

OpenVMS Update

Gaitan D'Antoni

HP OpenVMS Technical Director

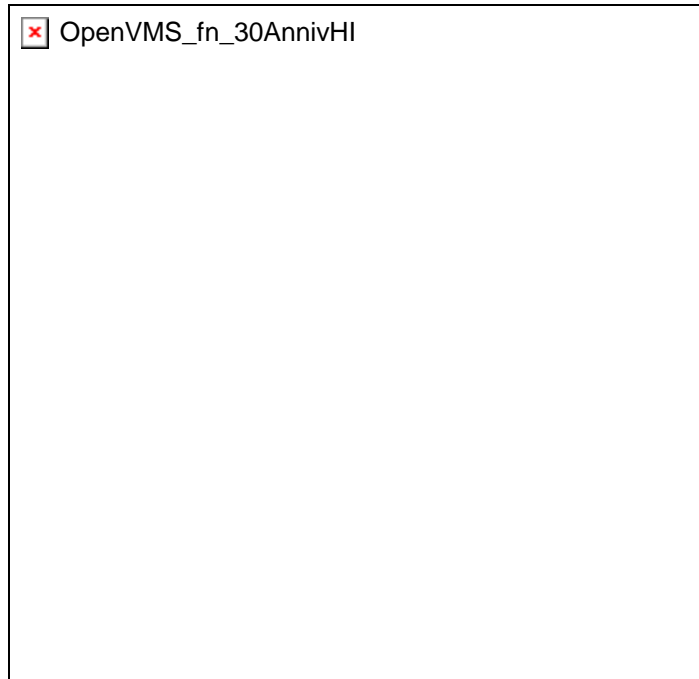
Gaitan.dantoni@hp.com



© 2009 Hewlett-Packard Development Company, L.P.
The information contained herein is subject to change without notice



OpenVMS: moving strongly into its 4th decade with full HP commitment



- OpenVMS profile
- Investment Strategy
- Roadmap
- V8.4 New Features
- Customer Focus

The OpenVMS Mission Statement

The OpenVMS Division is committed to delivering the OpenVMS roadmaps with outstanding quality. The capabilities that customers have come to rely on in OpenVMS - leadership clustering, high availability, excellent quality, exceptional security and “bullet-proof” operations - will continue to be delivered and enhanced by HP, ensuring product leadership now and in the future.

OpenVMS Profile



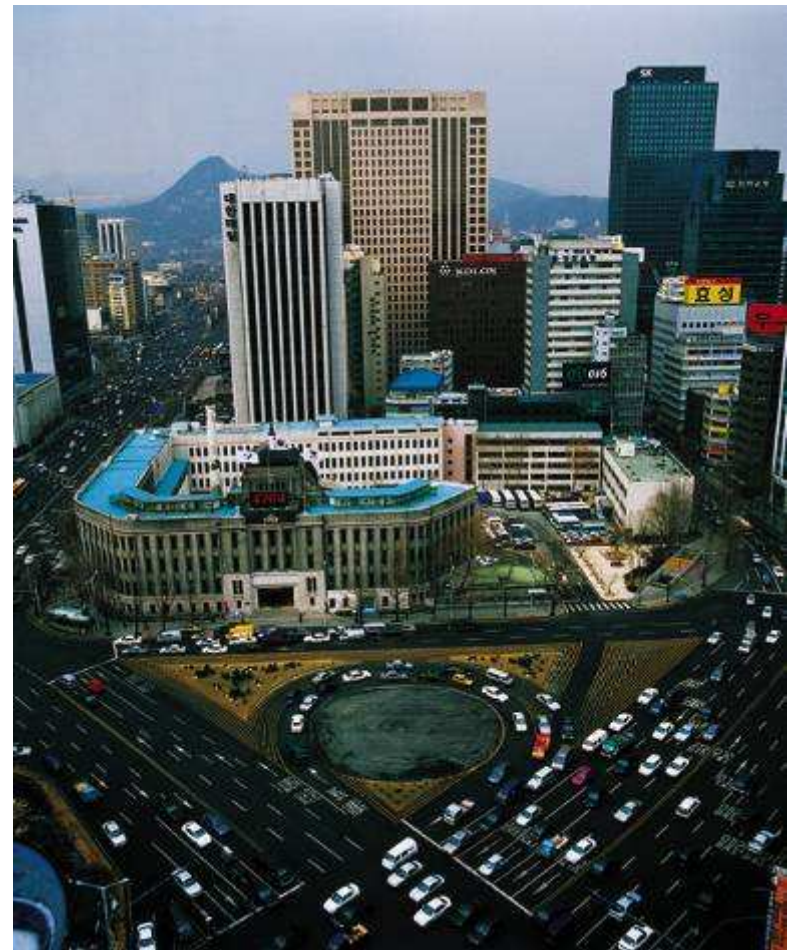
HP OpenVMS

Mission Critical & Secure Computing

Hundreds of thousands systems installed with millions of users

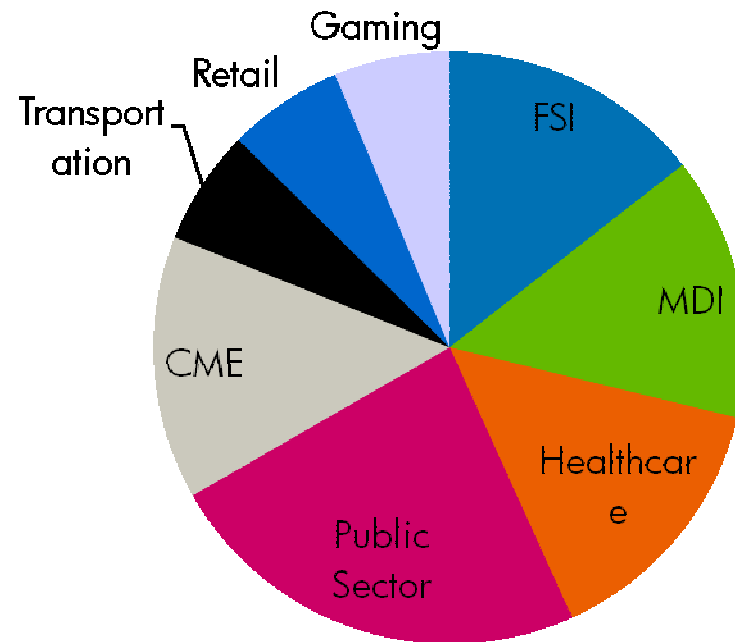
OpenVMS provides the core IT infrastructure for:

- The world's largest CPU chip manufacturing
- Mobile phone billing systems scaling to millions of users
- Major futures and derivative exchanges worldwide
- Majority of automated lottery systems
- Major hospitals
- Many of the world's most demanding Government environments requiring security and availability



✖ OpenVMS_fn_...

OpenVMS Vertical Sector Focus



- Manufacturing & Distribution Industry (MDI)
 - The world's largest CPU chip developer
 - The world's largest chip manufacturer
 - The world's largest camera manufacturer
- Communication, Media & Entertainment (CME)
 - Mobile phone billing systems scaling to millions of users
 - 2/3rds world's SMS traffic
- Public Sector
 - Many of the world's most demanding Government environments requiring security and availability
 - Battlefield radar systems
- Retail
 - World's largest furniture store chain
 - One of the world's largest office supply chains
- Transportation
 - The world's largest employer
 - Many national railway systems
- Financial Services Industry (FSI)
 - Major futures and derivative exchanges worldwide
 - Most of US daily funds transfer
 - Many Banking back-end systems
- Gaming
 - Dominant in automated lottery systems world-wide
- Healthcare
 - Major hospitals
 - Largest Healthcare provider in US

Note: Values are representative not actual

The OpenVMS Value Proposition

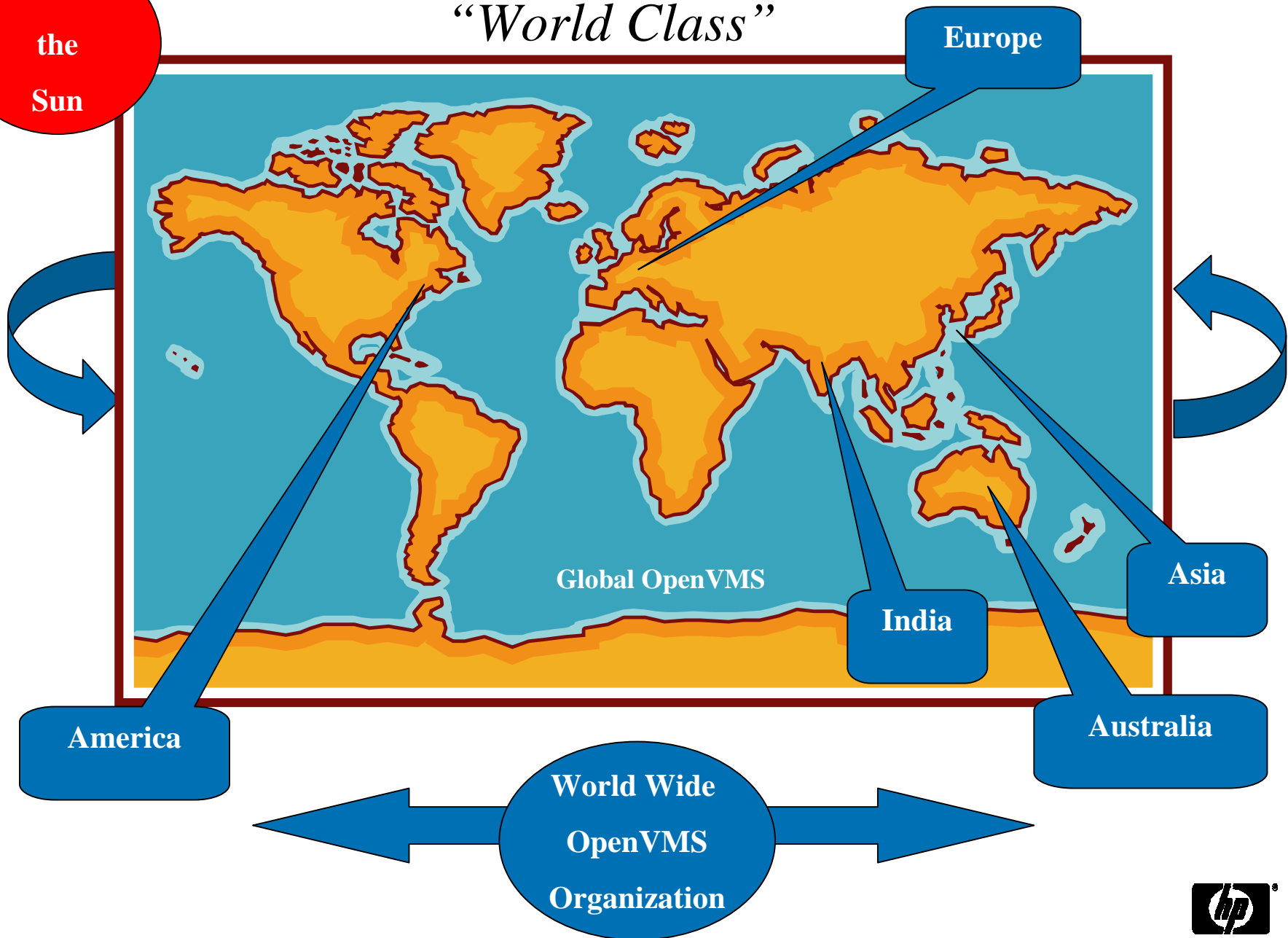
- **Significant technology innovation**
 - Integrity Servers – Industry standard, multi OS, Blades
 - Availability – Disaster Tolerant
 - Clustering – Scalable to 96 nodes up to 800 kms **or more** apart, multi-architecture
 - Security – System and Cluster, Fewest CERT advisories, Never hit by a virus to our knowledge
 - Integration – Premier technologies
- **TCO and TCU**
 - Consistent high scores in “Total cost of ownership” area in user survey
 - High scores for Software Quality & Reliability, Ease of installation ,configuration and administration.
- **Partners**
 - Over 1500 application Ported and available today on Integrity
- **Commitment**
 - Intel and HP’s continued commitment to the Itanium roadmap and Integrity servers
 - HP’s commitment to the OpenVMS roadmap

OpenVMS Investment Areas



OpenVMS Today *"World Class"*

Follow
the
Sun



OpenVMS Community Across HP Today

- Engineering
- Marketing
- Business Management
- OpenVMS Ambassadors
- OpenVMS Professions
- HP Global Service
- HP EDS
- BCS Specialists
- BCS Sales

HP OpenVMS Rolling Roadmaps

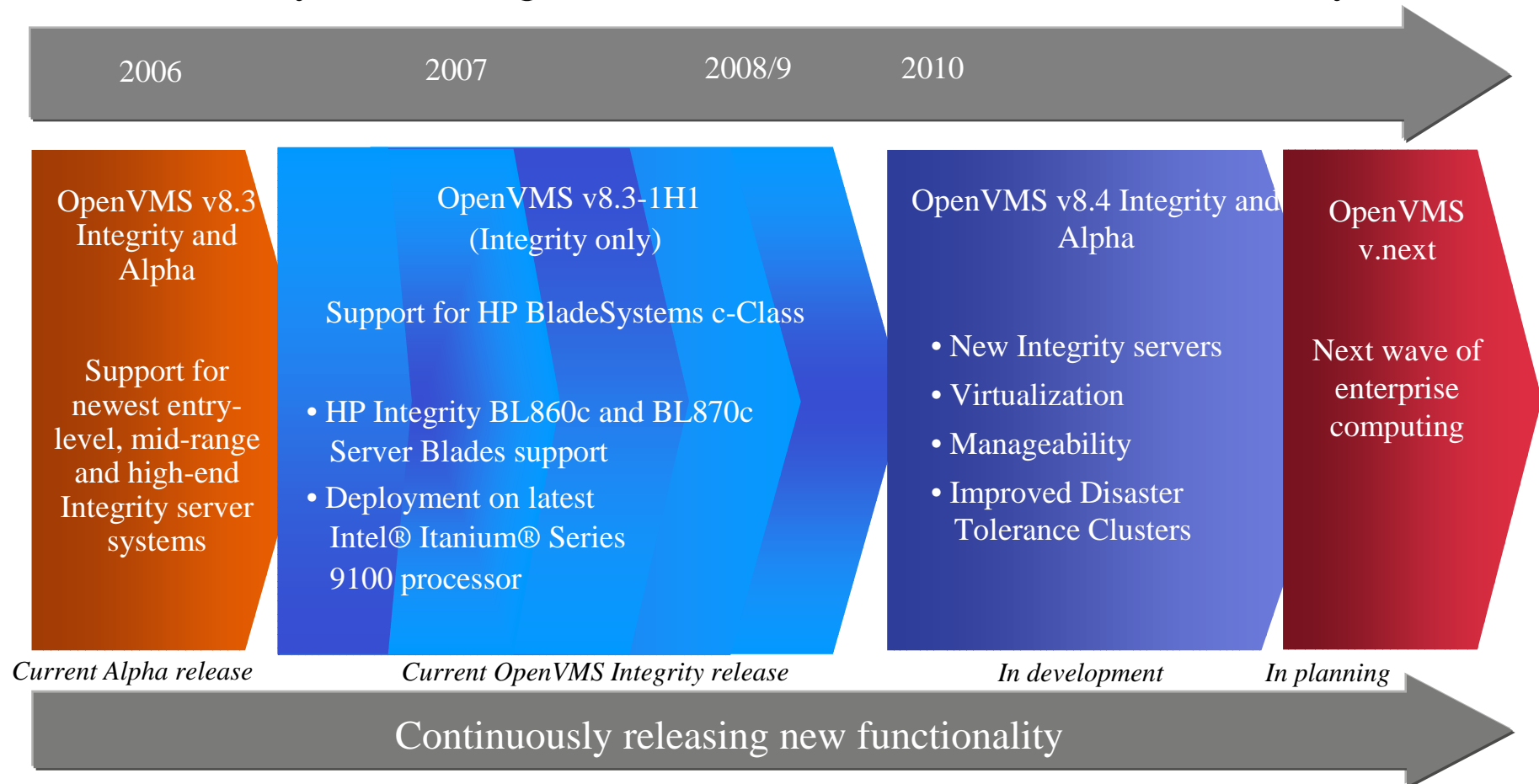
❌ OpenVMS_fn_30AnnivHI

These roadmaps are provided to you solely for your convenience and are updated approximately every 3 months. While it contains our current plans, all information in the roadmaps is subject to change without notice. HP doesn't warrant that we'll introduce any product or feature discussed in the roadmap at any time, nor that the information is accurate.

August 2009

HP OpenVMS Software Roadmap

Continuously delivering mission-critical solutions for over 30 years!



New Releases every 18-24 months

OpenVMS detailed roadmap: http://h71000.www7.hp.com/openvms/pdf/openvms_roadmaps.pdf

OpenVMS Today and Tomorrow

Continuously releasing new functionality

Future releases

- New Integrity systems
- Continued virtualization, performance, security, scalability and management enhancements

H1 2010 OpenVMS v8.4 (Integrity and Alpha)

- Support for new Integrity systems running latest Itanium processors
- Virtualization enhancements on Integrity - OpenVMS v8.4 supported as a guest Operating System in HP-Virtual Machine v4
- Clusters over TCP/IP Protocol
- Host-Based Volume Shadowing with up to 6 member shadowsets
- 2 Terabyte Volumes

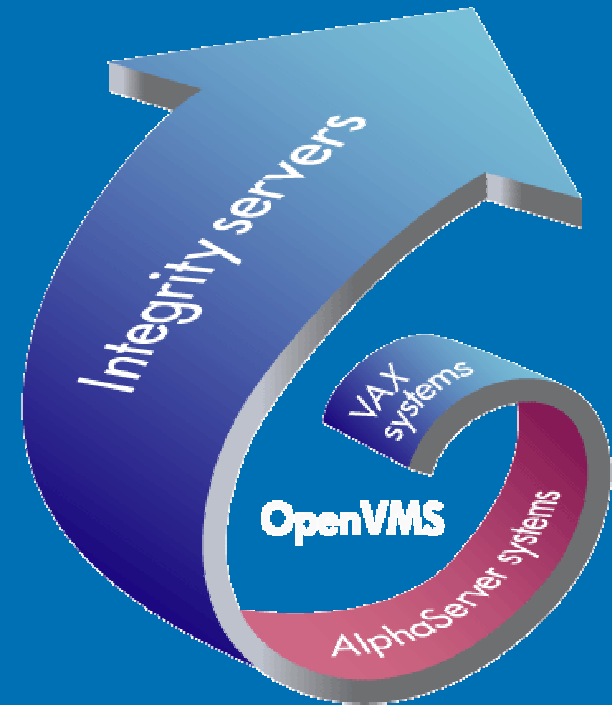
Current Releases:

- OpenVMS v8.3-1H1 (Integrity only)
 - Intel® Itanium® processor 9100 series
 - BL860c & BL870c Blade Systems, c7000 & c3000 enclosures
 - SB40c (Storage Blade), External SAS MSA60/70 (now with shared SAS cluster support), VGA console, PCI-express, 10 Gigabit Ethernet NIC
- OpenVMS v8.3 (Integrity and Alpha)

Time



OpenVMS v8.4 Features



What's New in v8.4? (1/2)

- Support for the latest Integrity server systems
 - Incorporates the latest generation of industry-standard Itanium processors
- OpenVMS as an HP Integrity Virtual Machine (HPVM) guest
 - OpenVMS v8.4 supported as a guest operating system with HP Integrity Virtual Machine v4.2
 - Support for AVIO
 - Online guest migration
 - Cluster support with MSCP/TMSCP
- IP Cluster Interconnect (IPCI) (Alpha and Integrity)
 - IPCI enables use of IP for OpenVMS cluster communication
 - IPCI allows the PE driver, the module in OpenVMS cluster communication, to use IP services
 - IPCI will co-exist with LAN interconnect for cluster communication
 - Enables the discovery of nodes and the formation of clusters in an IP-only network where LAN bridging is not available
- 2TB volume support
 - Maximum volume size has increased from 1TB to 2TB
- Extended membership on shadowing
 - Increase the number of member disks in a host-based volume-shadowing set from 3 to 6 disks

What's New in v8.4? (2/2)

- Provisioning full install with no assumptions
 - Complete install
 - Apply a license PAK
 - Configuration of:
 - TCP/IP
 - Cluster
- Integrity RAD support gives improved performance on NUMA systems
- Serial Attached SCSI (SAS) Smart Array Support
 - Supports next-generation SAS Smart Array HBA and SAS blade interconnects
- Shared SAS blade storage
 - Has solutions to connect multiple HP C-class I64 blade systems to a storage shared over the SAS
- HP TCP/IP services for OpenVMS v5.7 enhancements (Alpha and Integrity)
 - Packet-processing engine
 - FTP over SSL
 - IPCI
 - SCTP



Detail on

Features

New

Virtualization

- VSE Suite
 - Management of all physical, logical, and virtual resources from a ‘single pane of glass’
- Capacity Advisor
 - Tool for assessing the impact of adding a new work stream, reorganizing system configurations, upgrading systems, splitting workloads, etc.
- iCAP for Integrity cell-based systems
- Enhanced blade management
 - Continued addition of WBEM-based ‘Providers’ on blade systems enabling more and more aspects of these systems to be managed from a single ‘pane of glass’ based on Systems Insight Manager (SIM)
- Full operating system provisioning
 - Ability to simultaneously provision and/or upgrade up to 8 Integrity or blade systems remotely from the common SIM
- WBEM services
- System Management Homepage (SMH) – Free download
 - Provides a framework for seamless consolidation of different management tools, as well as a framework to simplify the management of individual Alpha and Integrity servers running OpenVMS
- SNMP management agents

Performance, Storage, and I/O

- Performance improvements
 - Add Memory/strcmp API's on Integrity servers
 - Reduces the compute time of memcmp/strcmp routines on Integrity server platform
 - Improved 'Exception Handling' on OpenVMS I64
 - Global Section unmap related changes
 - Inner mode semaphore upcalls for Kernel and Exec mode
 - System Service dispatch
 - Pthread spinlock algorithm improvement
 - Reducing I-cache Flushes
 - Changes memory management to reduce the number of instruction cache (I-cache) flushes
 - Dynamic enabling/disabling of XFC Cache for Mounted Volumes
 - New features in XFC to enable/disable cache dynamically for mounted volumes
 - PCSI Validation of VMS Integrity Product Kit
 - Provides a mechanism for authenticating and validating the OpenVMS Integrity operating system product kit (the "VMS kit") during installation or upgrade
- Storage and I/O
 - Backup enhancements (Alpha and Integrity)
 - Compression support on disk allows BACKUP to generate compressed save-sets
 - Support for 2TB files
 - Compression support on tape allows BACKUP to create and restore the compressed save sets on sequential devices

Volume Shadowing and System Management

- Volume-shadowing enhancements
 - On-demand write lock, LBN-based read selection and Multiple Minicopy Bitmaps
- System management
 - Insight Power Management (IPM)
 - Integrated solution to manage, analyze, and optimize physical, logical, & virtual resources on Integrity & blades
 - Support power state change requests from iLO management processor to VMS via ACPI
 - Availability Manager v3.1-1 on OpenVMS (Alpha and Integrity)
 - TDC v2.4 for OpenVMS (Alpha and Integrity)

Unix Portability

- Symlinks rewrite
 - Supports logical names in Posix filenames and symlinks
 - Loop detection in RMS-directory wildcarding
 - Symlinks in RMS-directory wildcard search
 - Redesign of on-disk symlink representation
 - A volume characteristic to enable/disable symlinks (and other special files)
- Full CRTL Semaphores
 - Support for the Open Group semaphores (POSIX and System V) control operations to the CRTL
- CRTL Support for UTF8
 - Support for UTF-8 format file specifications when given in UNIX style
- GNV update

Security and Networking

- Security
 - SSL refresh (Alpha and Integrity)
 - Based on new openssl.org base level, 0.9.8E, includes new cryptographic algorithms
 - Active Directory (LDAP) Auth Support (Alpha and Integrity)
 - Add mapping of login name to VMS username in LDAP authentication
 - Secure delivery enhancements (Alpha and Integrity)
 - New, corporate-wide signing standard which requires all kits shipped to customers to be signed by a central HP signer
 - Kerberos – Based on v1.4.1
 - CDSA – v2.3
- Networking
 - DECnet v8.4 enhancements (Alpha and Integrity):
 - DECnet over IP connections to pass through SSH
 - OSI transport connection failure events to contain information about the involved “TSAP”

the

Hardware

- The Intelligent Platform Management Interface (IPMI) driver
 - Support features required for the IPMI I driver to work with newer platforms
- USB enhancements (Alpha and Integrity)
 - Support for new USB controllers
 - Existing drivers modified to work without I/O translation buffers
 - New driver for the Universal Host controller interface
 - Support for a 64-bit data buffer version of the High-Speed controller
 - Support for high-speed boot
- vKVM
 - “Virtual” USB keyboard and mouse implemented in firmware by the management processor
 - Allows a remote user to control a system as if they were using a VGA monitor and keyboard directly attached to the local system
- Sound card driver on OpenVMS Integrity
 - Support for audio driver for sound card on OpenVMS Integrity to create a simple “beep-out” for a set of specified conditions
- InfoServer on EFI Drivers
 - Updates the InfoServer application to boot in a manner similar to satellite boot on Integrity servers today

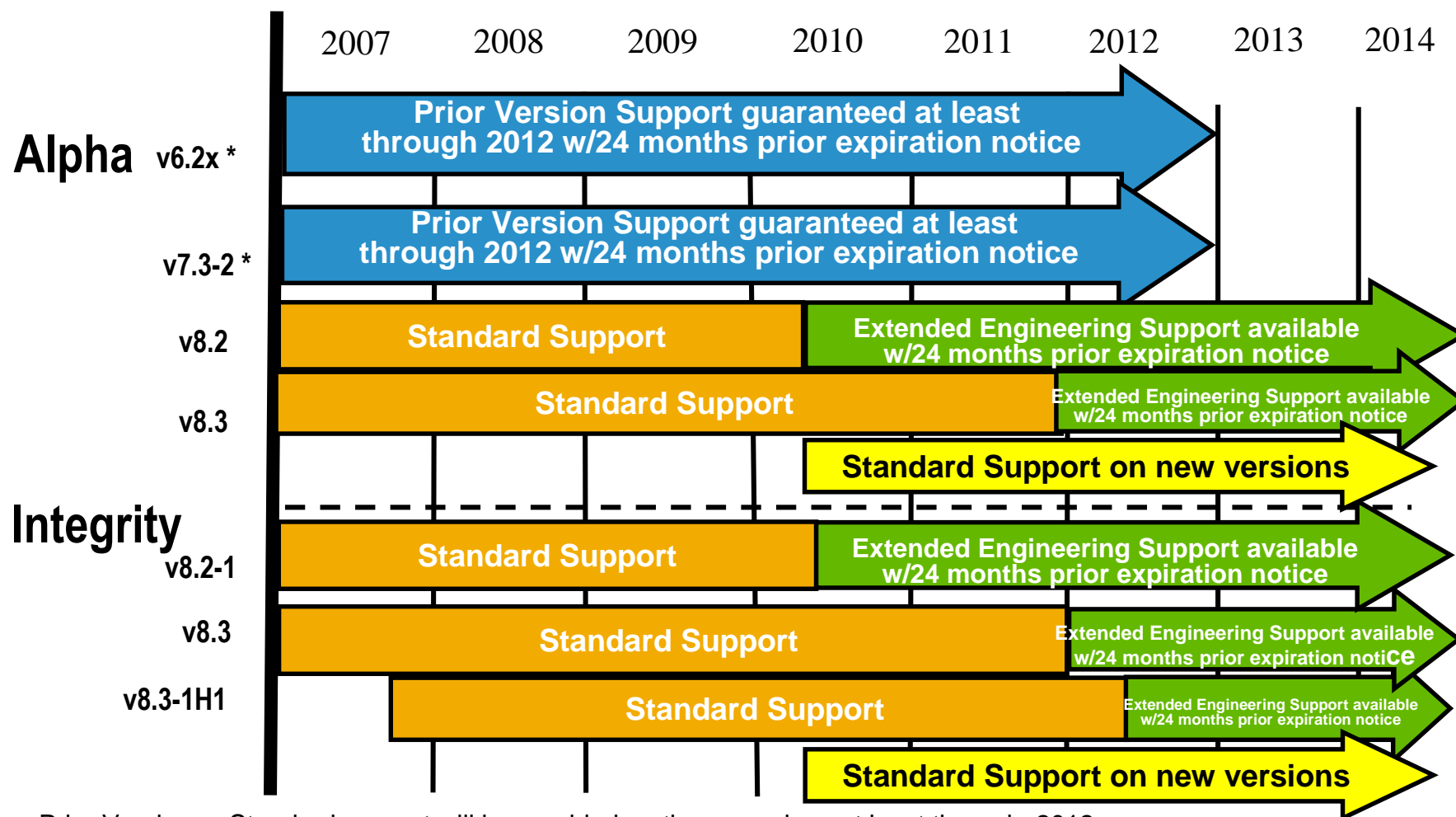
Utilities Enhancements

- Large device name support for accounting utility (Alpha and Integrity)
 - Longer device name support allows 16-character long terminal names
- Support for more than 255 characters in mail headers (Alpha and Integrity)
 - Removes OpenVMS mail limitation of maximum 255 characters
- Mail interface message placement (Alpha and Integrity)
 - Provides new callable MAIL API “mail\$put_message_in_folder” that allows the caller to place the message directly in folder specified
- Support for forwarding entry limit to be more than 32 characters (Alpha and Integrity)
 - Increases the forward entry size of USERNAME field from 32 to 512 characters
- Delete/tree
- Support for more than 8 parameters in DCL scripts

Misc. New Features

- Per-process kernel threads limits
 - The number of created kernel threads controllable on a per-process basis
- PageDyn LALS (Alpha and Integrity)
 - Implement optional PageDyn LookAside Lists (LALs) for customers experiencing severe Paged Dynamic Pool free list fragmentation
- Dynamic Processor Resiliency (DPR)
 - Recognize degrading processors
 - Indict and eventually remove (deallocate) them from the running system
 - Replace them with iCap resources (if possible)
 - Mark an indicted processor as not available for use on the next reboot (deconfigure)
- Partial dump copies (Alpha and Integrity)
 - Allows a system dump to be broken up into smaller portions so that only needed portions are copied over the network, and multiple portions can be recombined when analyzing a crash

OpenVMS Service Support Roadmap



• Prior Version or Standard support will be provided on these versions at least through 2012.

** w/24 mo notice: A 24-month notification will be provided before support is ended.

Standard support ends when the 2nd subsequent release ships. HP supports the current version and one back.

Extended Engineering Support will be available for additional cost. Future version shipment dates are estimates.

Customer and Partner Focus



Office of OpenVMS Customer Programs

- Nerve center for all OpenVMS customer programs
 - Continue to nourish our strong relationships with Customers, Partners and ISV's.
 - Assist field deliver quality OpenVMS technical solutions
 - Connect HP OpenVMS Experts to customers/partners on long term basis
 - Evangelize OpenVMS through technical programs
 - HPTF, Technical Update Days (TUD), Tech talks, Connect, VMS Tech Journal, Hobbyist, Edu Programs and other programs
 - Designed for both business and technical audience
 - OpenVMS Ambassadors program
 - Direct customer information shaping long term product development
 - Access to HP Technologies through Customer Lab
 - E-mail: OpenVMS.Programs@hp.com

OpenVMS Customer Lab

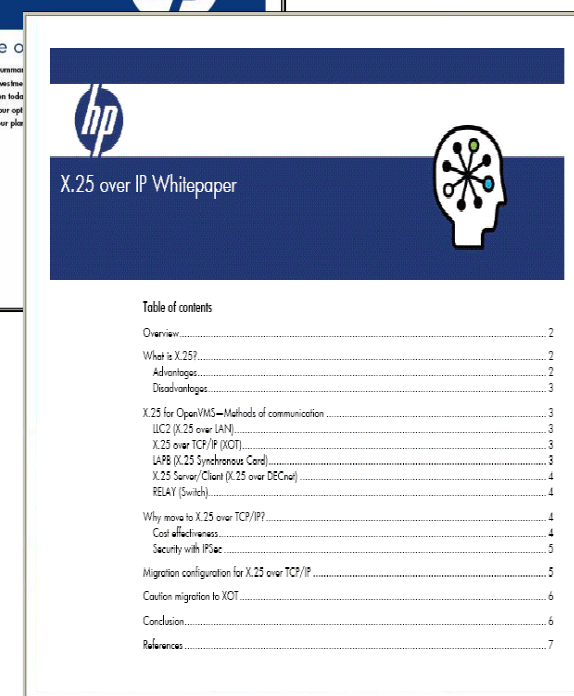
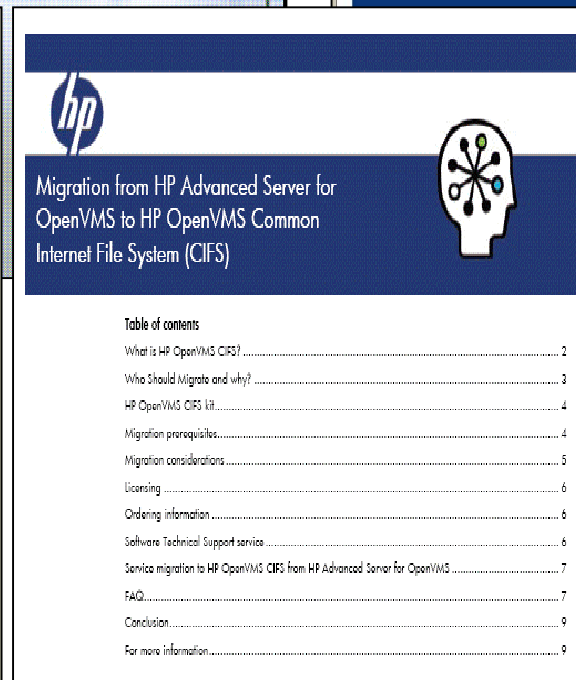
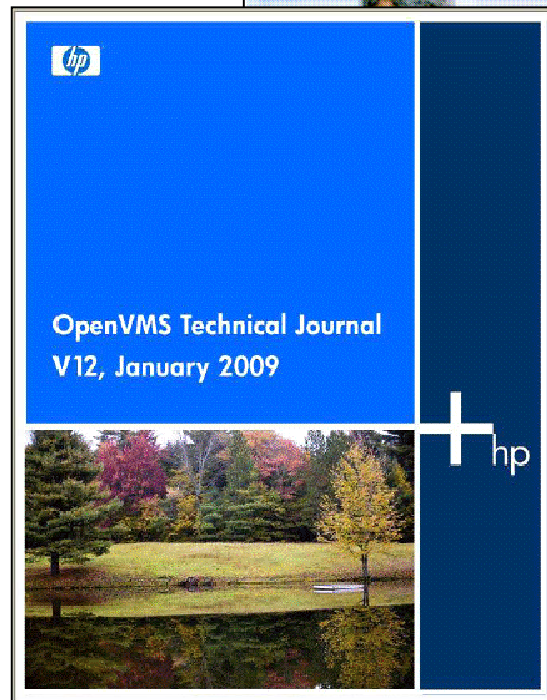
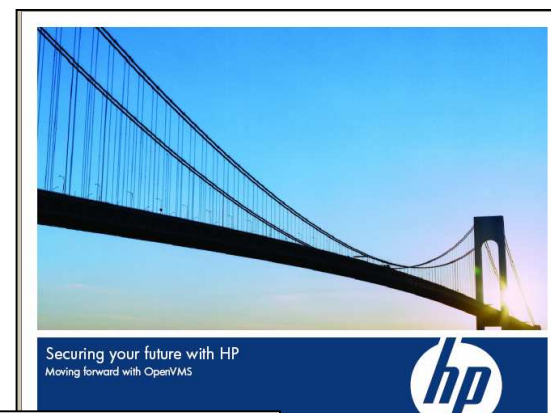
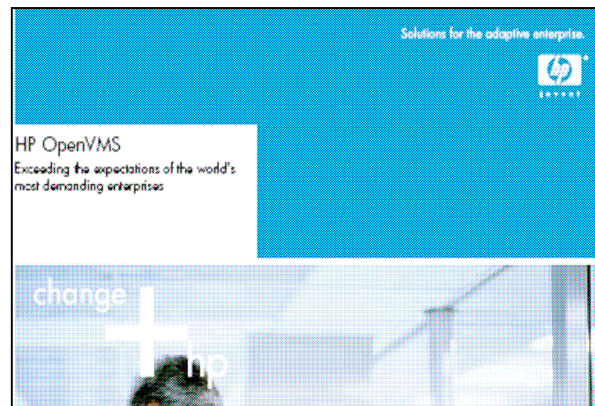
- Do you need to know exactly how fast your OpenVMS application will run on Integrity servers?
 - The OpenVMS Customer lab is the answer
- The perfect place to establish the proof points you need to size your OpenVMS solutions on Integrity
- The Customer Lab personnel have already assisted hundreds of Customers and Partners in migrating to Integrity
- For more info, please see
<http://h71000.www7.hp.com/custlab/index.html>



OpenVMS Marketing



OpenVMS Publications



Partnership for Technical Publications

the **Availability Digest**

NHSBT
UK National Health Service – Blood & Transplant
October 2008

NHS Blood & Transplant (NHSBT) is part of the UK's National Health Service and is responsible for blood services and organ transplantation throughout the UK. The organization manages the supply of blood to hospitals throughout England and North Wales, tracking blood from when it is first donated, through its testing and separation into various products, and, finally, to its dispatch to hospitals.

NHSBT has a particularly important role to play following any major incident where people might be injured and where blood is urgently needed to save lives. Therefore, the efficient operation of NHSBT's computing infrastructure is of paramount importance in ensuring that patients receive the blood they require.

To ensure the effective management and processing of data under all circumstances, NHSBT has two physically separate data centers using split-site OpenVMS clusters that provide multiple levels of redundancy. NHSBT has recently delivered a major upgrade to this system – an upgrade that was accomplished with minimal disruption to service. This article describes the development and delivery of the new NHSBT system.

NHSBT Facts & Figures

NHS Blood & Transplant's services include:

- promoting blood, tissue, and organ donation to the public.
- managing the supply of blood to hospitals in England and North Wales.
- working with hospital colleagues to promote the safe and appropriate use of blood.
- providing a range of tissues to hospitals.
- managing organ donation in the UK.
- managing the British Bone Marrow Register.

There are roughly 2.5 million blood donations per year. NHS Blood & Transplant (www.blood.co.uk) tracks and manages these blood donors and the blood they donate. NHSBT is the sole provider of blood and the majority of blood components to the National Health Service in England and North Wales and also to private healthcare providers.

Every blood sample is individually screened, identified, and tracked. A blood sample is usually split into one or more products, including red cells, plasma, and platelets. These products are stored in thirteen centers around the country.

the **Availability Digest**

OpenVMS Active/Active Split-Site Clusters
June 2008

HP OpenVMS clusters offer a dramatic improvement over contemporary cluster technology. Nodes in an OpenVMS cluster run in an active/active mode in which multiple nodes across multiple sites cooperate in a common application against a common, distributed file system. The recent "Disaster Proof" video from HP,¹ in which a data center was blown up, showed that OpenVMS had the fastest recovery time of all the clustering technologies used (OpenVMS, HP-UX, NonStop, Windows and Linux).

In our earlier article on clusters,² it was pointed out that contemporary clusters do not run in an active/active mode in our sense because a disk volume can be mounted only on one node at a time (unless Oracle RAC is used), and only that node can participate in the application. Consequently, when a node fails, the application has to be started on another node, the volume remounted and repaired, and the users switched. This leads to failover times for contemporary clusters measured in minutes or more.

Like active/active systems, OpenVMS clusters recover in seconds because once a failure is detected, all that must be done to continue operation is to switch the subset of users who were connected to the failed node to surviving nodes at any of the sites. Furthermore, no data is lost following a failure (a Recovery Point Objective, or RPO, of zero is achieved) because the application file system copies are updated synchronously.

OpenVMS Cluster Overview

An HP OpenVMS cluster is a shared-everything cluster that can have up to 96 nodes³ distributed over one or more geographically-separated sites. Redundant data storage is organized as shadow sets using HBVS (Host-Based Volume Shadowing). Each disk (or presented storage device in a fibre channel disk array, where each presented device could itself be a RAID 0+1 entity) can be a member of a shadow set, and a shadow set can have up to three members. All disk members of a shadow set are exact copies of each other.

The three members of a shadow set may be distributed across as many as three of the nodes in the cluster. When fibre channel disk arrays in a storage area network are used, all nodes have simultaneous access to all shadow set members. (The three-member limit is currently being increased with an architectural limit of sixteen members and with support for up to six members anticipated). A cluster can support up to 500 disks in multiple-member sets or up to 10,000 disks in single-member sets.

Posted with permission from Availability Digest, www.availabilitydigest.com

OpenVMS Marketing Outreach

<http://www.hp.com/go/openvms>

OpenVMS.org



Surveys

Announcements

- Golden Eggs
 - SAS MI Cluster
- HP BCS 2009 Marketing initiatives include OpenVMS
 - Webcast
 - BCS Blades January-April
 - Podcast
 - Starting H2

OpenVMS Podcast Available

OpenVMS Freeware Program Refresh

Launching Q1 2010

- Freeware available via web downloads starting early 2010
- Developers , Hobbyist can submit freeware to HP OpenVMS team by end of 2009
- For more information stay tuned – Freeware Program details coming soon at www.hp.com/go/openvms

OpenVMS Fundamentals Training

Interactive, distance learning from HP Education

- HP OpenVMS customers can access OpenVMS Fundamentals training via the new, interactive distance learning program
- Pre-recorded, instructor-led online, self-paced course
- Includes an OpenVMS simulated environment on which students can practice
- Offers a follow-on opportunity to access the HP Virtual Lab for hands-on practice in a fully configured OpenVMS environment, with live mentoring from an OpenVMS expert.
- Content is the same as taught in the instructor-led version.
- Full curriculum offered on OpenVMS Course offerings, schedule and registration: www.hp.com/learn/openvms

