VMS STRATEGY AND FUTURES

Ray Turner
OpenVMS Ambassador &
Technology Consultant.
Hewlett Packard

OPENVMS: MOVING STRONGLY INTO ITS 4TH DECADE WITH FULL HP COMMITMENT

OpenVMS_fn_30AnnivHI

- OpenVMS profile
- Investment Strategy & Roadmap
- ISVs, Partners & Customer Programs
- Marketing Activities
- Summary

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

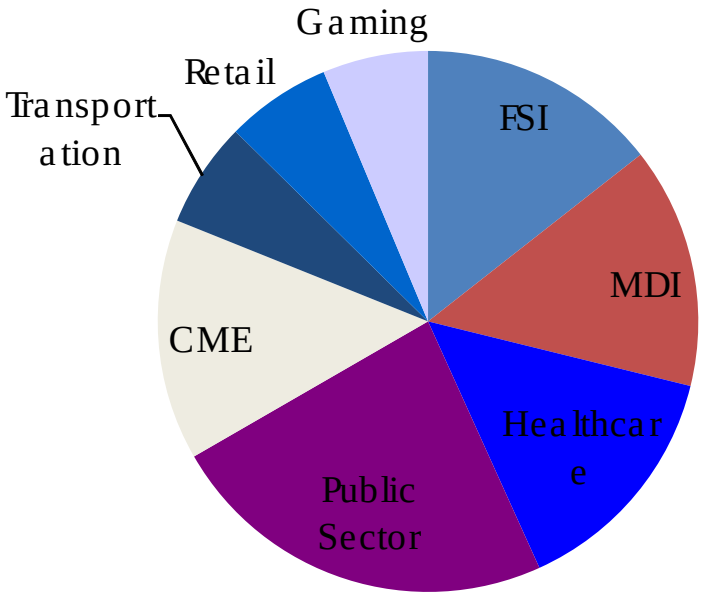
HP OpenVMS MISSION-CRITICAL & SECURE COMPUTING

Hundreds of thousands of systems installed, millions of users

OpenVMS provides core IT infrastructure for:

- World's largest CPU chip manufacturer
- Mobile telecom billing systems scaling to millions of users
- Prominent futures and derivative exchanges worldwide
- Majority of automated lottery systems
- Large hospitals
- Government offices worldwide demanding security & high availability

OpenVMS Vertical Sector Focus



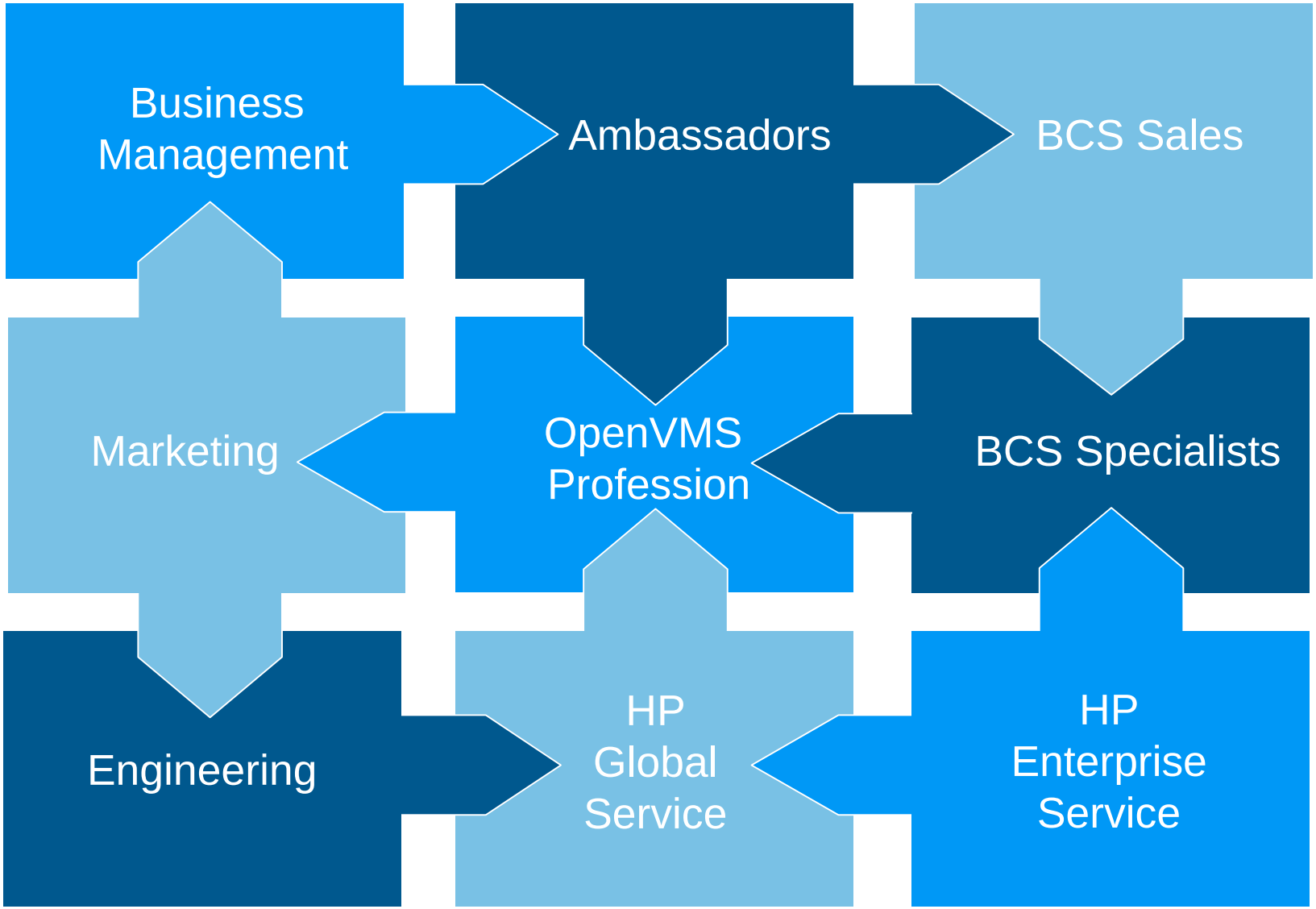
- Manufacturing & Distribution Industry (MDI)
  - The world's largest CPU chip developer
  - The world's largest chip manufacturer
  - The world's largest camera manufacturer
- Communication, Media & Entertainment (CME)
  - Mobile phone billing systems scaling to millions of users
  - 2/3rds world's 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

NHS
Blood and Transplant

RECENT DEPLOYMENTS & MIGRATIONS TO HP INTEGRITY

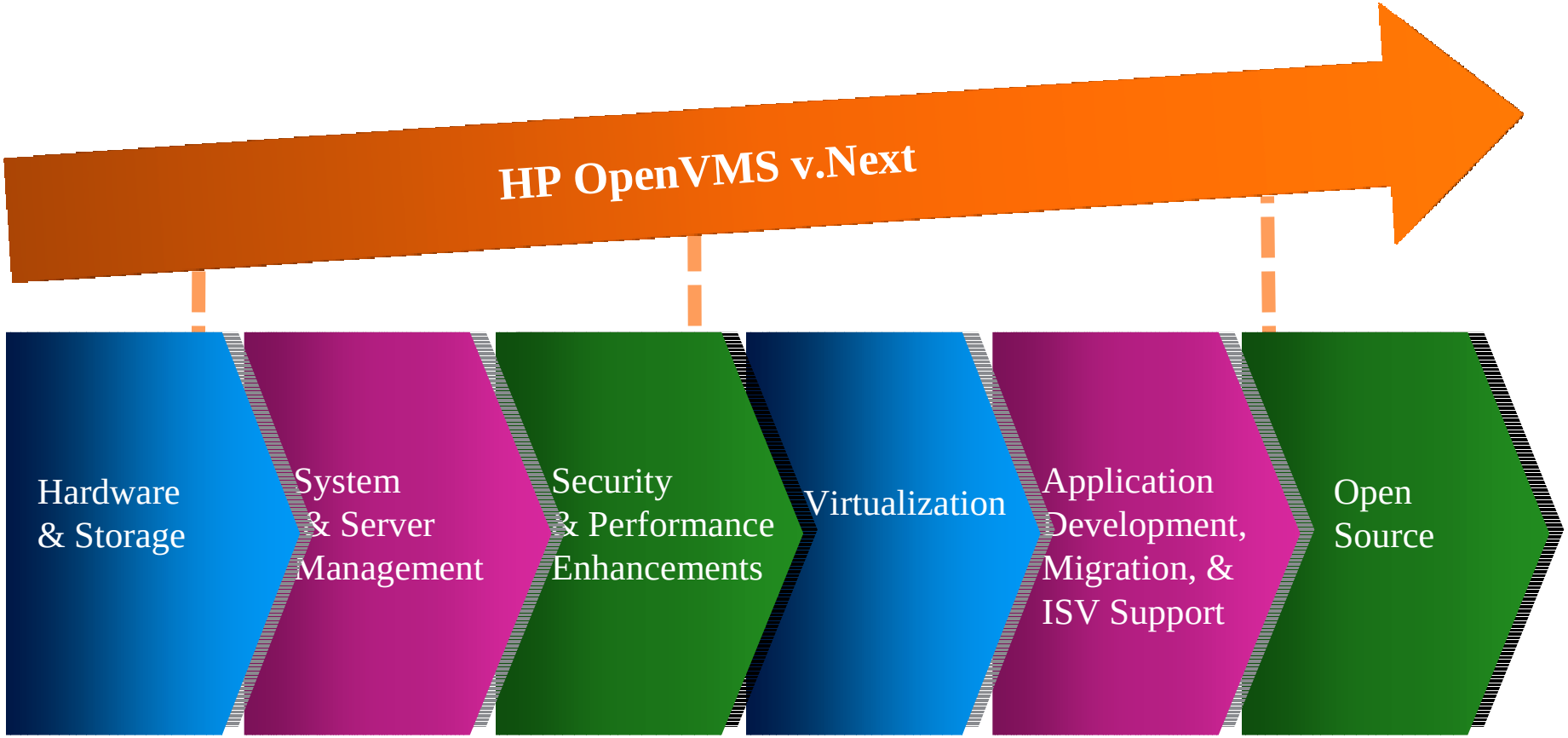
- Large telecom operator in South America moved to OpenVMS on Integrity
  - ***Enhanced performance by 80%***
- Prominent insurance company in Canada moved all applications from Alpha to Integrity
- Major online medical prescription provider transitioned to OpenVMS on Integrity
- Significant bank in Europe adopted Integrity

OPENVMS COMMUNITY ACROSS HP



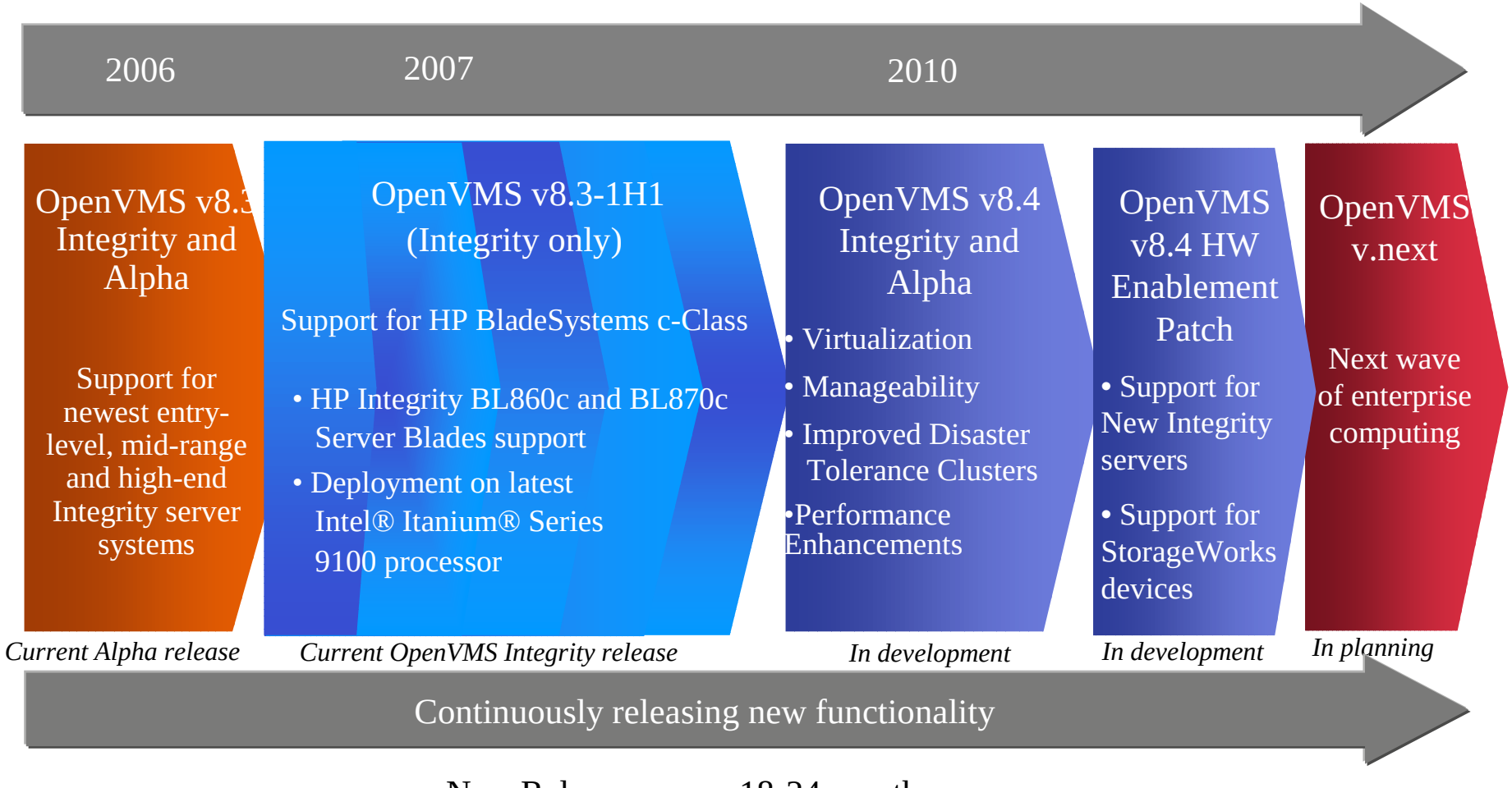
HP OPENVMS V.NEXT

SOLID FOUNDATION MOVING FORWARD



HP OPENVMS SOFTWARE ROADMAP

Continuously delivering mission-critical solutions for over 30 years!



New Releases every 18-24 months

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Dates and content subject to change without notice.

OPENVMS TODAY AND TOMORROW

Continuously releasing new functionality

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

- OpenVMS v8.4 HW Enablement Patch – Q3 2010
  - New Integrity Systems running Itanium processors
  - New HP StorageWorks device Support

- OpenVMS v8.4 (Integrity and Alpha)
- Field Test: 2009 , Launch: June 2010
  - OpenVMS as a guest operating system on HP Virtual Machine
  - Clusters over TCP/IP Protocol
  - Host-Based Volume Shadowing with up to 6 member shadow sets
  - 2 Terabyte Volumes
  - Performance Enhancements

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

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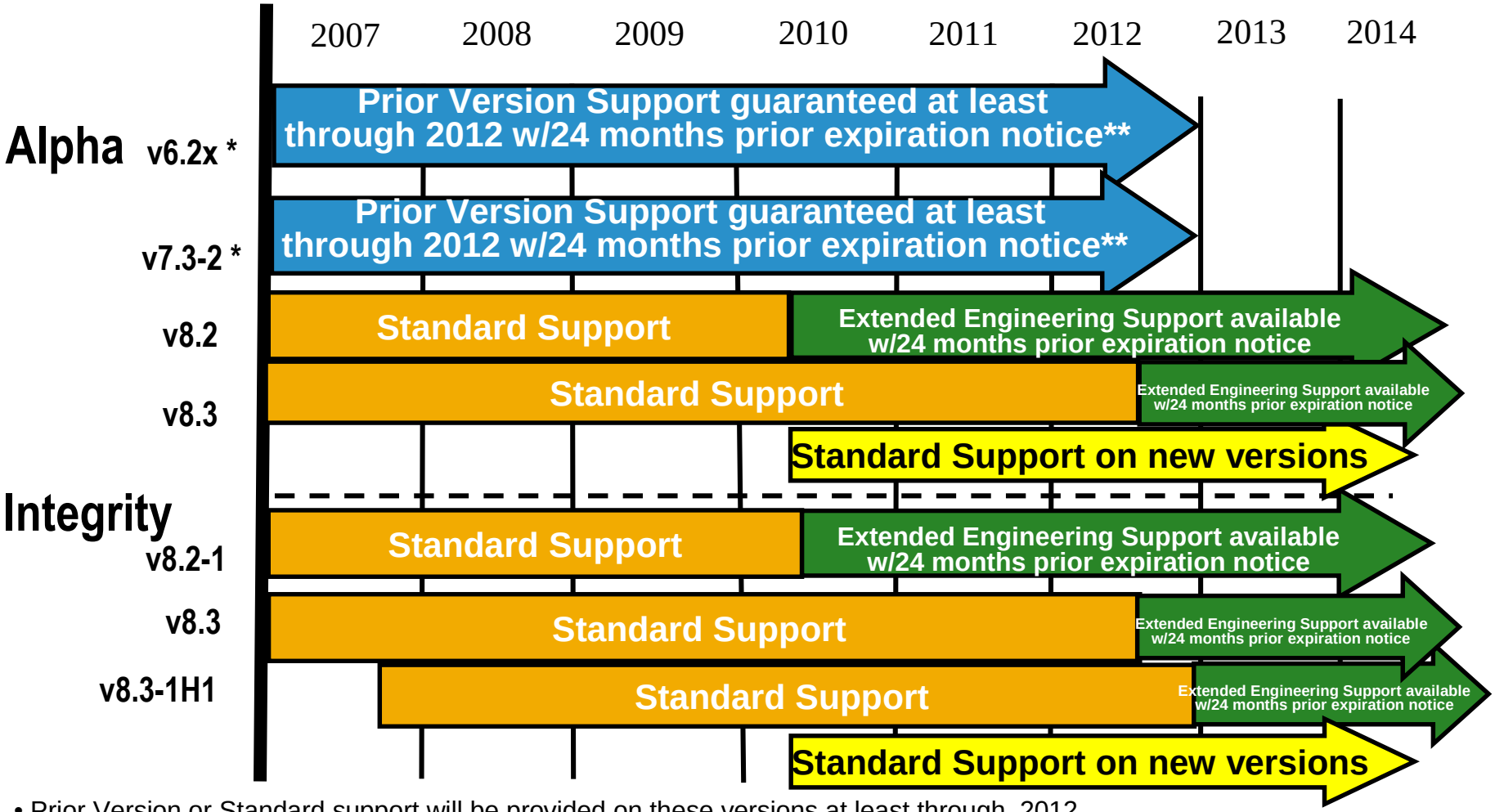
OPENVMS SERVICE SUPPORT ROADMAP



• 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.

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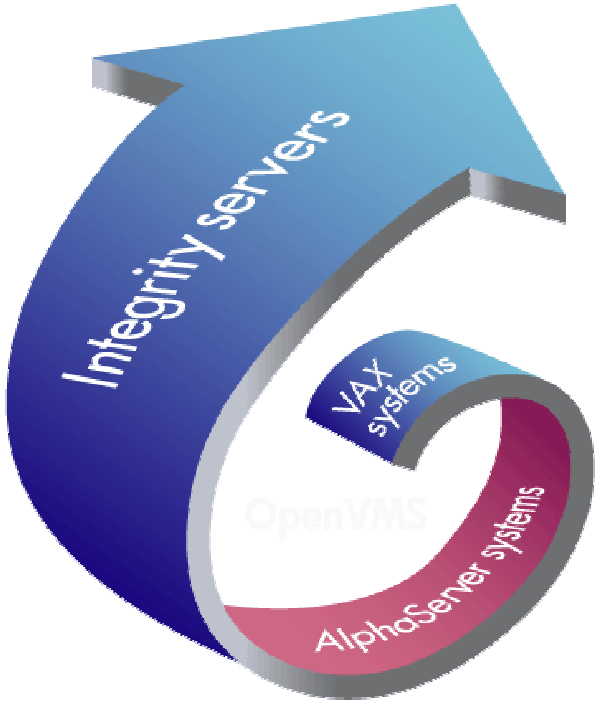
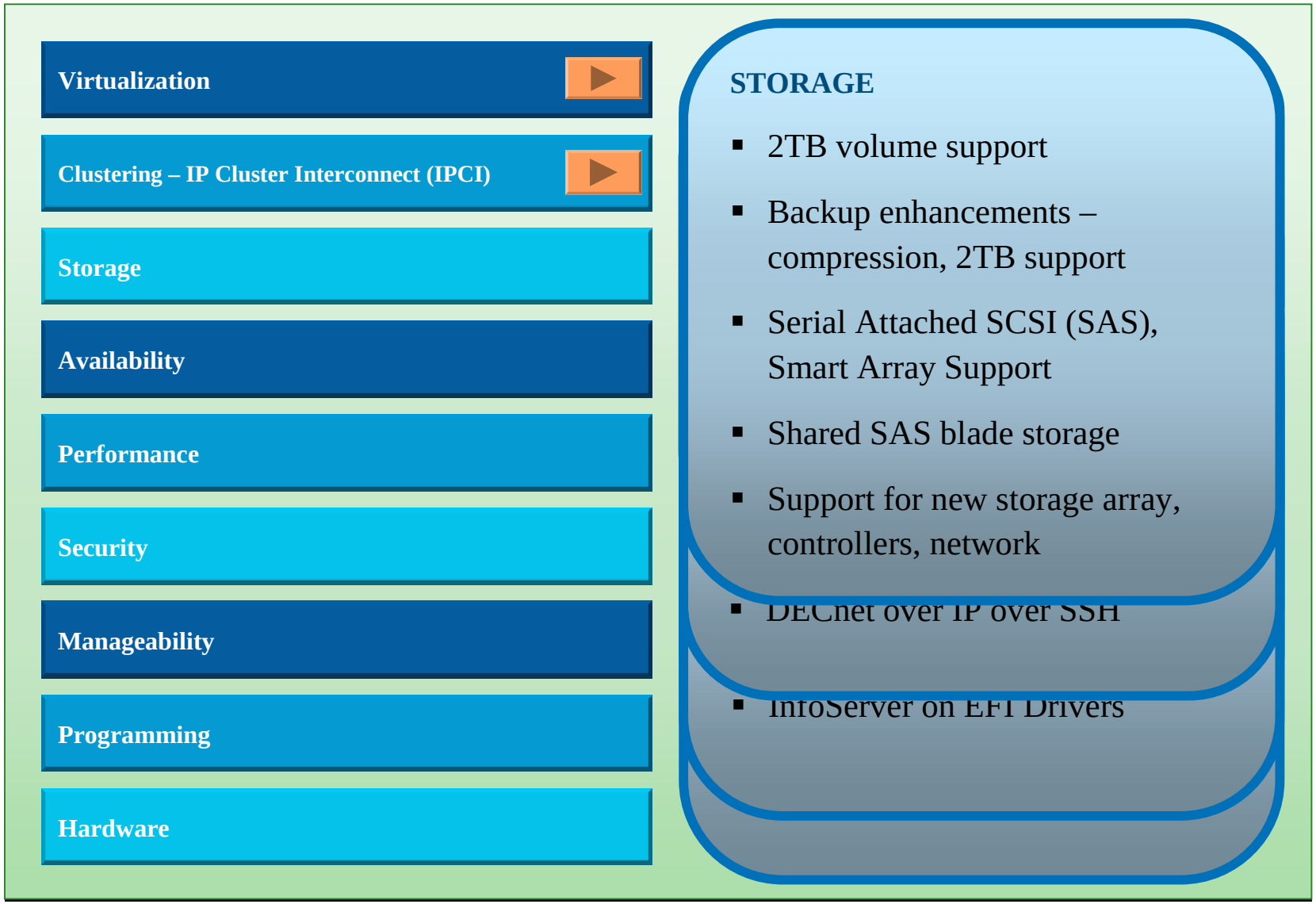
Dates and content subject to change without notice.

LATEST ON OPENVMS

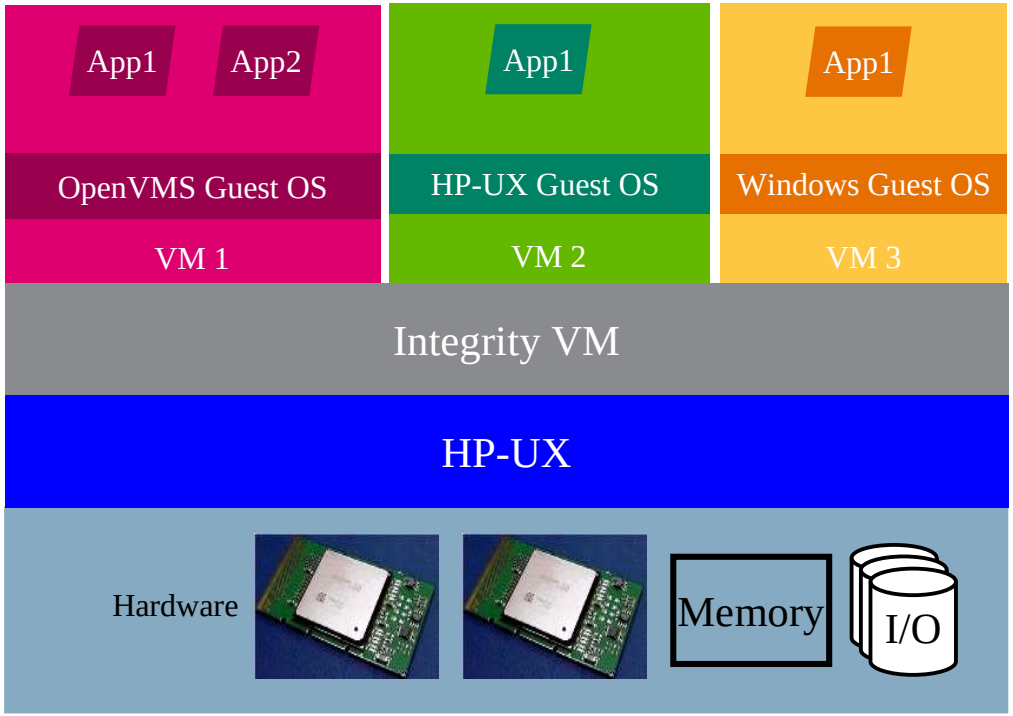
What's new with HP OpenVMS?	
20 Product Updates	• RTR v5.2 • ABS v4.5 • CIFS v1.1
OpenVMS v8.4 Field Test	• 200 beta customers • Over 40% of beta testers have volunteered to give customer references / testimonials
Rich Partner Ecosystem	• Over 1500 OpenVMS applications now on HP Integrity • Over 90% of ISVs with OpenVMS applications have migrated to HP Integrity
Integrity Adoption Up	• HP Integrity revenues continue to grow each year • Migrations to HP Integrity span all industries


Integrity servers
VAX systems
AlphaServer systems
OpenVMS

Enhancements in OpenVMS V8.4



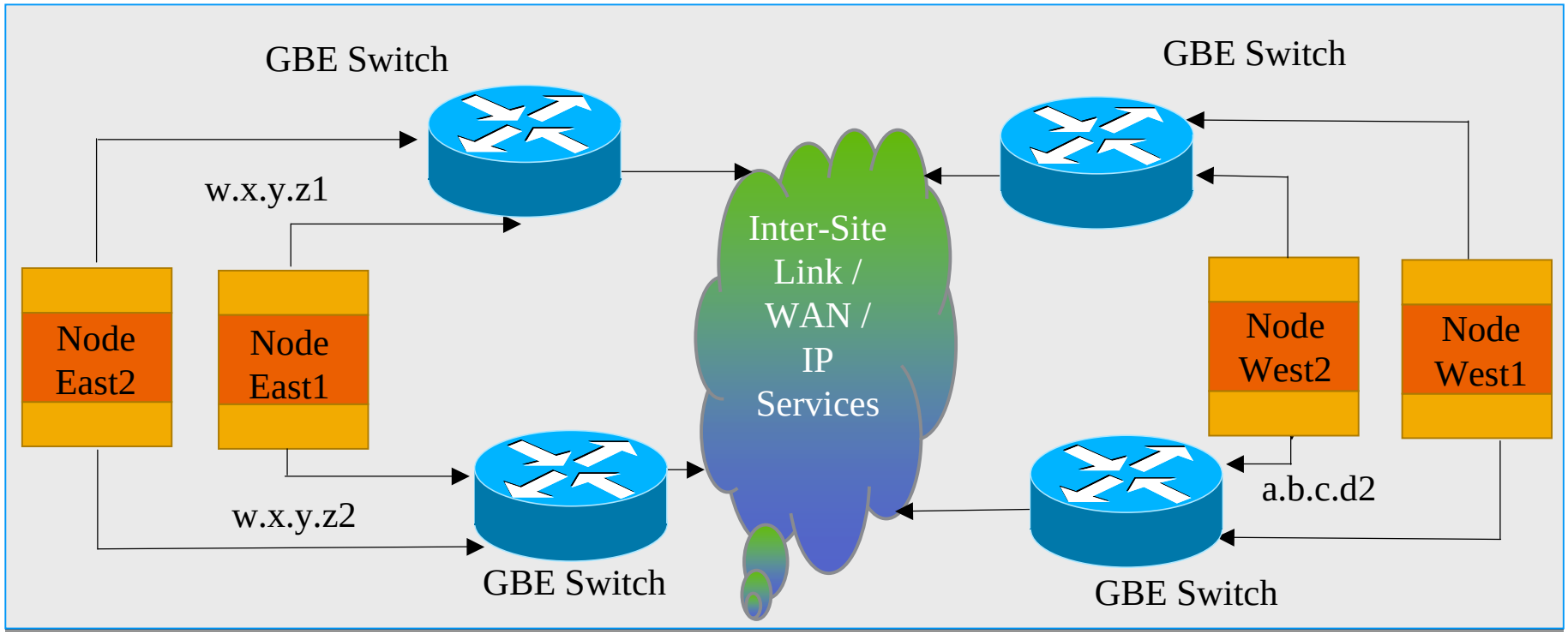
OPENVMS AS GUEST VIRTUAL MACHINE (VM)



- Guest As Applications
- Dynamic Resource Allocation
- OS Fault & Security Isolation
- Heterogeneous Guests (OpenVMS, HPUX, Linux, Windows)
- Any Integrity Hardware, Blade, or nPar

Optimum Utilization Across Multiple OSs

CLUSTER USING
IP CLUSTER INTERCONNECT (IPCI)



- Nodes East1, East2, West1, West2 can be part of the same or different LAN for cluster communications using IPCI
- East1 and West2 have a Virtual Circuit (VC). VC consists of IP channels for SCS traffic.

V8.4 MAJOR NEW FEATURES

- 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

V8.4 MAJOR NEW FEATURES

- Provisioning full installation using HP Systems Insight Manager (SIM)
  - Complete installation
  - Apply a license PAK
  - Configure TCP/IP
- 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

HARDWARE

- Storage
  - 8Gb FC Qlogic cards (standup & mezzanine)
  - MSA2000sa - SAS connectivity
  - 8Gb MSA2000 FC G3
  - D2600 and D2700 - Entry level SAS JBOD storage
- 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

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
  - 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
  - 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 the information about the involved “TSAP”

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$put_message_in_folder” that allows the caller to place the message directly in folder specified
- Delete/tree
- Support for 16 parameters in DCL scripts (increased from 8)
- F$CUNITS (convert units) enhancement (Kbytes, Megabytes, Gigabytes and Terabytes)

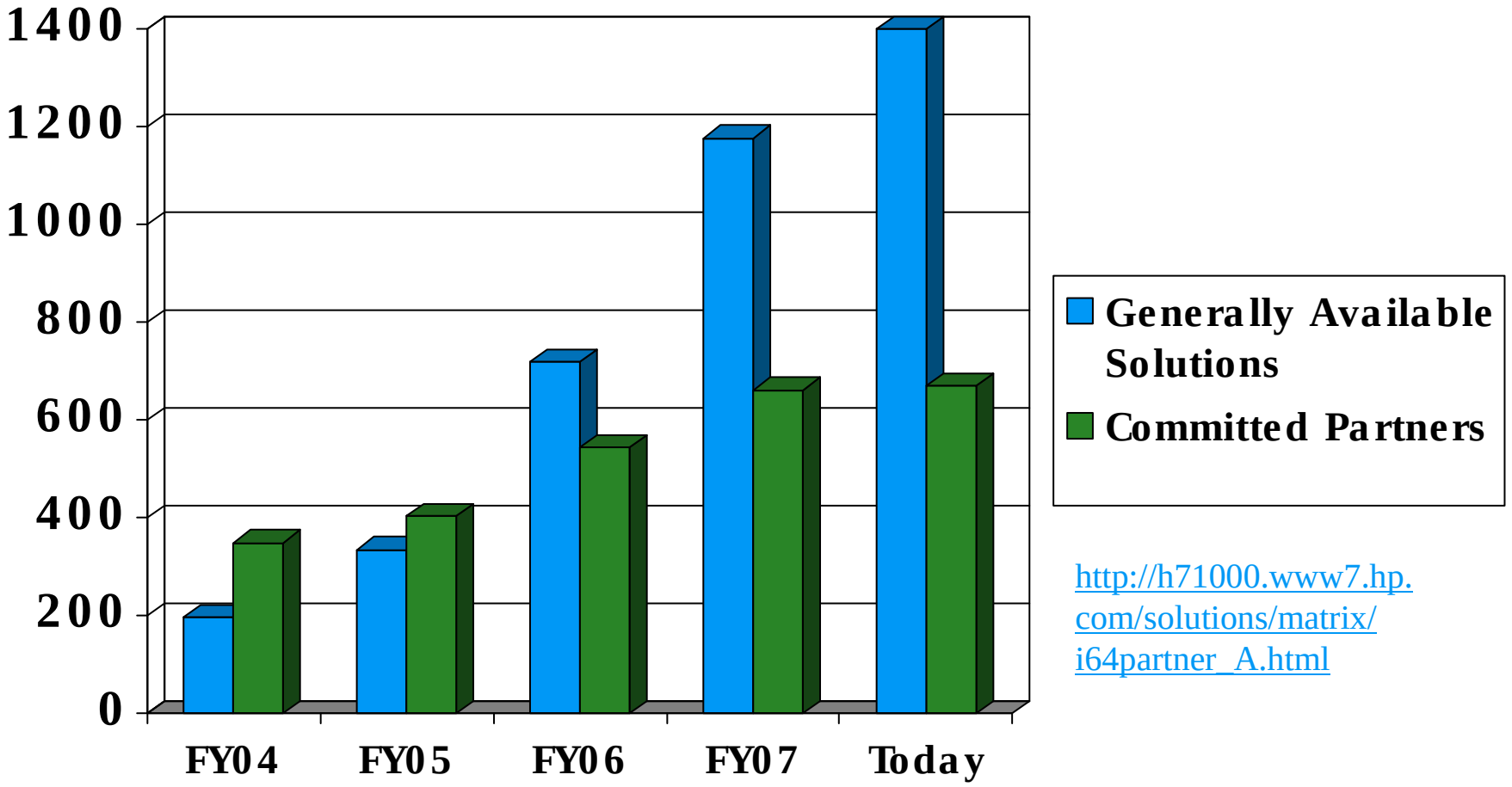
MISC. NEW FEATURES

- 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

OUR ISV PARTNERS CONTINUE TO INVEST IN OPENVMS

Recent

Adabas by Software AG



http://h71000.www7.hp.com/solutions/matrix/i64partner_A.html

90% of OpenVMS Applications are now on Integrity.

A SAMPLE OF OPENVMS ISVS AND PARTNERS

HP INTEGRITY SERVERS WITH OPENVMS PROVIDE A SMOOTH TRANSITION

YARTOO SOFTWARE PTY LTD	Compiled approximately 500K lines of code, and had the core applications running in around 6 hours
Flinders Medical Center	Porting our 1.5 million lines of code to OpenVMS on Integrity required no code changes at all
ASX	500,000 lines of Pascal code, only changing 5 lines of code
ABF	OpenVMS on Integrity servers provides a stable and reliable platform for our customers' mission-critical environments
Fraport	Only modified 3% to 5% of code in migration to Integrity

QUANTITATIVE PROOF POINTS

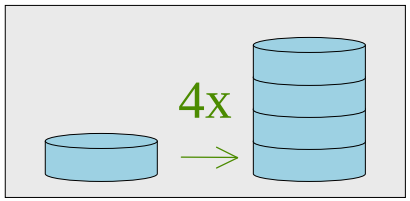
REASONS TO MOVE TO OPENVMS ON HP INTEGRITY

70%

TCO reduction by up to 70% over 3 years
- ROI payback in as little as 6 months

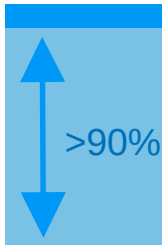
4X

Productivity gains up to 400%



>90%

Extensive ISV ecosystem – Over 90% of ISVs with OpenVMS apps have migrated to HP Integrity



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Flexible financing options on HP Integrity

OPENVMS CUSTOMER PROGRAMS AT A GLANCE

- 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
- Access to HP Technologies through Customer Lab (similar to PTAC labs)
  - Porting and Migration assistance
  - Technical Consulting
  - Privileged Technology Previews
- Connect with OpenVMS eco system
  - 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
- E-mail: OpenVMS.Programs@hp.com
- Website: http://intranet.hp.com/sites/OpenVMS/Pages/OpenVMS.aspx

OPENVMS CUSTOMER LAB

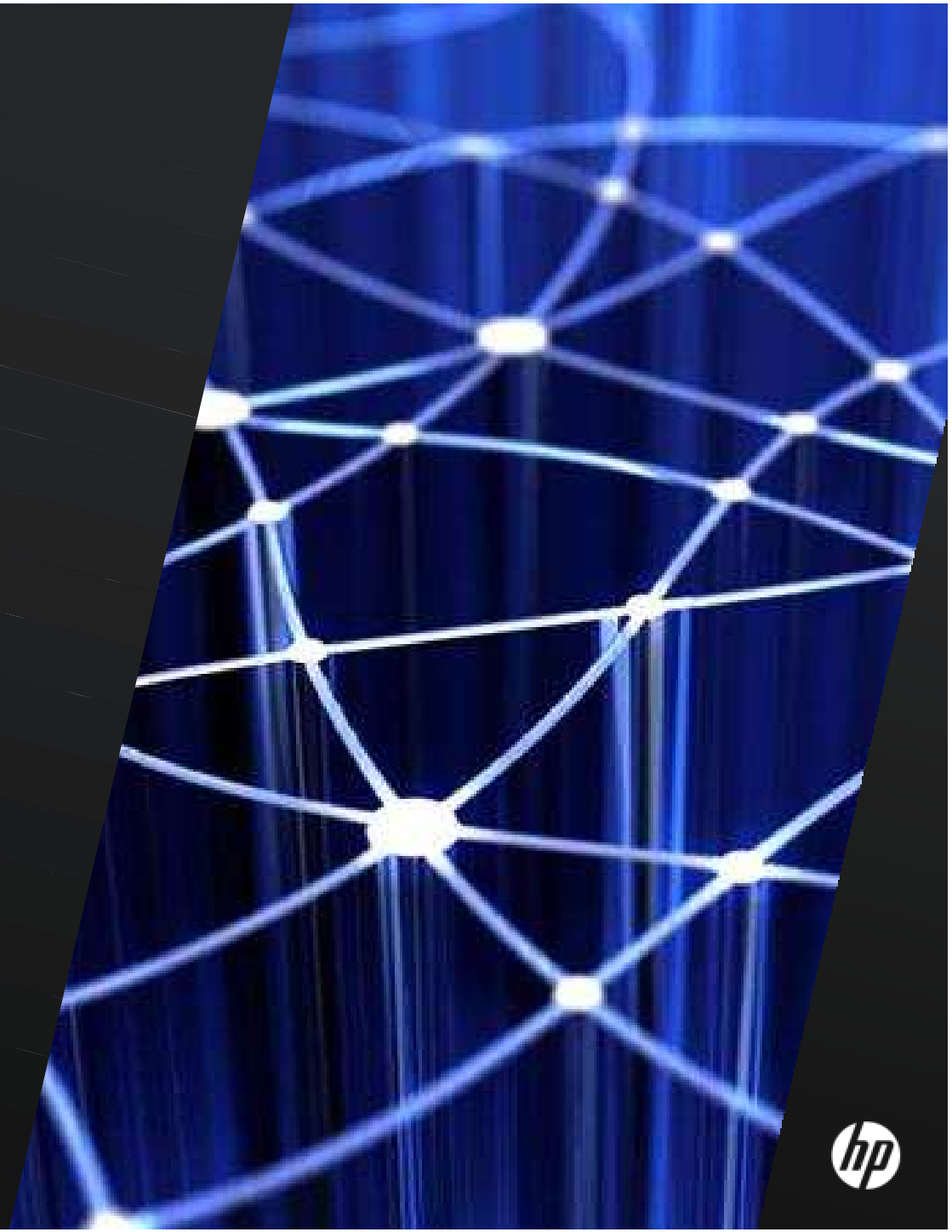
– Do you need to know exactly how fast your OpenVMS application will run on Integrity servers?
  - The OpenVMS Customer lab is the answer

– 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



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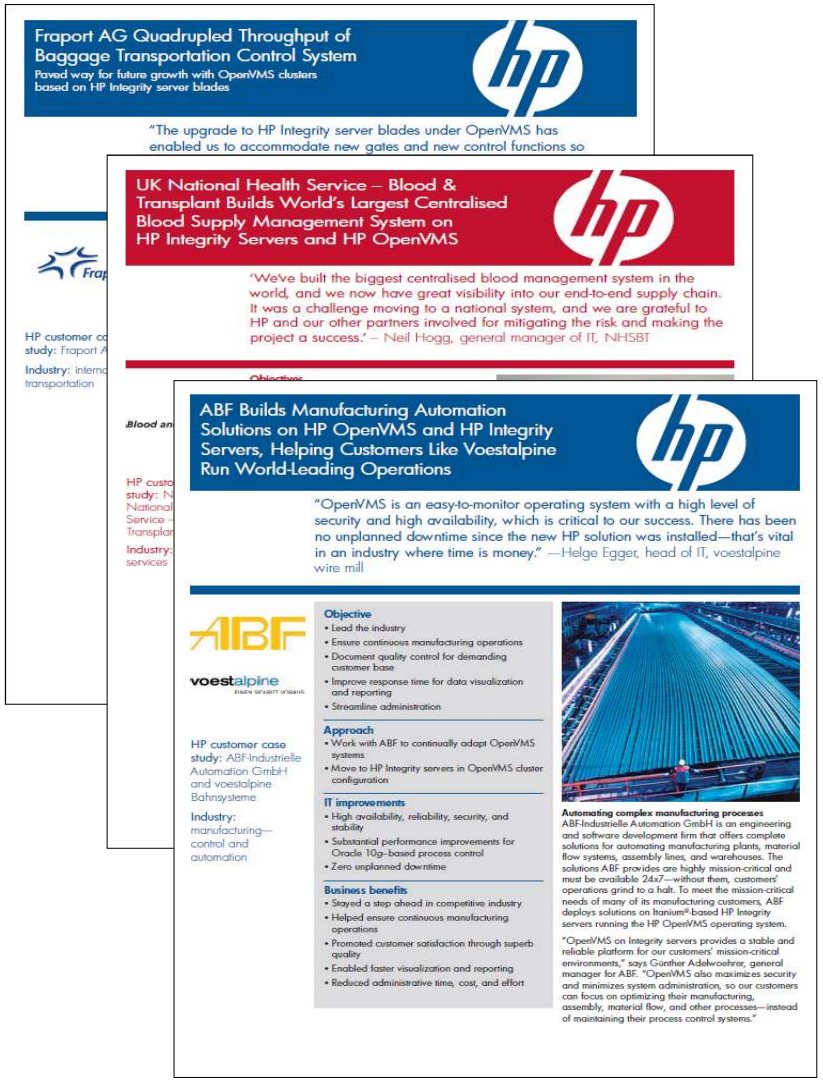
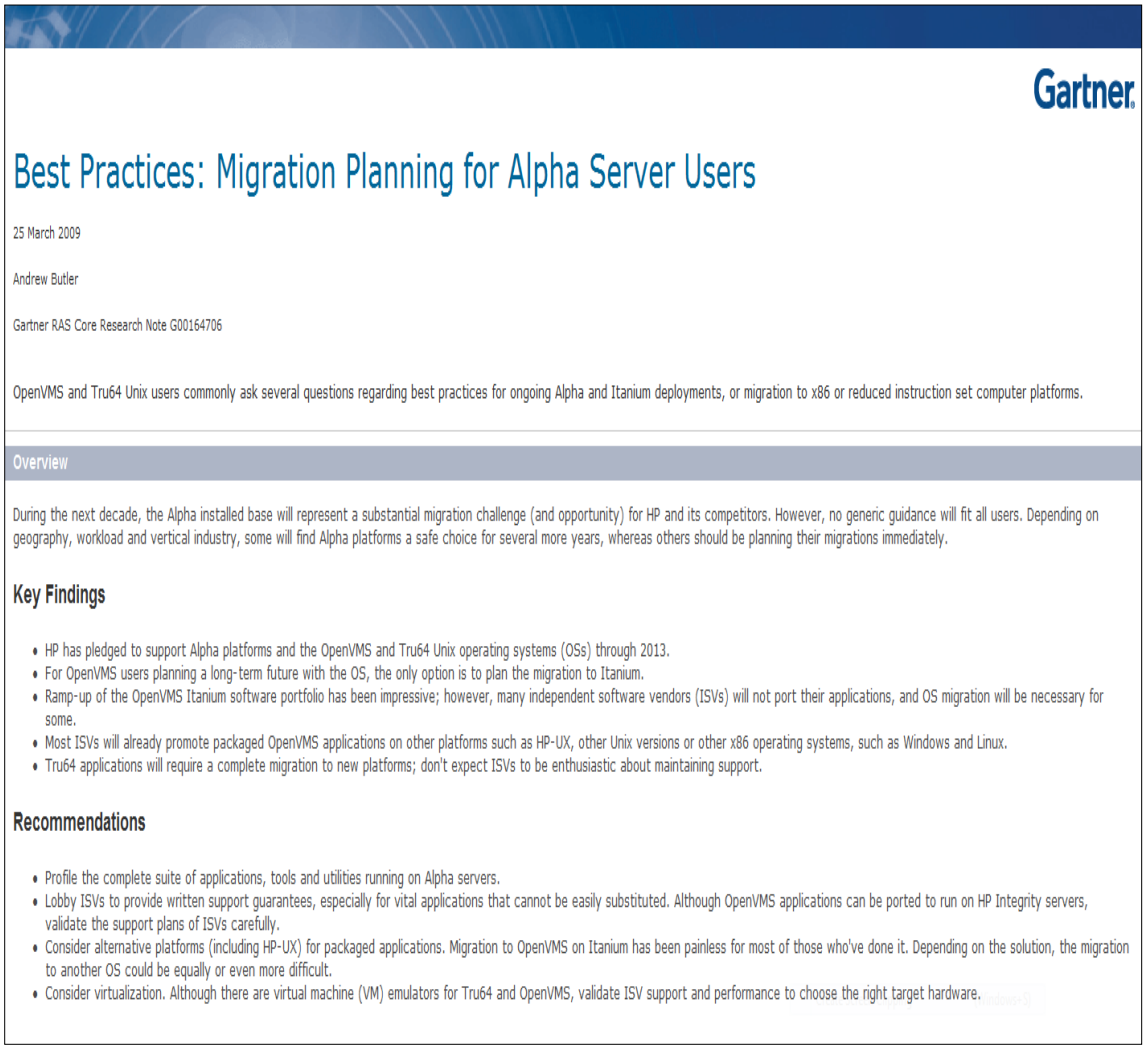


GARTNER REPORT “BEST PRACTICES: MIGRATION PLANNING FOR ALPHA SERVER USERS”



Gartner

Best Practices: Migration Planning for Alpha Server Users

25 March 2009

Andrew Butler

Gartner RAS Core Research Note G00164706

OpenVMS and Tru64 Unix users commonly ask several questions regarding best practices for ongoing Alpha and Itanium deployments, or migration to x86 or reduced instruction set computer platforms.

Overview

During the next decade, the Alpha installed base will represent a substantial migration challenge (and opportunity) for HP and its competitors. However, no generic guidance will fit all users. Depending on geography, workload and vertical industry, some will find Alpha platforms a safe choice for several more years, whereas others should be planning their migrations immediately.

Key Findings

- HP has pledged to support Alpha platforms and the OpenVMS and Tru64 Unix operating systems (OSs) through 2013.
- For OpenVMS users planning a long-term future with the OS, the only option is to plan the migration to Itanium.
- Ramp-up of the OpenVMS Itanium software portfolio has been impressive; however, many independent software vendors (ISVs) will not port their applications, and OS migration will be necessary for some.
- Most ISVs will already promote packaged OpenVMS applications on other platforms such as HP-UX, other Unix versions or other x86 operating systems, such as Windows and Linux.
- Tru64 applications will require a complete migration to new platforms; don't expect ISVs to be enthusiastic about maintaining support.

Recommendations

- Profile the complete suite of applications, tools and utilities running on Alpha servers.
- Lobby ISVs to provide written support guarantees, especially for vital applications that cannot be easily substituted. Although OpenVMS applications can be ported to run on HP Integrity servers, validate the support plans of ISVs carefully.
- Consider alternative platforms (including HP-UX) for packaged applications. Migration to OpenVMS on Itanium has been painless for most of those who've done it. Depending on the solution, the migration to another OS could be equally or even more difficult.
- Consider virtualization. Although there are virtual machine (VM) emulators for Tru64 and OpenVMS, validate ISV support and performance to choose the right target hardware.

HIGHLIGHTS FROM RECENT WORLDWIDE CUSTOMER ADVOCACY SURVEY – WE'RE ALL ABOUT OUR CUSTOMERS!

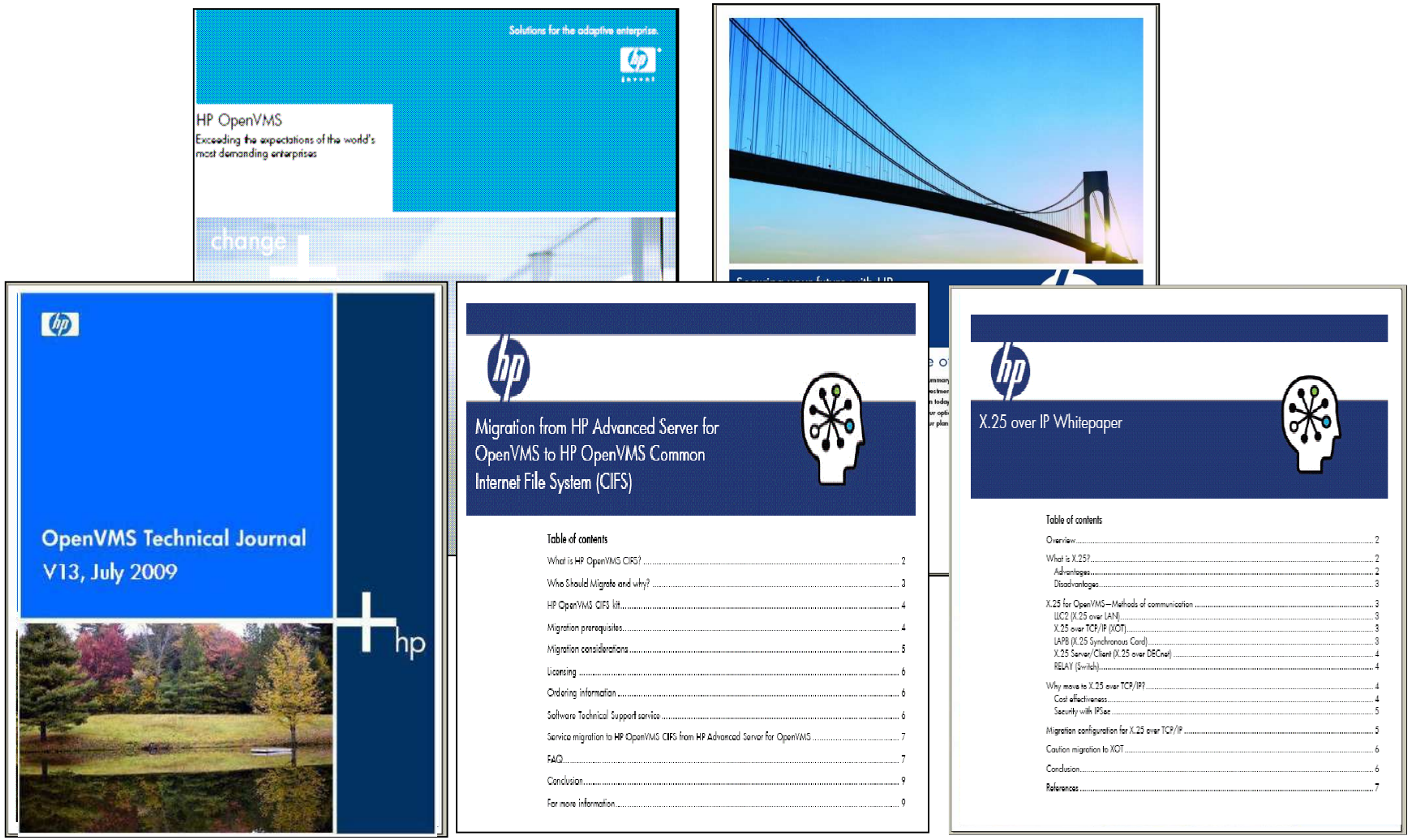
Summary for OpenVMS

OpenVMS receives a high overall satisfaction rating (9.0), Rating has remained high since 2006
Security features receive the highest satisfaction ratings, followed by software quality and reliability
Significant improvement in the satisfaction scores for ease of ordering products and timeliness of obtaining quotations.

"OpenVMS -- great technology"

"It's bullet-proof"

OPENVMS PUBLICATIONS



ROADMAP

- This roadmap is provided solely for your convenience and is updated approximately every 3 months
- While the roadmap reflects our current plans, all information in the roadmap is subject to change without notice
- HP does not warrant that we will introduce any product or feature discussed in the roadmap at any time, nor that the information is accurate

