



HP OpenVMS Technical Update and Roadmaps

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Agenda

- OpenVMS Roadmap Highlights
- Technical Update
- OpenVMS Technical Futures
- HP Support Policies





OpenVMS Roadmap Highlights

OpenVMS V8.2

- 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

“OpenVMS continues to be a strategic platform for HP. This is demonstrated by the new release of OpenVMS Version 8.2...”

***Ann Livermore
Executive Vice President
Technology Solutions Group***

Integrity Listing DVD part numbers:

- ***BA422AA (Product)***
- ***HA156AC (Software updates)***
- ***HA108A* (Care Pack – specify years)***

OpenVMS v8.2 orderable today on these servers



More to
come



HP Integrity
rx4640-8 (8-way)
dense form factor



HP Integrity
rx2620-2
(2-way)



HP Integrity
rx1620-2
(2-way)



GS1280
8-64p
EV7z 1.3GHz (**)
EV7 1.15 GHz



ES80
2-8p
EV7 1.15GHz (**)
& 1 GHz



ES47
2-4p
EV7 1.15GHz (**)
& 1 GHz



ES45
1-4p
EV68 1.25GHz

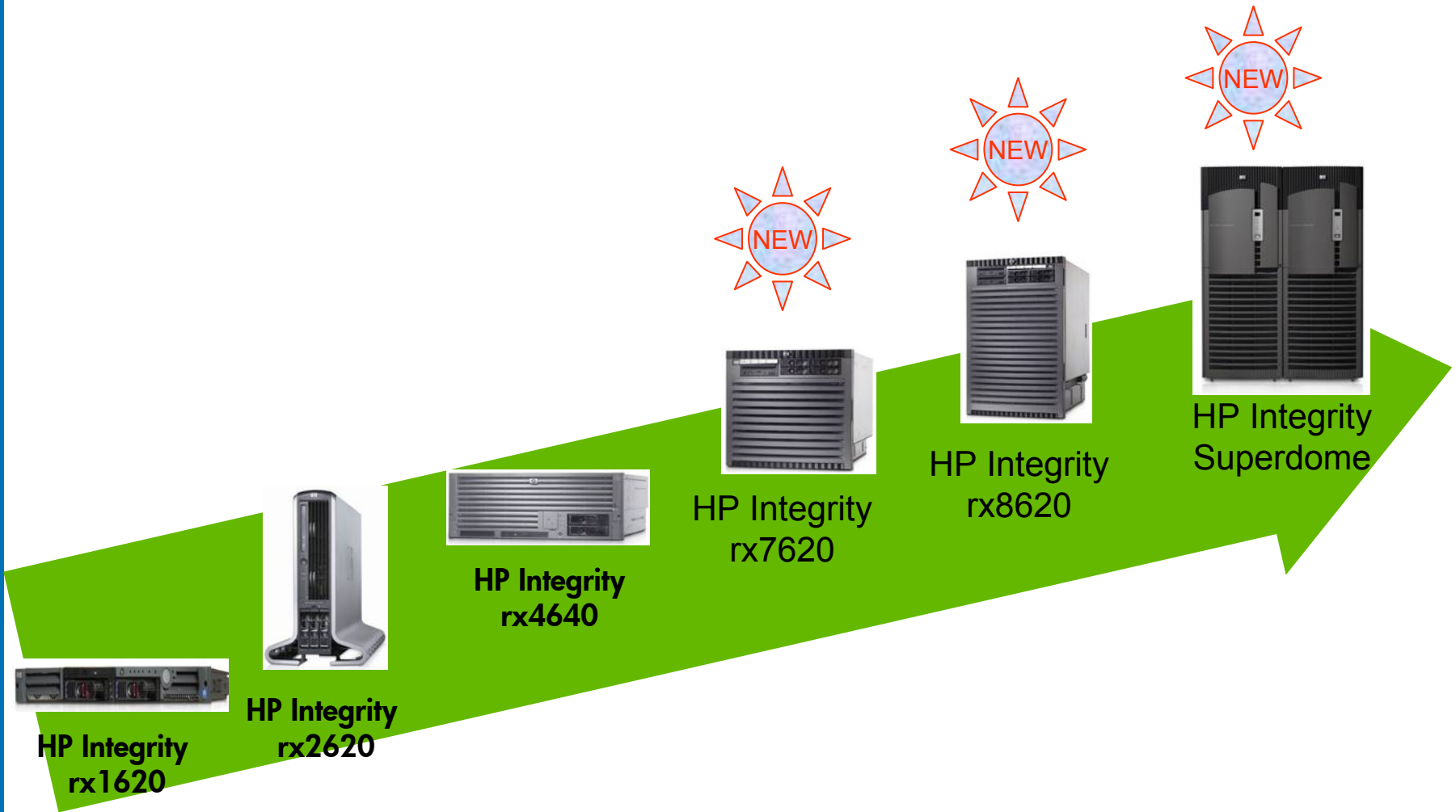


DS25
1-2p
EV68 1 GHz



DS15
1p
EV68 1GHz

OpenVMS v8.2-1 supports the entire line of HP Integrity servers



New

OpenVMS V8.2-1 for Integrity Servers



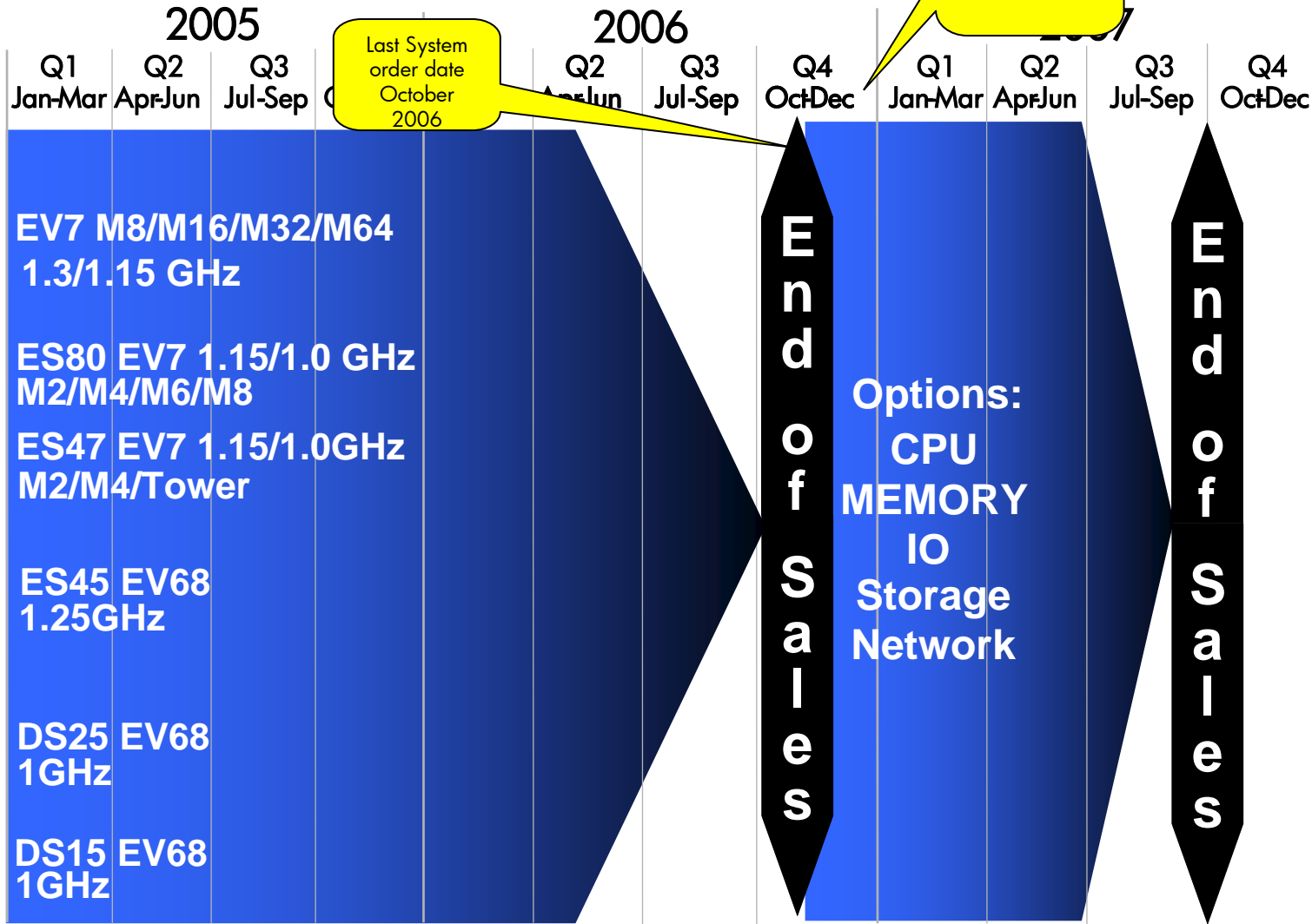
- Integrity only release – Available now!
 - Replaces OpenVMS V8.2 for Integrity servers....support for V8.2 on Integrity will end about June 2006.
 - Introduce OpenVMS support for larger Integrity servers (Madison 9 only):
 - rx8620: 4 cells, up to 16 CPUs
 - rx7620: 2 cells, up to 8 CPUs
 - Superdome: Hard partitions of up to 16p/4 cells
 - Low-cost 2-node Multi-host SCSI cluster
 - 96-node AlphaServer/Integrity clusters
 - Performance and scaling enhancements
 - Improved hardware fault handling
 - Power saver feature to reduce electricity use

HP AlphaServer Roadmap



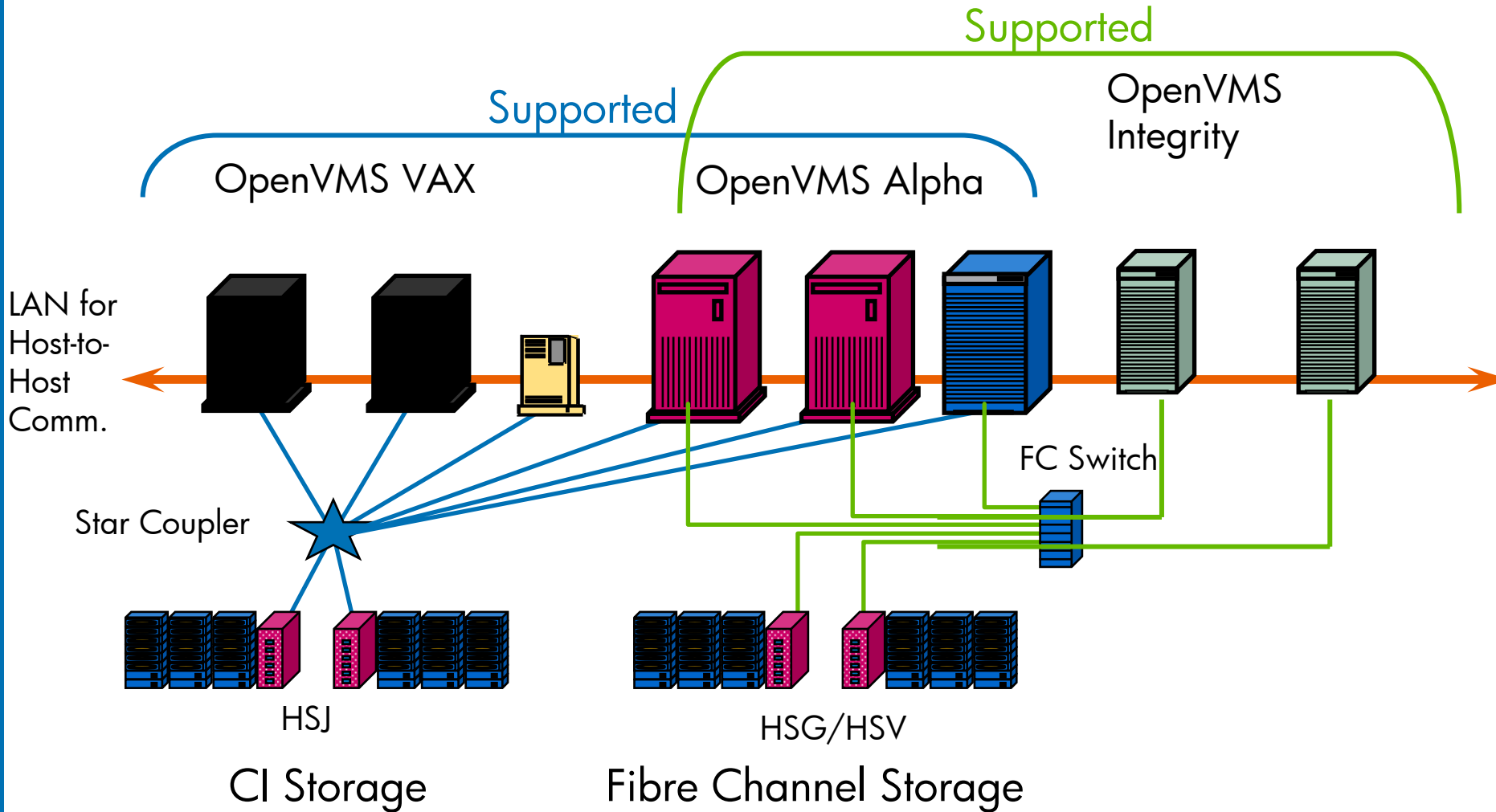
Last System ship date
December 2006

Last System order date
October 2006



Support at least through 2011

OpenVMS Clusters Facilitate Integrity Adoption



NOTE: Support for VAX and Integrity mixed environment is supported for migration purposes only.

HP OpenVMS Operating System Rolling Roadmap



2005

OpenVMS V8.2

FRS: February 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

V8.2-1, Sept. 2005 Integrity Only

- Superdome, rx8620, 7620 support
- 96 node support

2006

OpenVMS V8.3 *

FRS: 2006

Platforms: Alpha and Integrity

- Montecito support for Superdome, rx8620 and rx7620
- Performance & Scalability
- Standards: Web Services, Java, Security, UNIX/Linux interoperability
- Virtualization: PPU, gWLM

V8.2-1 based, Q1 2006

- rx1600, rx2600 & rx4640 Montecito upgrades

2007

OpenVMS V8.4

FRS: +12-18 months

Platforms: Alpha and Integrity

- New Integrity systems
- Performance & Scalability
- Standards: security, integration software
- Adaptive Enterprise futures

2008

OpenVMS V8.n

FRS: +12-18 months

Platforms: Alpha and Integrity

- New Integrity systems
- Ongoing standards
- Adaptive Enterprise futures

2009

Continued OpenVMS releases

* Planning phase subject to change

Operating environments for OpenVMS on HP Integrity servers



OpenVMS I64 Mission Critical Operating Environment (MCOE)

OpenVMS I64 Enterprise Operating Environment (EOE)

OpenVMS I64 Foundation Operating Environment (FOE)

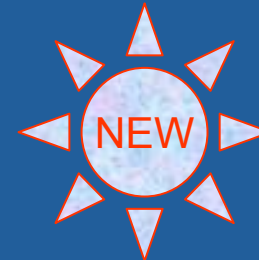
- OpenVMS Operating System
- OpenVMS Unlimited User Licensing
- CDSA
- DCE RPC Runtime
- DECnet-Plus for OpenVMS End System
- DECnet IV
- DECprint Supervisor (DCPS)
- DECwindows Motif for OpenVMS
- Distributed NetBeans, including plugins for C/C++, Fortran, EDT keypad, and CMS
- Enterprise Directory
- Java™ Platform, Standard Edition, Development Kit (JDK)
- Kerberos
- NetBeans IDE, including plugins for C/C++, Fortran, EDT keypad, and CMS
- Performance Data Collector
- Secure Web Server (SWS) (based on Apache server), including Tomcat, mod_PHP, mod_Perl, and Perl
- Secure Web Browser (SWB) (based on Mozilla)
- Simple Object Access Protocol (SOAP) Toolkit (based on Apache Axis)
- Secure Socket Layer (SSL) (based on OpenSSL)
- TCP/IP Services for OpenVMS
- Universal Description, Discovery, and Integration (UDDI) Client Toolkit (based on UDDI4J)
- (Web) Management Agents (for operation with HP Systems Insight Manager)
- Web Based Enterprise Management (WBEM)
- XML Technology (based on Apache Xerces and Xalan)

Add to Foundation:

- RMS Journaling
- VolumeShadowing
- DECram
- OpenVMS Management Station
- Availability Manager

Add to Enterprise:

- OpenVMS Clusters
- OpenVMS RTR Backend



One DVD media for all 3 OE's

Easier to order

Easier license management

Straight forward installation of OE's from a single DVD

Simpler support contracts

➔ higher customer satisfaction

Subject to change

License Trade In Rules to Integrity

- 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

OpenVMS Integrity Layered Product Phase Rollout Plan



Available Today	Q4/2005	H1 2006
<ul style="list-style-type: none"> • Compilers: <ul style="list-style-type: none"> • BASIC • C • C++ • COBOL • Fortran • Pascal • DECset tools • DCE • DQS • FMS • OpenView OVO Agent • RAID Software • Archive Backup System • Data Cartridge Server • Disk File Optimizer • Hierarchical Storage Manager • Media Robot Utility • Reliable Transaction Router • Save Set Manager • X.25 • HP OpenVMS Migration Software 	<ul style="list-style-type: none"> • Datatrieve • DEC/EDI • Global Workload Manager (gWLM) • BaseStar Family <ul style="list-style-type: none"> • BASEstar • Open Server • Omni API • Omni MMS • DECoasp/H1 • DECosap/ AP • Siemens S7 	<ul style="list-style-type: none"> • ACMS (including TP Web & TP Desktop Connectors) • DECforms • GKS • IBM Interconnect Family • Samba evaluation kit • TDMS <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">Not Porting</p> <ul style="list-style-type: none"> • Advanced Server • Storage Library System (SLS) </div>

Binary Translator

- HP OpenVMS Migration Software for Alpha to Integrity Server (OMSAI)
 - AKA Binary Translator
- Translates almost all user mode images
- Supports applications written in C, C++, FORTRAN and COBOL
- Can mix native and translated images

Advanced Server, PATHWORKS for OpenVMS & PATHWORKS 32



2005 2006 2007 2008 2009

Advanced Server V7.3a ECO4 for OpenVMS V8.2 & V8.2-1 Alpha – Available Now!

Samba V3.0 evaluation release for Integrity only Dec CY2005

Samba V4.0 Production release Alpha & Integrity H2 CY2006

PATHWORKS for OpenVMS V6.1
• Support for OpenVMS V7.3-2 release
• No IPF Integrity support planned

PATHWORKS 32 – V7.4 Continued support for MS Pack releases for Win 2000, Windows XP & Win Server 2003

How is OpenVMS performance on Integrity servers?

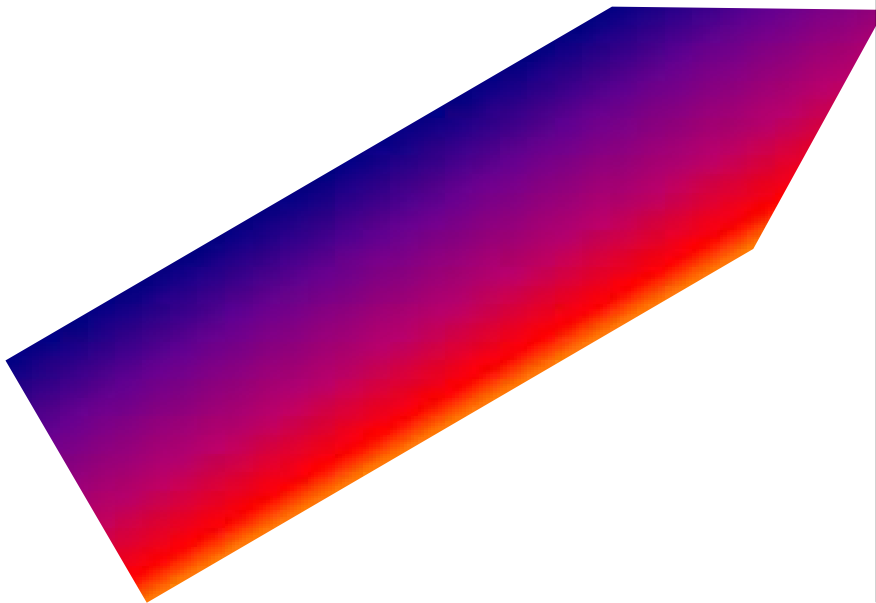


- Today

- 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





OpenVMS Technical Update

Infrastructure changes V8.2



- Some system level data structures have been changed in OpenVMS V8.2
- 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 V8.2

- Internal data structure fields have expanded or moved
 - e.g., PTE, VBN, LBN, unit number...
- Privileged applications and drivers ~~may~~ will need to be recompiled and relinked
- 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 Integrity that switches or manipulates stacks



General User Features V8.2

- 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



RAS Features V8.2

- Host-based MiniMerge (HBMM)
 - Full merge requires comparing entire shadow set but only blocks with I/O in progress need to be merged
- System Service Logging
 - Mechanism to record information about system service activity
- LAN failover improvements



Security Enhancements V8.2

- ACME Login EAK (Early Adopters Kit)
 - 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) V8.2

- OpenVMS will be like any other “UNIX flavor” for easy application portability
- 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
- pThreads Shared Objects
- Symbolic links (available now on VMS field test web site)
 - NFS support



TCPIP V5.5 for OpenVMS V8.2

- Supported on both OpenVMS Alpha and OpenVMS Integrity 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
- Support for NTP V4.2
- Support for TCPDUMP Version 3.7.2
- Update to SSH to V3.5.2
- NFS Symbolic links support
 - Available as SDK on the OpenVMS field test web site



System Management V8.2

- Performance Data Collector V2.1
 - 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

Integrity
only



OpenVMS V8.2-1 (Integrity Only)

- Low-cost 2-node SCSI cluster
- 96-node AlphaServer/Integrity clusters
- Performance and scaling enhancements
- Improved hardware fault handling
- Power saver feature to reduce electricity use
- Host-based Infoserver
- Integrated translated image support
- Fibrechannel performance display in SDA
- Debug enhancements:
 - DELTA
 - System code debugger
 - System dump debugger

OpenVMS support for cell-based Integrity Servers in 2005



- Support on OpenVMS V8.2-1:
- All processor Mad9 speeds for cell-based systems:
 - rx7620-8: 1.5GHz/4M cache; 1.6GHz/6M cache
 - rx8620-16: 1.5GHz/4M cache; 1.6GHz/6M cache
 - Superdome: 1.6GHz/9M cache
- nPar support with parmgr on Windows or HP-UX for partition management of OpenVMS
- Online Diagnostics with WEBES/SEA
- Supported Hardware Configuration:
 - Core I/O support:
 - rx8620 - A7109A - a single card with SCSI U160, Broadcom 5701 network, and console ports.
 - rx7620 - Procurium combo card - U160 SCSI and Broadcom 5701.
 - Orca - A6865A - card with Tulip network and console ports.
 - Maximum of 4 cells per nPar
 - Max memory 32GB per Cell, 128GB per nPar.

OpenVMS support for cell-based Integrity Servers in 2005



- Support on OpenVMS V8.2-1 (continued):
 - Supported add-on I/O adapters:
 - Broadcom 5701 Gbit copper and fiber NICs (A6847A, A6825A)
 - Intel Gbit copper and fiber NICs (A7011A, A7012A)
 - Qlogic 2-port Fibre Channel adapter (A6826A) (including boot support)
 - U320 2port SCSI adapter (A7173A) (including boot support)
 - Fibre Channel/Broadcom 5703 copper and fiber combo cards (A9784A, A9782A) (including boot support of FC)
 - 4-port Intel GigE Tx (copper) (AB545A)
 - Castor combo card (2-channel U320 SCSI and 2-port Intel GigE; AB290A)
- Multiple operating system types in an nPar Configuration
- Latest shipping system firmware will be minimum required revision for all systems
- Optional factory install of OpenVMS



OpenVMS V8.3 (Nemo)

- Target shipment date = H1 2006
- Candidate features...
- New Integrity platform support
 - CPU multithreading support
 - Support for 64 CPUs
- New cluster and LAN features
 - Cluster Satellite boot on Integrity systems
 - PEdriver data compression
 - PEdriver scalability improvements
 - Virtual LAN support
 - 10Gb Ethernet
 - LAN failover improvements



OpenVMS V8.3 Device Support

- Host-based volume shadowing: automatic & restartable minicopy
- 4Gb fibrechannel (latent in V8.2)
- iSCSI infrastructure
- USB 2.0
- USB terminal MUX
- USB mass storage
- SAS / SATA storage (Serial Attached SCSI / Serial ATA)
- CD/DVD record



V8.3 Kernel and Scalability

- 100K mailbox units
- Shared address data for Integrity systems
- Code granularity hint regions in S2 space
- RMS global buffers in P2 space
- System service intercept
- Ongoing performance improvements



V8.3 Unix Portability

- Byte range locking
- Symbolic links APIs
- UNIX pathname handling integrated in RMS
- GNV update



V8.3 Application Development

- DEBUG enhancements
 - NetBeans support
 - Client-server interface
- Trace, watchpoint, and SDA enhancements
- Updated Amacro/Imacro compilers
- Continued Java, web services updates



V8.3 Security & Networking

- Integrated ACME login
 - LDAP ACME
 - Kerberos ACME
- Kerberos update (MIT V1.4)
- SSH & SSL updates
- Integrated encryption services
 - AES encryption support
- NFS server on Integrity systems
- NFS client large file support
- DNS/Bind updates



V8.3 Management & Virtualization

- WBEM infrastructure, nPAR partition provider
- iCAP, TiCAP and PPU
- TDC (The Data Collector) V3.0
- Secure software delivery
- PCSI enhancements
 - ODS-5 naming support
 - Product database validation and repair
 - Product alias names



OpenVMS Future Directions

HP VSE for HP OpenVMS Roadmap

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

Control

- ✓ Systems Insight Manager

Availability

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

Partitioning

- ✓ nPars (Hard Partitioning)
- ✓ vPars (Soft Partitioning)
- ✓ Partition Management SW
- ✓ Class Scheduler

Utility Pricing

- ✓ AlphaServer Instant Capacity

- ✓ global WLM

Shipping 12/05

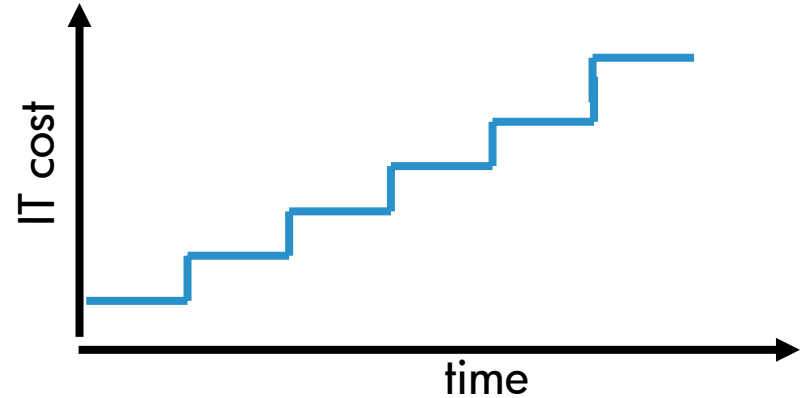
- ✓ HP Integrity Virtual Machines (VM) and Firm Partitioning

- ✓ PPU – all CPUs active and Percent CPU
- ✓ iCAP and TiCAP for Integrity

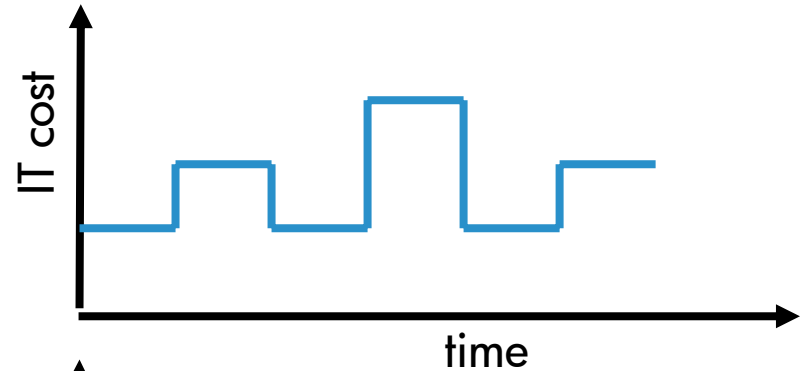
Different solutions for different capacity needs



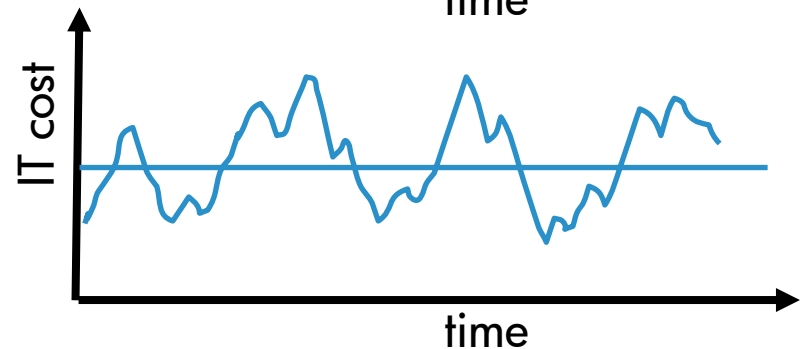
iCAP



Temporary iCAP



Pay Per Use



iCAP for Integrity Servers: How does it work?



- Customer pays a one-time right to access fee per iCAP (inactive) processor
- No activation commitment
- Once extra processing capacity is required, the customer will purchase the enablement for the processor at the discounted list price for that processor
- No email connectivity is required for HP Integrity iCAP processors
- For iCAP on Integrity, 'codeword' is the only way and is available today

Value:

- No premium pricing
- Instant processing power with a single command
- Capability to load balance partitions at no additional cost- dynamically move iCAP processors within a server
- iCAP processor automatically replaces failed CPU
- More flexibility over competition

OpenVMS = Secure by Design



Embracing industry standard security technologies for secure and seamless enterprise on a C2 compliant, Virus resistant highly available platform.



Network security

Support of Industry Standard Network Security tools

- Kerberos
- OpenSSL
- SSH
- IPSEC
- Secure Delivery



Data Integrity and confidentiality

Support Industry Standard encryption

- CDSA
- GnuPG
- Fully integrated AES encryption for OpenVMS (Securing Backups)



Intrusion detection and analysis

- Host Based Cluster wide intrusion detection
- Comprehensive Audit analysis and reporting
- SNORT



Host Access

- Single Security Domain across host or cluster
- methods
- Fine grain privileges
- OpenView integration
- Support for multiple authentication (LDAP, Kerberos)

OpenVMS security

Many layers – single domain

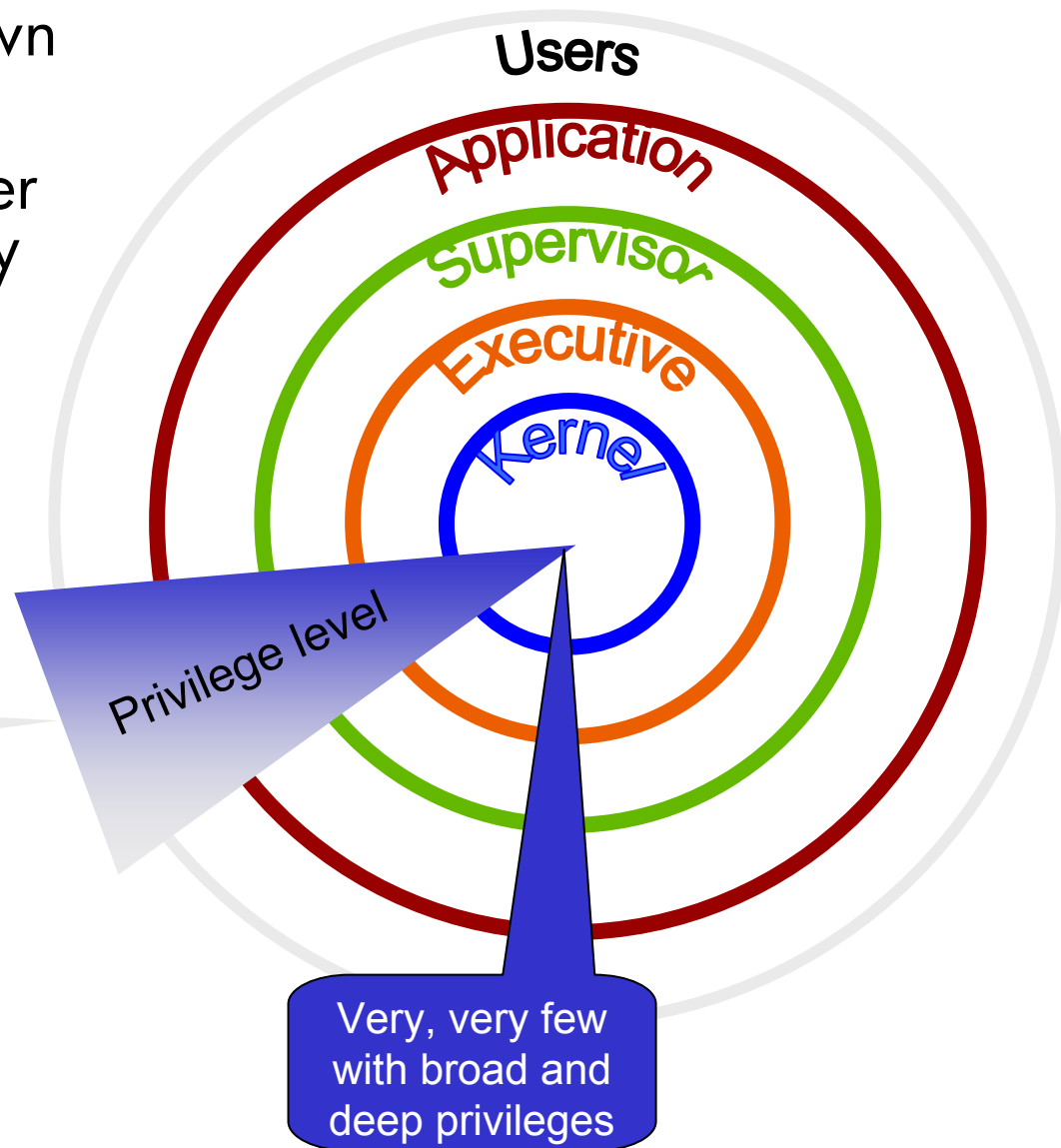


- Each layer requires its own privileges
- A breach in any one layer does not compromise any other layer
- Result:
 - Maximum protection
 - Minimum worry

Many with very limited privileges

Privilege level

Very, very few with broad and deep privileges



eBusiness and Integration Technology Portfolio



- Web servers and browsers
 - Secure Web Server (Apache)
 - Secure Web Browser (Mozilla)

- Web Services
 - Simple Object Access Protocol (SOAP) Toolkit (Apache Axis)
 - XML Technology (parsers and stylesheet processors) (Apache)

New – UDDI Client Toolkit (UDDI4J)

- Development tools
 - Java™ Standard Edition Development Kit (JDK)
 - C/C++, COBOL, Fortran, Basic, Pascal
 - NetBeans and 3GL plugins

New – Distributed NetBeans

- Application servers
 - BEA WebLogic Server
 - Tomcat

- Legacy integration
 - BridgeWorks
 - Web Services Integration Toolkit (WSIT)
 - TP Connector suite
 - Attunity Connect
 - WRQ VeraStream
 - Ericom Host Publisher suite

- Middleware
 - BEA MessageQ
 - orb2 by 2AB
 - IBM WebSphere MQ
 - BEA WebLogic Integration
 - SpiritSoft
 - COM
 - Reliable Transaction Router (RTR)
- Directory services
 - Enterprise Directory (LDAP, JNDI)

Systems Management for OpenVMS



Delivering Manageable Platforms

Enterprise Management



- Heterogeneous coverage
- Increases IT service availability & performance
- Attaches business context to IT service

HP Server Management

Discovery, inventory, fault and remote management, role-based security, distributed tasks



Central Point of Administration

HP Systems Insight Manager

Performance Management

- Performance Data Collector (TDC)
- ECP Analyzer
- OpenView Performance Agent

Configuration Management

- OpenVMS Clusters
- Partition Manager (Galaxy and vPars)
- Management Station

Workload Management

- Class Scheduler
- Global Workload Manager
- Availability Manager

Management Futures

- OpenView Futures
 - OpenView Operations V8 support (https agents)
 - Oracle and Oracle Rdb SPIs
 - OpenView Performance Agent
 - Enables performance management and capacity planning solution for OpenVMS
- Web Management Agents
 - Updates for new supported hardware platforms
 - Server management support via HP Systems Insight Manager (SIM)
- Web Based Enterprise Management (WBEM)
 - Support virtualization and utility pricing initiatives
 - Support migration of HP SIM to WBEM infrastructure
- Continue to update tools bundled with OpenVMS
 - Management Station, Availability Manager, Performance Data Collector (TDC), ECP Performance Analyzer, and WBEM Services



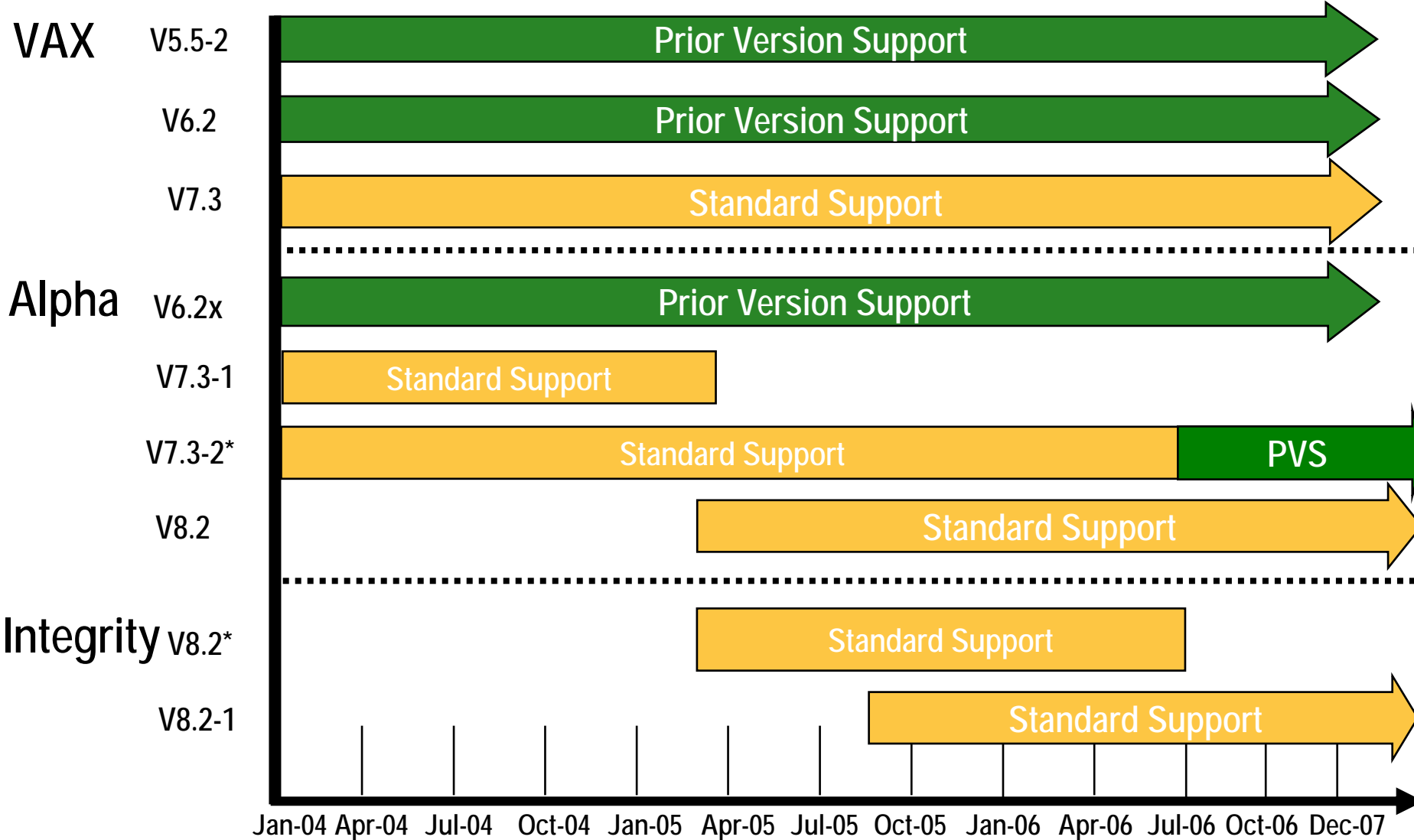
HP Support Policies

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



* Standard support for V7.3-2 on Alpha and V8.2 on Integrity will end when V8.3 ships, which is currently H106.

Summary

- OpenVMS is now available on HP Integrity servers
- OpenVMS continues to be enhanced for both Integrity servers and AlphaServer systems
- The OpenVMS business is very healthy
 - Customers new to OpenVMS account for 10-15% of the business annually

For More Information
<http://h71000.www7.hp.com/>



HP OpenVMS Systems

[Software](#) > [OpenVMS Systems](#)

» HP OpenVMS Systems

OpenVMS information
» What's new on our site
» Send us your comments

Evolving business value
» Alpha RetainTrust program

News and promotions
» News
» Promotions

HP OpenVMS systems
» OpenVMS software
» OpenVMS solutions
» OpenVMS support
» OpenVMS services
» [OpenVMS brochure](#)
» OpenVMS success stories
» OpenVMS on Integrity
» OpenVMS documentation

OpenVMS v8.2 is here!
» OpenVMS v8.2 for Integrity servers and AlphaServer systems is now generally available

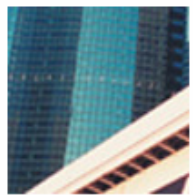


» OpenVMS roadmaps (11/04)
» Alpha RetainTrust program

News and features

- » IBM extends WebSphere MQ V5.3 to OpenVMS
- » HP World Magazine features Mark Gorham, Vice President of OpenVMS Systems
- » OpenVMS FastTrack - speeds solution availability on OpenVMS for Integrity servers
- » General Banking and Trust Company upgrades to disaster-tolerant OpenVMS clusters
- » HP OpenVMS on Integrity servers Open Source Porting Program underway at Turin university
- » OpenVMS support for new AlphaServer systems
- » Features archive

» OpenVMS software



• High availability

» OpenVMS on Integrity



• Full member of multi-OS

» Adaptive Enterprise



• Simplify



i n v e n t