European Technical Update Days
September/October 2007

OpenVMS Strategy and Futures

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HP OpenVMS Engineering Lab Manager

OpenVMS Strategy and Futures

- Profile
- Core Focus Areas
- Core Focus Areas and how they relate to roadmaps and operating system development
- Summary

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OpenVMS Profile and Investment Areas

The OpenVMS Mission Statement

The OpenVMS Division is committed to delivering the OpenVMS roadmaps on time and 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.

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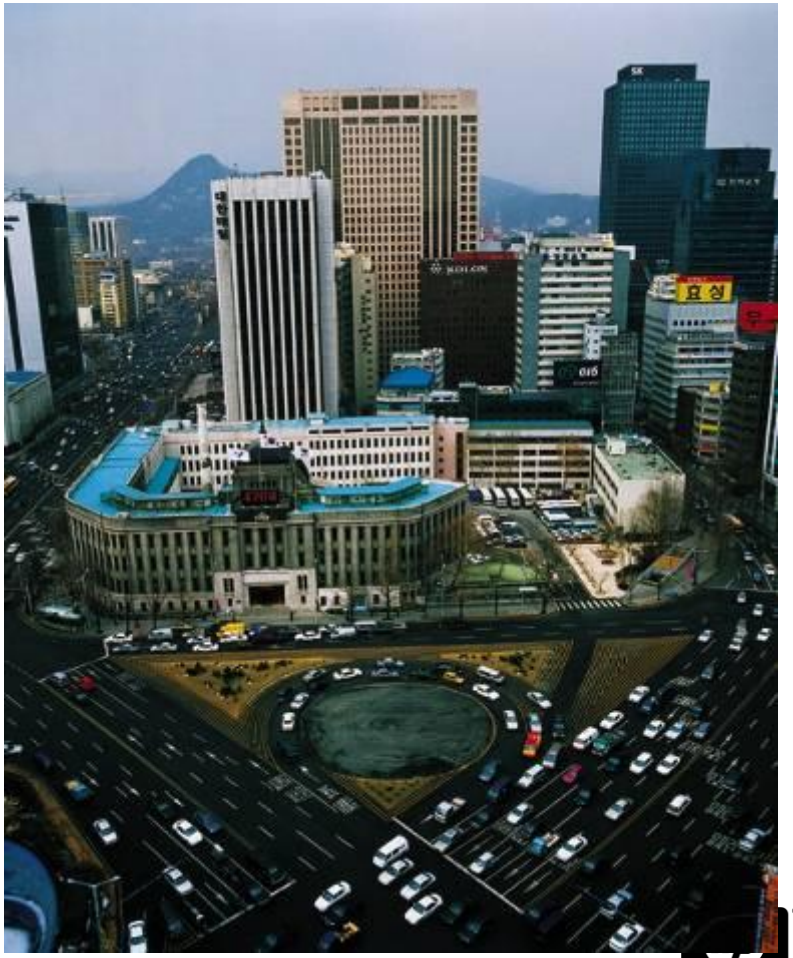
HP OpenVMS mission critical & secure computing

Hundreds of thousands systems installed with millions of users

OpenVMS provides the core IT infrastructure for:

- 1000's of major hospitals
- The world's largest CPU chip manufacturing
- Mobile phone billing systems scaling to millions of users
- Major futures and derivative exchanges worldwide
- Dominant in automated lottery systems
- Many of the world's most demanding Government environments requiring security and availability



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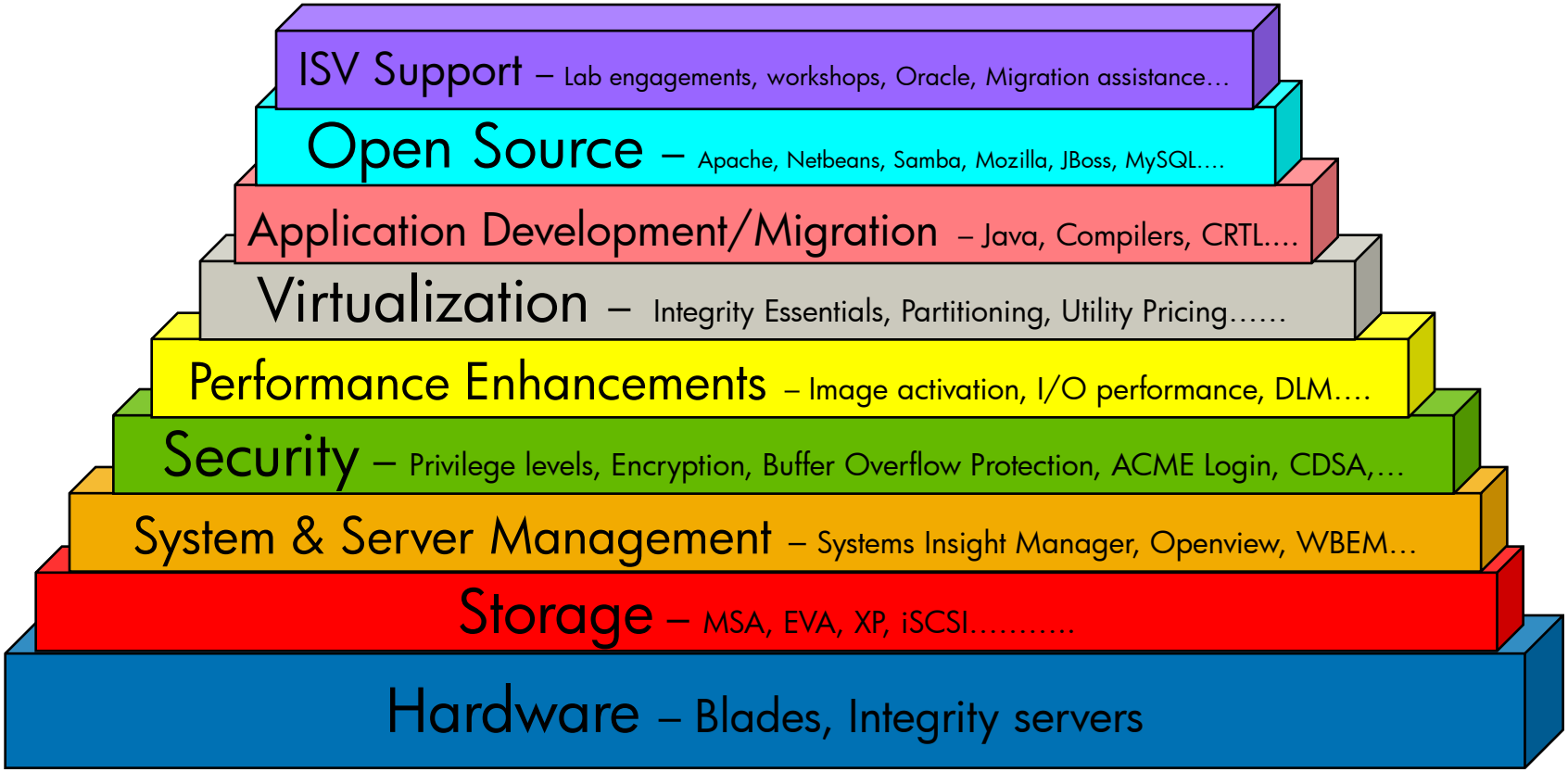
OpenVMS Core Focus Areas



The Core Pyramid

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Core Focus Areas

- What does “core focus areas” mean in regard to roadmaps, supporting and improving the OpenVMS operating system and operating environment?

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Core Focus Areas

- It means:
  - Support Integrity Server roadmap including IO technology concurrency and connection to Storage
  - Support Integrity Server features of interest to OpenVMS customers
  - Continuously improve operating system and application performance
  - Support common system/server management tools across operating systems and architectures
  - Support multi-OS virtualization technologies
  - Maintain and enhance OpenVMS attributes – security, clusters, disaster tolerance
  - Add new features as requested by customers, including Open Source solutions and industry software standards
  - Continue to engineer and test the operating system and associated products to ensure robustness and quality

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Core Focus Areas

- How have we done over the past two years in implementing the Core Focus Areas?
- What we have done, what we are doing today, what we are going to do in the future

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Recent History

- OpenVMS V8.2, Alpha/Integrity, first production Integrity release. February 2005
- OpenVMS V8.2-1, Integrity only. September 2005
- OpenVMS V8.3, Alpha/Integrity. August 2006
- OpenVMS V8.3-1H1, Integrity only. November 2007
- OpenVMS V8.4, Alpha/Integrity, late 2008 or early 2009

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HP OpenVMS Operating System Rolling Roadmap

OpenVMS V8.3
Shipping Now!
Platforms: Alpha and Integrity

New support:
- rx2660 – 2/07
- PCI Express–3/07
  - rx2660
  - rx3600
  - rx6600

HP c-Class Integrity Blade
FRS: June '07

- V8.3 based system support

OpenVMS V8.3-1H1
FRS: H2 2007
Platforms: Integrity only

- Dual-core Intel® Itanium® 2 processor upgrades
- HP c-Class Blades system management support
- New I/O options support (PCI Express)

OpenVMS V8.4
FRS: 18-24 months
Platforms: Alpha and Integrity

- New Integrity systems
- Storage performance and connectivity
- Performance & Scalability enhancements
- Industry Standards: Security, Integration software, Web Services, Java, UNIX/Linux Interoperability

- **HPVM – HP Integrity Virtual Machine**

OpenVMS V8.n
FRS: +18-24 months
Platforms: Alpha and Integrity

- New Integrity systems
- Industry standards
- Performance & Scalability enhancements
- Virtualization

Continued OpenVMS releases

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How have we implemented the Strategy

- Supported Integrity Servers from 2-16 socket, Entry Class, Mid-Range, and Superdome
- Supported McKinley, Madison, Madison9, Montecito processors
  - Montvale in V8.3-1H1
  - Planning Tukwila/new server support
- With Montecito, implemented multicore and HyperThread support
- PCIexpress, faster USB
- Increased OpenVMS CPU namespace from 0-31 (32 CPUs max) to 0-63 (64 CPU max), with infrastructure in place for 0-1023

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Implementation of Strategy, continued

- Evolved IO technology
  - Fibrechannel from 1Gbit to 2Gbit to 4Gbit, planning 8Gbit
  - SCSI from U160 to U320 and now Serial Attach SCSI, soon SAS with external shelves and low cost multihost clusters with SAS storage
  - Backplane RAID
  - Fibrechannel storage arrays – HSG/MSA/EVA/XP
  - Tapes
  - LAN technology from 10/100/1000 to 10Gbit
- iSCSI in planning

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Implementation of Strategy, continued

- Evolved IO technology – more than just basic driver support
  - LAN Failover
  - VLAN
  - Fastpath in Storage, LAN, and Cluster drivers (assign driver to CPU, take interrupts off primary CPU)
  - Removal of IOLOCK8 from Storage driver stack in V8.3-1H1
- Cluster
  - Exploit new LAN interconnects
  - Dedicate CPU to Lock Manager. Technique extended to TCP/IP
  - Satellite boot for Integrity
  - Host Based MiniMerge
  - Data compression in PEDRIVER
  - Fix PEDRIVER bandwidth limiters for 10Gbit
- Next for Clusters
  - Cluster/IP – implementation in progress
  - New low latency 10Gbit/RDMA - investigations

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Implementation of Strategy, continued

- Integrity Blades
  - Added to OpenVMS roadmap 18 months ago
  - Delivered basic hardware support on V8.3 with Base Blades kit in June 2007. Enclosure, LAN/SAN connectivity
  - Following up with V8.3-1H1 to add:
    - Provisioning via HP SIM
    - Monitoring and Indications from Blades and other servers with HP SIM and WBEM providers
    - Virtual Connect LAN and Fibre interconnects (isolate Server from SAN/LAN)
    - Storage Sidecar (extra SAS drives), Tape Blade, PCI expander Sidecar
    - vMedia (new)
    - VGA console for Blades and other Entry Class Integrity Servers
    - c3000 “Shorty” enclosure
    - Planning Blade Storage solutions, vKVM

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HP Integrity Server Future Roadmap

- Montvale processor and PCIexpress upgrades
- Following Intel Processor Roadmap

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Itanium® Processor Family

Innovation Continues...

Kittson

Poulson

Tukwila

Montvale

Dual-Core Itanium®
2 processor (Montecito)

All dates, product features and plans are subject to change without notice.

Intel® Itanium® Processor Roadmap

Every Generation: 3 Optimized Product Options	2005	2006	2007	2008	Future
Enterprise *High Performance Computing* *Low Power / High Density*	**Itanium® 2** *(Madison 9M)*	**Montecito** *Dual core*	**Montvale** *Dual core*	**Tukwila** *Multi-core*	**Poulson** *Multi-core*
Expanding Capabilities	• Large Cache • EPIC architecture • Leading Availability	• Dual-Core with Hyper-Threading Technology • Intel® Virtualization Technology • Cache reliability (Pellston)	• Demand Based Switching	• Multi-Core • Common platform architecture with Intel® Xeon™ processor MP • Enhanced Intel® Virtualization Technology • Enhanced RAS • Enhanced I/O & memory	

All products, dates, comparisons, and information are preliminary and subject to change without notice.

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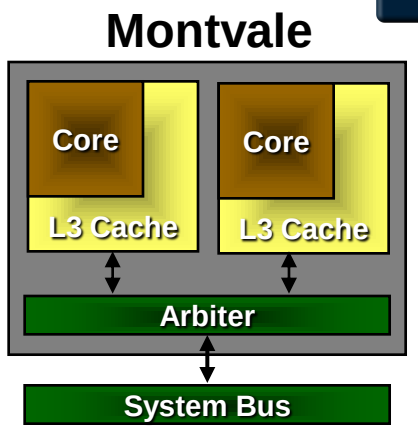
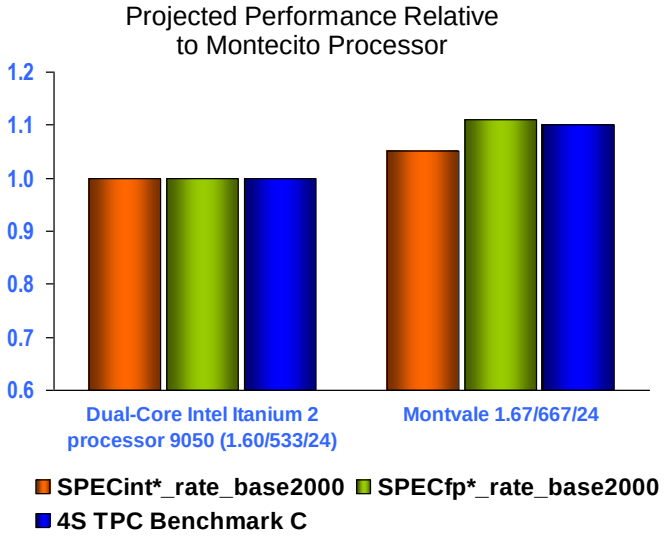
Continue Dual-Core Intel® Itanium® 2 Processor Ramp with Montvale

- **Montvale**
  - Extends Dual-Core Intel® Itanium® 2-based platform life
  - Maintains power/thermal envelope (104W)
  - Supports Dual-Core Intel Itanium 2 processor features
  - **Delivers New functionality**:
    - 667MHz → Increased bandwidth for enterprise and HPC
    - Demand Based Switching → Power management technology
    - Core-level lock-step → For Increased mission critical system reliability
- **Schedule**
  - Qual samples: Targeted Q3'07
  - Launch: Targeted Q4'07



667/533MHz
533*/400MHz



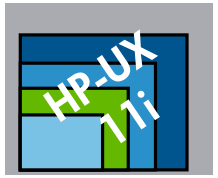
Quick transition to continue ramp

Complete HP Integrity server portfolio

Architecture

- Intel® Itanium®
- Single- or dual-core

Operating Systems



High-end

HP Integrity Superdome
(up to 128 processor cores)

Midrange

HP Integrity rx8640
(up to 32 processor cores)

HP Integrity rx7640
(up to 16 processor cores)

Modular

HP Integrity
BL860c Blade
(up to 4 cores)

Entry-class

HP Integrity
rx2660
(up to 4 cores)

HP Integrity
rx3600
(up to 4 cores)

HP Integrity
rx4640
(up to 8 cores)

HP Integrity
rx6600
(up to 8 cores)

Cellboard-based

- HP sx2000 chipset
- Electrically isolated hard partitions
- Double-chip sparing

Mainboard-based

- HP zx2 chipset
- Double-chip sparing

HP Integrity Blade Server Roadmap

# Sockets	2006	2007	2008	2009
2S	BL60p 1sFH Mad9m zx1 HP-UX 11i	BL860c 1sFH DC Montecito zx2 DDR-II, PCIe HP-UX 11i	BL860c 1sFH DC Montvale zx2 DDR-II, PCIe HP-UX 11i	BL860c G2 1sFH QC Tukwila zx3 FB DIMM, PCIe HP-UX 11i
4S			BL870c 2sFH DC Montvale zx2 DDR-II, PCIe HP-UX 11i	BL870c G2 2sFH QC Tukwila zx3 FB DIMM, PCIe HP-UX 11i

Legend:
1sFH = single slot Full Height
2sFH = two slot Full Height
DC = Dual Core
QC = Quad Core

PCI Express
DDR-II Memory
FB DIMM Memory

Timeframes not to scale

Plans subject to change

HP Integrity Server Future Roadmap

- System designs in progress for Tukwila based servers to cover entry class, mid/high end
- Tukwila
  - More cores
  - Advanced process technology
  - Integrated memory controller
  - High speed processor to processor links
- OpenVMS support
  - Socket local, cell local, remote memory support
  - vKVM and other sys/server mgmt features
  - Power management
  - RAS feature support

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OpenVMS Storage HW Roadmap

MSA Storage Family (Alpha and Integrity)
- MSA1500 Q4 2006

EVA Storage Family (Alpha and Integrity)
- EVA 4000/6000/8000 (Now Supported!)
- Enhanced EVA CA support (2007)

XP Storage Family (Alpha and Integrity)
- Support of XP12000/XP10000 (Now Supported!)
- Enhanced XP CA Support (ongoing)

HSG80 Support (Alpha and Integrity)
- Support for ACS 8.8x final firmware update
- General Storage Support

- U320 SCSI RAID (SmartArray) (Alpha and Integrity Q1 2006)
- 4gb FC (Integrity Server Only, H2 2006) (Ships with OpenVMS V8.3)
- SAS Support (New Integrity servers Only, H2 2006+)
- iSCSI (Integrity Only, Software client w/existing LAN) (8.3-1H1-based EAK)
- iSCSI with HBA hardware assist (TOE) (V8.4+)

Tape Library/Drive Support by OpenVMS (not necessarily backup applications)
- Ongoing support - MSL, ESL/eSeries (Incl. partitioning support), VLS, EML Libraries
  - Support of LTO2, LTO3, and SDLTx drives in these libraries (as appropriate)
- 1/8 Autoloader Support (direct-attach only, Alpha and Integrity)

Subject to change without notice

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OpenVMS Cluster Roadmap

V8.2-1 (Integrity Only) – Improved Cluster Support

- Full 96 node mixed Alpha/Integrity server cluster
- 2-node Shared SCSI cluster support w/MSA30MI (Multi-initiator) shelf

V8.3 – Improved Mixed-Architecture Alpha/Integrity Clusters

- Integrity Server Satellite Boot Support

Disaster Tolerant (DT)

Cluster Interconnect

- Qualify "FC to IP" bridge technology
- Share Storage and SCS traffic over single protocol path

V8.4 – Cluster Interconnect Update

- SCS Traffic over TCP/IP Protocol
- 2 node shared SAS cluster support (tbd)

New Cluster Interconnect (Post V8.4)

- Investigation of Next-generation Low-Latency Interconnect (RDMA-based) (Integrity Servers Only)

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OpenVMS LAN HW Roadmap

OpenVMS V8.3

- **Integrity Network Boot support**
- **VLAN support**
- **10 Gigabit NIC support (Integrity Servers only)**

Post OpenVMS V8.3:

- **PCI-express support:**
  - **1 Gbit NIC**
  - **10 Gbit NIC**
- **Investigate RNIC advanced features**

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Strategy, continued

- That was all about the hardware roadmap – what else?
  - Performance
  - System/Server management
  - Virtualization
  - Unix Portability and OpenSource solutions

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Performance

- Emphasis in OpenVMS V8.2 on completing port of functionality and on correctness
- Now – improving. Fixing software bottlenecks in OpenVMS based on our knowledge of areas of the OS on Integrity that are slower than Alpha and based on observation of customer workloads
- The Itanium processors are fast.
  - Faster cores
  - 128 general purpose and 128 floating point registers
  - Large caches compared to Alpha EV7

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If Performance is Important - Stay Current

- V8.2
  - IPF, Fast UCB create/delete, MONITOR, TCPIP, large lock value blocks
- V8.2-1
  - Scaling, alignment fault reductions, $SETSTK_64, Unwind data binary search
- V8.3
  - AST delivery, Scheduling, $SETSTK/$SETSTK_64, Faster Deadlock Detection, Unit Number Increases, PEDRIVER Data Compression, RMS Global Buffers in P2 Space, alignment fault reductions
- V8.3-1H1
  - Reduce IOLOCK8 usage by Fibre Channel port driver
- Some performance work does get back ported…

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Performance Summary

- The current Integrity systems perform better than existing Alpha systems in most cases
  - often buy substantial amounts and with:
    - lower acquisition costs
    - reduced floor and rack space requirements
    - reduced cooling requirements
- Significant performance improvements continue to be made to OpenVMS
    - Some improvements are Integrity specific, but others apply to Alpha

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System/Server Management

- Customer feedback – common management tools across OS, server architecture, storage (!)
- Even more important with Blades with multi-OS/architecture in same enclosure
- Major initiative in HP to get to commonality
- OpenVMS
  - OpenView
  - HP SIM with WBEM infrastructure
  - Planning additional WBEM provider support
  - Traditional OpenVMS management tools

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OpenVMS OpenView Roadmap

OpenView Operations (OVO) V7 Agent and OpenVMS SPI for OpenVMS Alpha and Integrity

OVO V8 Agent and OpenVMS SPI on Alpha and Integrity

OpenView Performance Agent 4.0 for OpenVMS Alpha and Integrity

OpenView Performance Agent 4.6 for OpenVMS Alpha and Integrity

Oracle Rdb SPI for OpenVMS Alpha and Integrity

Ongoing releases to support OpenView infrastructure

Subject to change without notice

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OpenVMS Server Management

Ongoing support and integration with HP Systems Insight Manager (SIM)

Blades System Management
- **WBEM server Integrity**
- **WBEM Providers**
- **Provisioning (silent OS install)**

Management Agents V3.3 for OpenVMS Alpha and Integrity

WBEM Developers Kit V1.0 for OpenVMS Alpha (based on Pegasus V2.5)

WBEM Developers Kit V2.0 for OpenVMS Integrity (based on Pegasus)

Ongoing releases to support WBEM infrastructure

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Tools Integrated with OpenVMS

Availability Mgr V2.6 on OpenVMS Alpha & Integrity

Availability Mgr V3.0 on OpenVMS Alpha & Integrity

Availability Mgr V3.1 on OpenVMS Alpha & Integrity

Management Station V3.2D on OpenVMS Alpha and Integrity

ECP Performance Analyzer V5.5a for OpenVMS Alpha
uses TDC 2.1

ECP Performance Analyzer V5.6 for OpenVMS Alpha
uses TDC 2.2 and later

Ongoing support and maintenance of integrated tools

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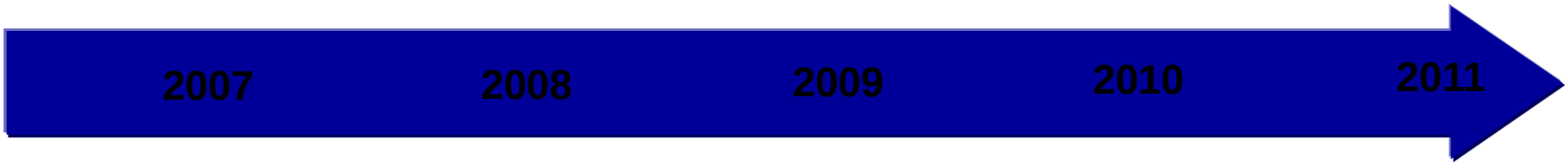
Tools Integrated with OpenVMS



Performance Data Collector (TDC) V2.2 for OpenVMS Alpha and Integrity

TDC V2.3 for Alpha and Integrity

TDC V2.4 for Alpha and Integrity

Graphical Configuration Manager (GCM) V1.1 for OpenVMS Alpha

Subject to change without notice

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Virtualization

- What does Virtualization mean
  - VMware
  - XEN
  - HP Integrity Virtual Machine
  - Storage virtualization
  - Server consolidation
  - Workload management - ability to maximize use of physical resources
  - iCAP, TiCAP, GiCAP, Pay Per Use
  - ?

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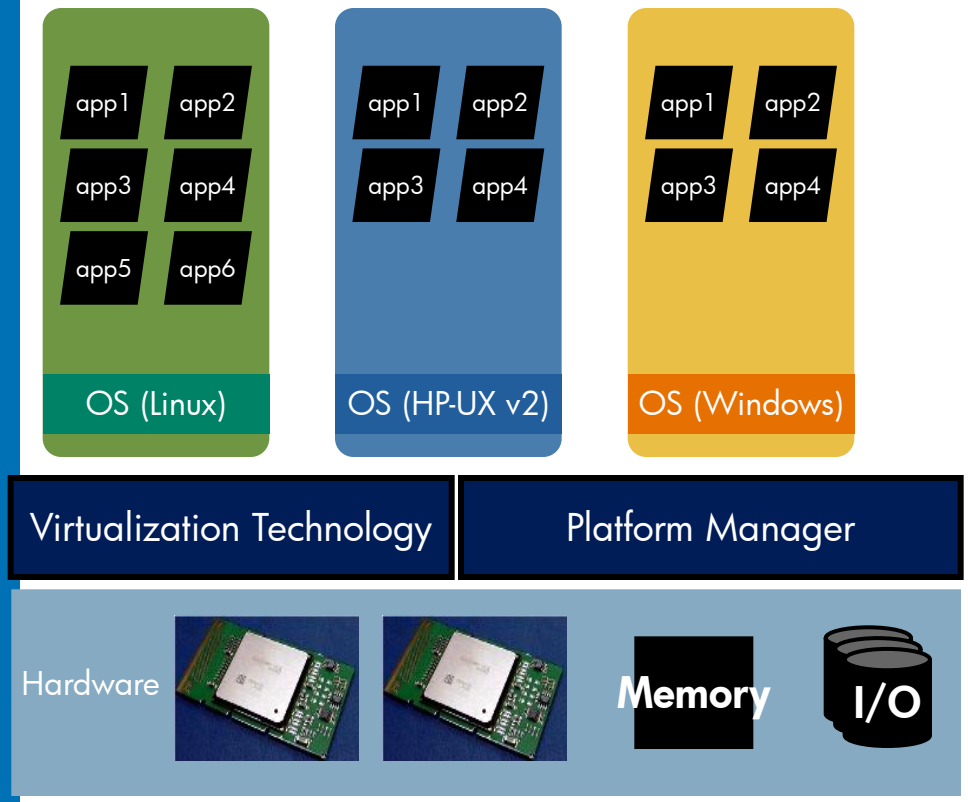
HPVM Overview



- Customer value – improved asset utilization - across OSs + reduced total cost of ownership
- Partitioning into multiple virtual machines – more partitions than CPUs, fully virtualized CPU, I/O, and memory
- Fine grained partitioning & sharing - sub-CPU granularity, I/O device sharing and memory sharing
- Dynamic resource allocation – CPU oversubscription, resource limits, dynamic CPU and I/O movement
- Isolation - provides OS fault and security isolation
- Hardware independence – supports all HP Integrity servers
- Multi-OS support – runs un-modified HP-UX, Windows (late 2006), Linux (Q207) and OpenVMS (planned)

Consolidation and Automatic Load Balancing across multiple systems

Load Broker, Metric Server, gWLM and iCAP

- Load Broker - available with TCP-IP Services - is able to move jobs between systems based on CPU/system loading information from Metric Server - also with TCP-IP Services - thereby balancing the loads
  - http://h71000.www7.hp.com/doc/732final/6526/6526pro_017.html#lbroker_over

- For further load refining, gWLM is able to reallocate/migrate iCAP CPUs between partitions within each system. gWLM will give highest priority to business critical applications/hard partitions and jobs with defined Service Level Agreements (SLAs)

- If the combined loads exceed current active CPU capabilities, the System Manager can instantly turn on iCAP CPUs with a TiCAP license – automated with gWLM V2.5

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HP OpenVMS Virtualization
HP VSE for OpenVMS

HP Virtual Server Environment (VSE)

Control
- ✓ Class Scheduler
- ✓ gWLM/CMS
- ✓ Systems Insight Manager
- ✓ Load Broker & Metric Server

Availability
- ✓ Mixed Integrity & Alpha Clusters to 96 nodes
- ✓ Disaster Tolerant Clusters, extends to 800 Km
- ✓ Volume Shadowing
- ✓ Availability Manager

Partitioning
- ✓ nPars (Hard Partitioning)
- ✓ vPars/Galaxy (Alpha Soft Partitioning)
- ✓ Partition Management SW

Utility Pricing
- ✓ iCAP and TiCAP for Integrity
- ✓ PPU – *Active CPU* and *Percent CPU* for Integrity
- ✓ Pay Per Forecast

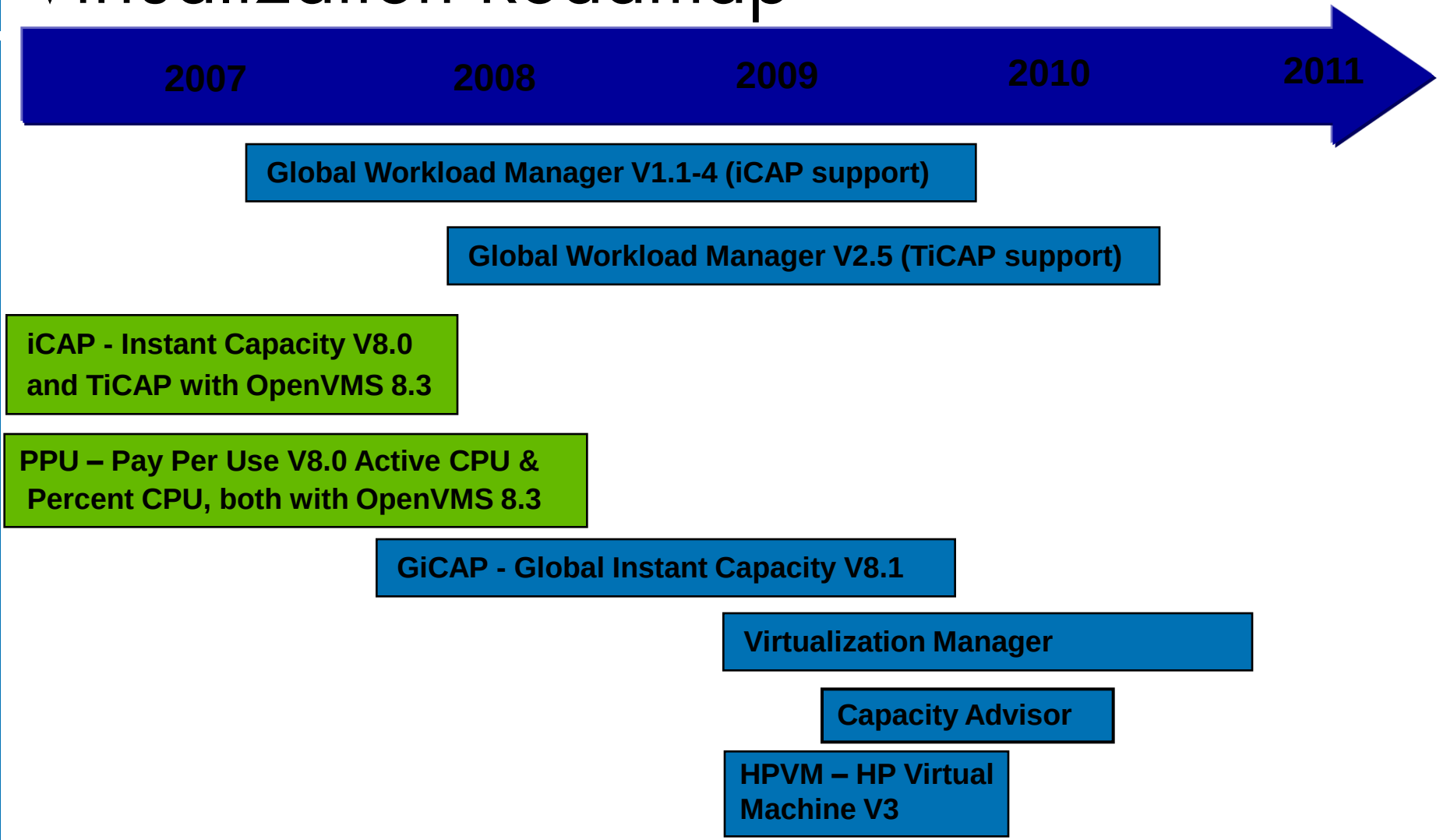
Future Directions

- ✓ Virtualization Manager
- ✓ Capacity Advisor

Future Directions

- ✓ Global iCAP - GiCAP

OpenVMS *Virtual Server Environment* Virtualization Roadmap



All implementations Integrity only unless otherwise specified

Subject to change without notice

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Unix Portability and Open Source Solutions

- Many customers want Open Source solutions to save money and to have additional solution options (not tied to proprietary vendor solutions)
- ISVs want OS features for ease of porting their product onto a target OS
- OpenVMS wants OS features for ease of porting OpenSource and other products onto OpenVMS!
- What we are doing
  - Updating the base operating system, file system, and CRTL with Unix interfaces
  - Evaluating Open Source products for support on OpenVMS

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Unix Portability Features in OpenVMS

- Goal - OpenVMS will be like any other "UNIX flavor" for easy application portability
  - OpenVMS V8.2, V8.2-1, V8.3
    - 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
    - Symlinks
    - Posix Style Pathnames
  - Planning
    - GNV updates
    - Shared Write for Stream Files
    - Semaphores and Shared Memory APIs

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UNIX Portability Roadmap

OpenVMS V8.3
- Symbolic Links
- POSIX style pathnames
- Byte range locking
- Encryption routines
- GNV update

OpenVMS V8.4
- Symlinks Logical Name support
- Semaphores
- Shared write for stream files (SSIO)
- ioctl()
- GNV update
- Shared memory APIs

POSIX LNM Pathname SDK
- Support for OpenVMS 8.2-1 and 8.3
- GNV update

Subject to change without notice

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Open Source Solutions on OpenVMS

- Supported today and going forward with new versions
  - Secure Web Server and Browser with plugins (see roadmap)
  - Web Services Toolkit
  - NetBeans
  - Samba
  - SSL
  - Kerberos
  - Stunnel
- Investigating – MySQL, JBOSS, AMQP

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OpenVMS eBusiness and Integration Technologies

Secure Web Server V2.1-1 (Apache 2.0.x based) on OpenVMS Alpha and Integrity

Tomcat (JSP) 5.5.9

PHP 4.3.10

mod_perl 2.0 and Perl 5.8.6

Secure Web Browser V1.7-13 on OpenVMS Alpha and Integrity

SWS and SWB updates on Alpha and Integrity tracking the associated open source project

Secure Web Browser based on Firefox and Thunderbird

BridgeWorks V3.0A on OpenVMS Alpha

COM V1.4 on OpenVMS Alpha

OPC Transport for OpenVMS Integrity

DCE V3.2 for OpenVMS Alpha and Integrity

Subject to change without notice

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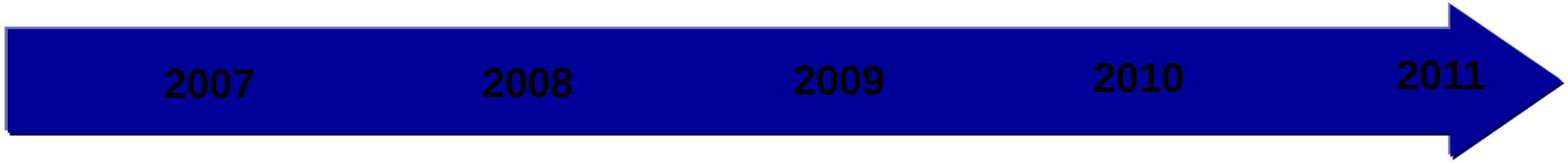
OpenVMS eBusiness and Integration Technologies



Java™ Platform, Standard Edition, v 1.4.2, for OpenVMS Alpha and Integrity

Java SE 5.0 on OpenVMS Alpha

Java SE 5.x updates on Alpha

Java SE 5.0 on OpenVMS Integrity

Java SE 6.0 on OpenVMS Integrity

Native JDBC/ODBC (via Attunity Connect)

Java SE updates on Integrity

Web Services Tools (XML, SOAP, WSDL, UDDI)

XML Technology on OpenVMS Integrity

SOAP Toolkit on OpenVMS Integrity

UDDI Client Toolkit (UDDI4J) on Alpha and Integrity

Web Services Tools updates on OpenVMS Alpha and Integrity

Web Services Integration Toolkit (WSIT) 1.2 for OpenVMS Alpha and Integrity

Subject to change without notice

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Summary

OpenVMS Strategy Summary

- HP's Adaptive Enterprise brings many exciting new technologies to OpenVMS
  - Integrity Servers, Blades technology, Virtualization, Utility Pricing, OpenView, Global Workload Mgr, Virtual Machine
- OpenVMS continues to meet its roadmap commitments on time
  - Blades support available soon
  - V8.3-1H1 available later in the year
- Integrity migration now gathering momentum, many customers have already moved or are moving this year
- HP will help customers as they integrate these new technologies into their IT environment

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More Roadmaps / Other information

- Backup

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TCP/IP Services for OpenVMS

TCP/IP V5.6 H2 2006 - Alpha & Integrity for OVMS V8.3

- DNS /BIND 9 Resolver & V9.3 Server
- NFS enhancements
- FTP performance improvements
- Security modifications
  - DNS security extensions
  - NTP sec update (SSL)
  - SSH upgrade w/Kerberos
- Mail improvements
- TELNET Server Device limit
- IPV6 support – LPD & TELNETSYM
- TCPIP$CONFIG (failSAFE) update
- Improved Mgt Utilities (ifconfig)

TCP/IP support of V8.3-1H1 & V8.4

- *Continued focus on* Networking enhancements to support interoperability, connectivity, discovery, and security
- IPSec
- Clusters over TCP/IP
- Packet Processing Engine
- NFS enhancements
- FTP enhancements
- LPD port configurability
- V5.7 planned for H2 2008

IPsec EAK available post OpenVMS V8.3 & TCP/IP V5.6 - H2 2007

Subject to change without notice

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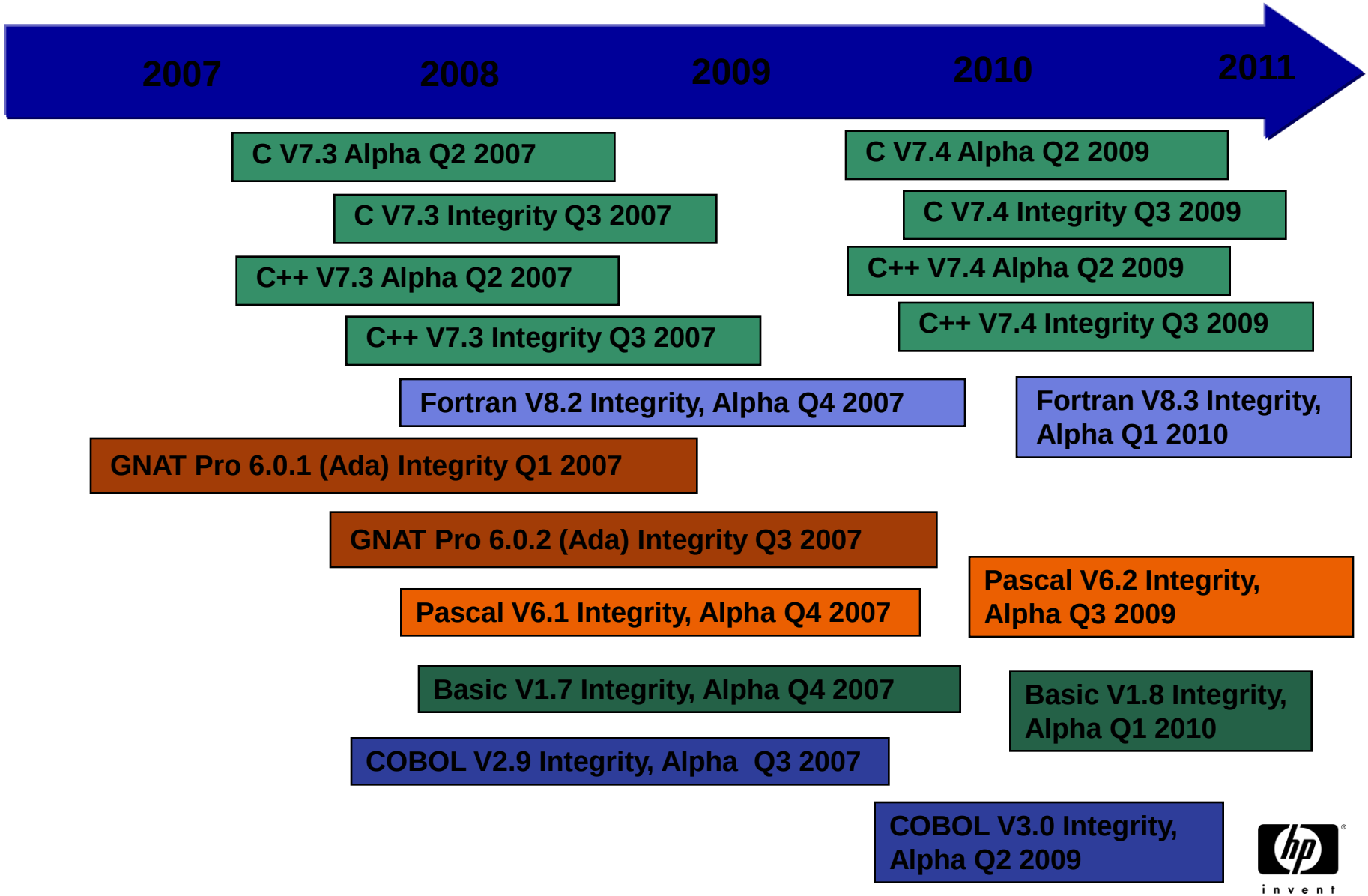
Application Development - OpenVMS Compilers



Application Development and Deployment – Tools

Distributed NetBeans V1.1-1 on Alpha and Integrity (based on NetBeans 3.6)

Distributed NetBeans V5 on Alpha and Integrity (based on NetBeans 5.x)

Ongoing Tool Releases

DECset V12.8 on Alpha and Integrity Q2 2007

DECset V12.9 on Alpha and Integrity Q2 2009

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OpenVMS Unified Messaging and Directory Roadmap

- **CommuniGate Pro - Unified Messaging and Voice over IP *SIP* Server (CommuniGate Systems)**
  OpenVMS Integrity and AlphaServer
  The endorsed replacement for ALL-IN-1, Office Server, TeamLinks, MAPI Driver, Web Interface

- **Enterprise Directory V5.4 on OpenVMS 8.2 Foundation Operating Environment for Integrity and OpenVMS 8.2 AlphaServer**

- **Enterprise Directory V5.5 on OpenVMS 8.3 Foundation Operating Environment for Integrity**

Subject to change without notice

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ISV Update and Integrity Adoption

OpenVMS ISV porting status

Sampling of OpenVMS Vertical ISVs – available on Integrity servers

Finance

FIRCOSOFT STP INTELLIGENCE
AFTECH
Deutsche Börse Systems
ROLFE & NOLAN
Wall Street Systems
CMX
SPOKANE COMPUTER INCORPORATED
SANCHEZ

Healthcare

TECH-TIME
IDX
NETRICS
SIEMENS

Public Sector

sct
KC KAYCEE SOFTWARE, INC.

NORTHROP GRUMMAN
KEWILL Trade Point

Manufacturing / Utilities

BROOKS AUTOMATION
Survalent Technology
ROSS SYSTEMS
ABB
CEI INC. The Solutions Provider
CINCOM
Vista Control Systems

Telco

Martin Group The One Source
logicaCMG
airwide solutions
TELUS international
TRIUMF
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Providing assistance with OpenVMS HP Integrity server transition

- HP Developer's Forums
  - 2 in 2007 – Huntington Beach, CA (March) and New Jersey (June)
  - Languages: C, C++, Fortran, COBOL, BASIC, Pascal, Macro32, Java, Bliss, DCL, Dibol
  - Some solutions ported from VAX directly to Integrity
- Customer Porting Workshops in Nashua
- Consulting Expertise Center - jointly staffed with HP and Intel experts
- Worldwide Porting Centers - for validating ISV and custom applications on Integrity servers
- Comprehensive portfolio of white papers with "how to" transitioning information

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OpenVMS Education and Hobbyist Programs

Education Program

- Three different Edu Options for Education Institutions
- 172 Different Education Establishments are involved
- 13 Countries (Austria, Belgium, Brazil, Canada, China, France, Germany, Poland, Russia, Slovenia, Switzerland, UK, USA)

Hobbyist Program

- In place since DECUS Cincinnati May 1997
- 1667 Hobbyists over the past year
- 1 Million Paks Generated to date
- Over 12,000 in the last 12 months

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