
  - Greater than 8 CPU platforms support, including Superdome
  - Hard and soft partitioning
  - Fibre Channel as a LAN
  - VLAN support
  - Cluster Satellite boot on Integrity systems
  - New security features: Secure Delivery, full external authentication including Kerberos and LDAP support
  - Continued Java, web services updates
  - Backup enhancements
  - Potential for more Adaptive Enterprise features such as Pay Per Use (PPU) and Work Load Manager (WLM)

OpenVMS Futures:
Performance and Scaling

Technologies

- OpenVMS infrastructure changes
- I/O & SMP Scaling
- Increased Logical Block Numbers (LBN)
- Investigating >32 CPU Support
- User code in P2 space
- File system enhancements
- Fibre as a LAN
- New Cluster Interconnect (RNIC & Infiniband)
- New Storage technologies (iSCSI & 4 gb fibre channel)
- New LAN technologies (10 Gigabit & VLAN)
- Link Aggregation

Business Benefits

- Laying the foundation for scalability and performance improvements in future releases of OpenVMS
- Provide investment protection by utilizing current system longer
- Grow your business without added expense and costly system trade-ins or upgrades
- Provide full utility of current system resources
- Provide longer life for applications, allowing expanded scalability and higher performance

OpenVMS Futures:
Standards and Interoperability

Technologies

- Java J2SE including HotSpot
- LINUX/UNIX portability
  - Fork investigation
  - UNIX Signals
- Web Services
  - XML, SOAP, UDDI, WSDL
  - Web Services Toolit
- Security
  - Secure Software Delivery
  - ACME Login w/LDAP ACME
  - Kerberos ACME
  - True Random Number Generator
  - OpenSSL upgrade
  - Kerberos V1.3.2
  - SSH Upgrade
- TCP/IP
  - IPv6 Enhancements
  - IPSEC
  - IP Filter
  - Network Intrusion Detection
  - BIND9 Resolver
  - FTP large file support

Business Benefits

- Increase the ROI of existing applications.
- Increase revenue and reduce costs by developing new revenue-generating solutions from existing applications
- Increase revenue and reduce costs by collaborating with partners and suppliers to streamline business processes
- Reduce costs by focusing resources on a simple application infrastructure

OpenVMS Futures:
Virtualization

Technologies

- Pay-Per Use (PPU)
- Investigating Utility Data Center (UDC)
- Workload Manager (WLM)
- Process Resource Manager (PRM)
- WBEM
- Storage Area Networks (SAN) Storage virtualization
- GRID Investigation – Highly distributed parallel applications

Business Benefits

- Improve ROI by providing business flexibility and agility at lower costs
- Lower costs by pooling resources that makes them easily accessible
- Improve service levels by allocating and relocating services where they're needed
- Link businesses with IT