



HP Business Critical Server Product Strategic Directions and Roadmap

26 April 2004

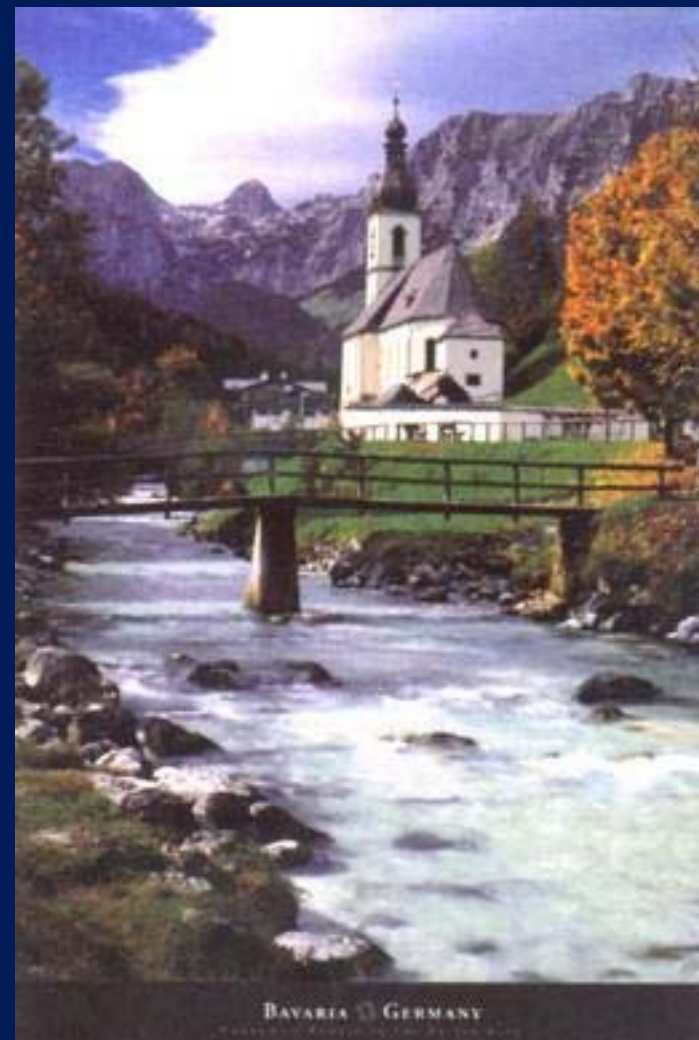
Donald Jenkins
Vice President, Marketing
Business Critical Servers, HP



Agenda



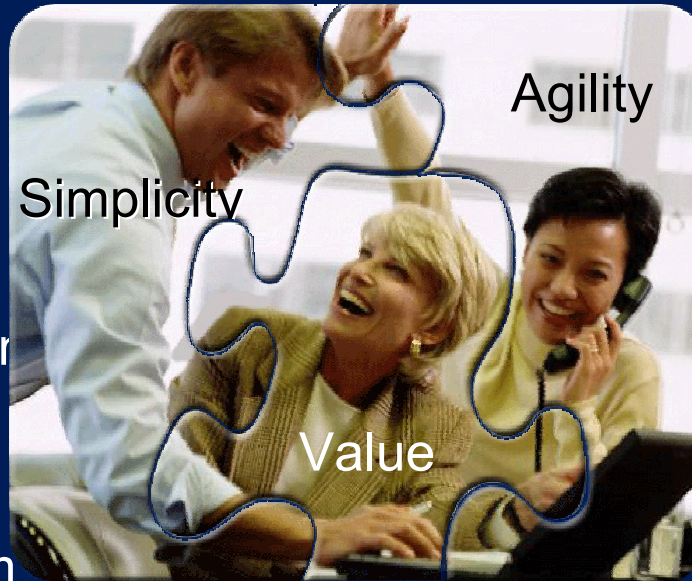
- BCS product strategy and investment priorities
- BCS server directions
- Strategic focus for HP-UX 11i, Linux, Windows and OpenVMS



BCS product strategy and priorities

Integrity Servers—leading industry standard servers for mission-critical environments

- Investment protection
- Performance and scalability
- Complete ecosystem



HP 9000—leading mission-critical server family

- Aggressive product strategy
- New HP PA8800 and PA8900 systems

Multi-OS offerings—Deliver mission-critical software value

- HP-UX 11i
- Windows
- Linux
- OpenVMS

Continued investment in AlphaServer systems

- Complete roadmap
- Customer investment

What's new!

- Availability of full-line of HP Integrity servers moves Itanium®-based systems into the mainstream, backed by more than 1,500 applications, including from major ISVs
 - HP-UX 11i v2 full enterprise-class release shipping
 - OpenVMS V8.1 Evaluation Release for HP Integrity servers available
- New line of PA-8800 based HP 9000 servers available
- Over 100 customers have previewed TruCluster technology and AdvFS on HP-UX 11i
- Alpha RetainTrust program sets the standard for providing unprecedented customer commitment
- World-leading Windows/SQL performance achieved on HP Integrity servers
- HP and Oracle first to set two processing world records
tpmC barrier



HP Integrity servers: World's fastest transaction performance and best price/performance



Record result

Leading cluster price performance

3 of the
top 4
results

Top Oracle
database
result

Top Microsoft
Windows
Server 2003
result

Top Ten TPC-C by Performance - Microsoft Internet Explorer provided by Hewlett-Packard

Address: http://www.tpc.org/tpcc/results/tpcc_perf_results.asp





TPC Transaction Processing Performance Council

The TPC defines transaction processing and database benchmarks and delivers trusted results to the industry.

Top Ten TPC-C by Performance
Version 5 Results As of 25-Feb-2004 6:53 PM [GMT]

Note 1: The TPC believes it is not valid to compare prices or price/performance of results in different currencies.

☒ All Results ☐ Clustered Results ☐ Non-Clustered Results Currency: All

Rank	Company	System	tpc-C	Price/tmC	System Availability	Database	Operating System	TP Monitor	Date Submitted	Cluster
1		HP Integrity rx5670 Cluster 64P	1,184,893	5.52 US \$	04/30/04	Oracle Database 10g Enterprise Edition	Red Hat Enterprise Linux AS 3	BEA Tuxedo 8.1	12/08/03	Y
2		IBM eServer pSeries 690 Model 7040-681	1,025,486	5.43 US \$	08/16/04	IBM DB2 UDB 8.1	IBM AIX 5L V5.2	Microsoft COM+	02/17/04	N
3		HP Integrity Superdome	1,008,144	8.33 US \$	04/14/04	Oracle Database 10g Enterprise Edition	HP UX 11.1v2 64-Bit Base OS	BEA Tuxedo 8.0	11/04/03	N
4		HP Integrity Superdome	786,646	6.49 US \$	10/23/03	Microsoft SQL Server 2000 Enterprise Ed. 64-bit	Microsoft Windows Server 2003 Datacenter Edition 64-bit	Microsoft COM+	08/27/03	N

BCS industry standards-based server strategy



Current

HP NonStop
(Mips)

HP Integrity
(Itanium)

HP 9000 /
e3000
(PA-RISC)

HP AlphaServer
(Alpha)

HP ProLiant
(X86)

Enabling larger
investment in
value-add
innovation

Future

Industry standard

HP NonStop
(Itanium based)

Common
Technologies

HP Integrity
(Itanium
based)

- Management
- Virtualization
- HA

HP ProLiant
(x86 based)

- Storage
- Clustering

Moving to 3 leadership product lines –
built on 2 industry standard architectures

BCS customer programs

Customer outreach programs

- 1x1 Customer Relationships
- Customer Advisory Forums
- User groups
- Corporate resource access

Customer Newsletters

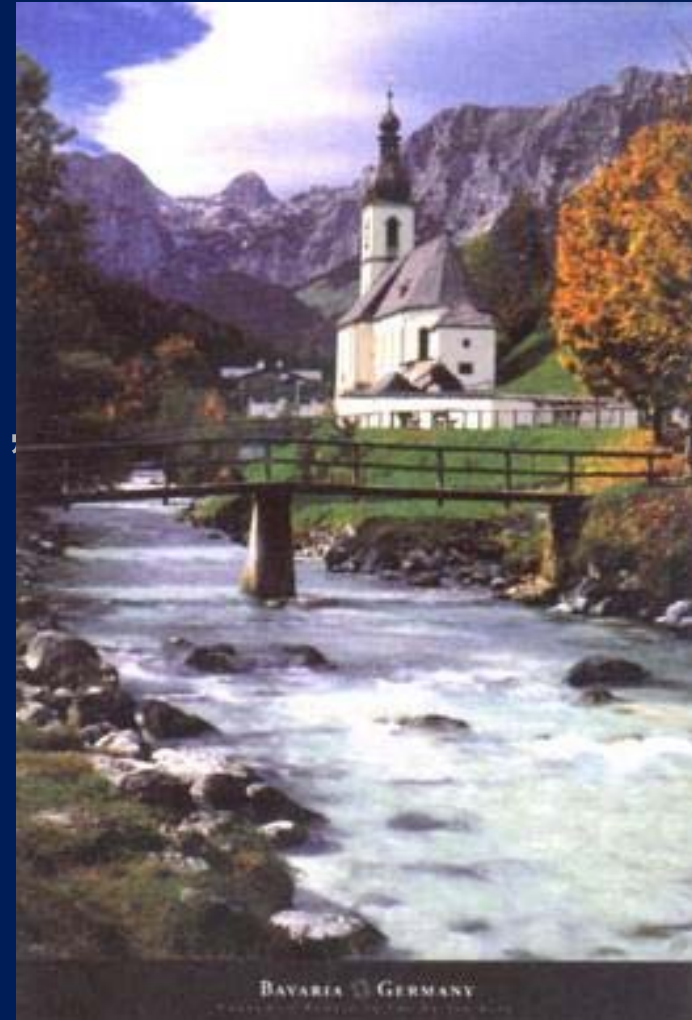
Customer evolution programs

- e3000
- Alpha RetainTrust
- HP 9000



Agenda

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Responding to customer demand






HP will support new generations of Itanium® and IA-32 processors

- ProLiant gets stronger
 - IA-32 extensions improves performance for memory bound applications
 - Integrity is HP's strategic platform for 64-bit enterprise computing
 - Performance, scalability and reliability of Integrity servers delivers unique value for mission critical applications
 - Positioning of Integrity and ProLiant servers remains the same
 - Full ecosystem including seamless support
 - Unprecedented investment protection
- The HP industry standard server family leads the industry**

HP Integrity and HP 9000 Server roadmap



Revision 3.1 Mar-04

Current offering		2004	2005	2006
 4-128P	HP 9000 Superdome		PA-8900 (dual-CPU)	New Chipset
	HP Integrity Superdome	mx2 dual processor module Itanium2 9M	Itanium2 "Montecito" New Chipset	
 2-32P	HP 9000		PA-8900 (dual-CPU)	New Chipset PA-8900
	HP Integrity	mx2 dual processor module Itanium2 9M	Itanium2 "Montecito" New Chipset	
 1-8P	HP 9000		PA-8900 (dual-CPU)	
	HP Integrity	mx2 dual processor module*	Itanium2 "Montecito"	New 8p Server and Chipset Itanium2 "Montecito"
 1-4P	HP 9000	Itanium2 9M	PA-8900 (dual-CPU)	New 4p Server and Chipset Itanium2 "Montecito"
	HP Integrity		Itanium2 "Montecito"	
 1-2P	HP Integrity		Low voltage Itanium2 (+)	Next Gen Low voltage Itanium2

Timeframes not to scale
4/18/2004

Plans subject to change

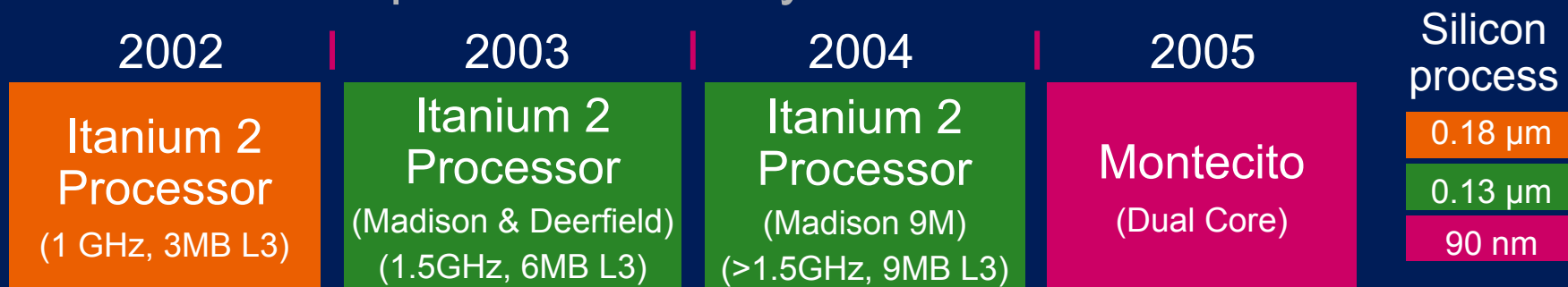
All upgrades "in-box" except as noted

*Not available at initial processor release

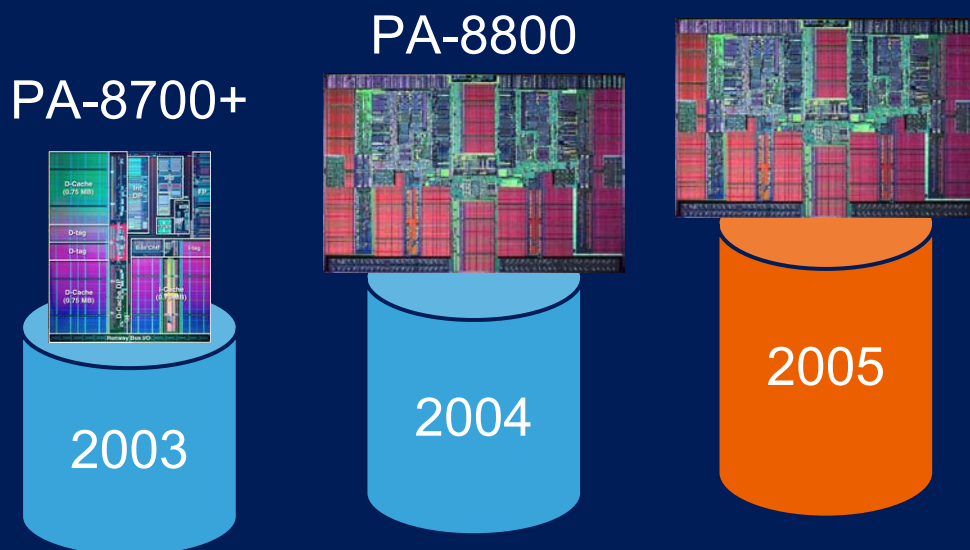
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Chip roadmaps

Intel® Itanium® processor family



PA-RISC family



In 2005, the **PA-8900** will cap the long, successful line of PA-RISC processors. PA-8900

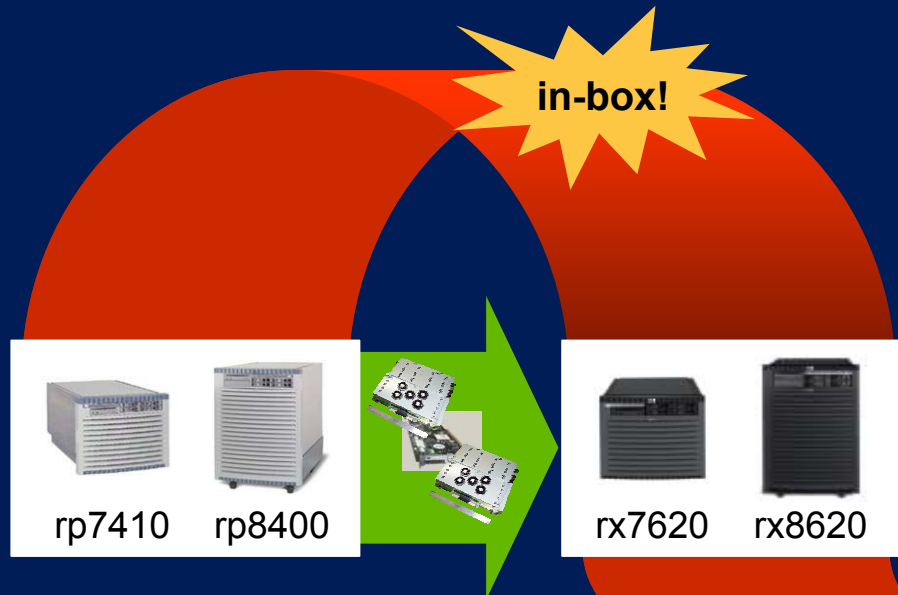
will have several enhancements over PA-8800:

- Faster clock frequency
- Larger L2 cache
- Greater performance

Future proof of HP 9000 customers IT investment



- In-box upgrades
- Evolution programs
- OS compatibility
 - HP-UX 11i data, source, and binary compatibilities
 - Linux binary compatibility
 - Intel execution layer



IBM and Sun's approach – Forced hardware upgrades to keep up with technology

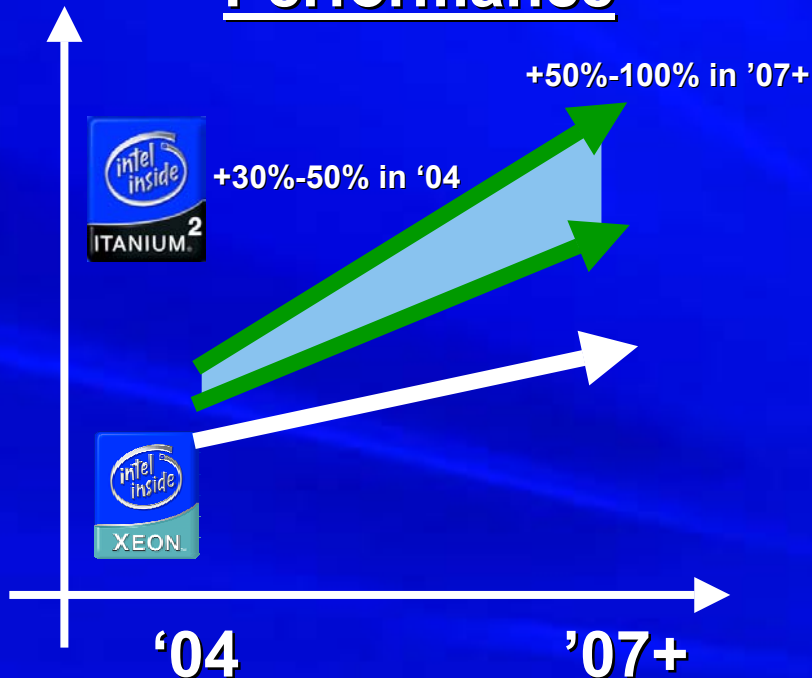
Itanium® Processor Plans

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

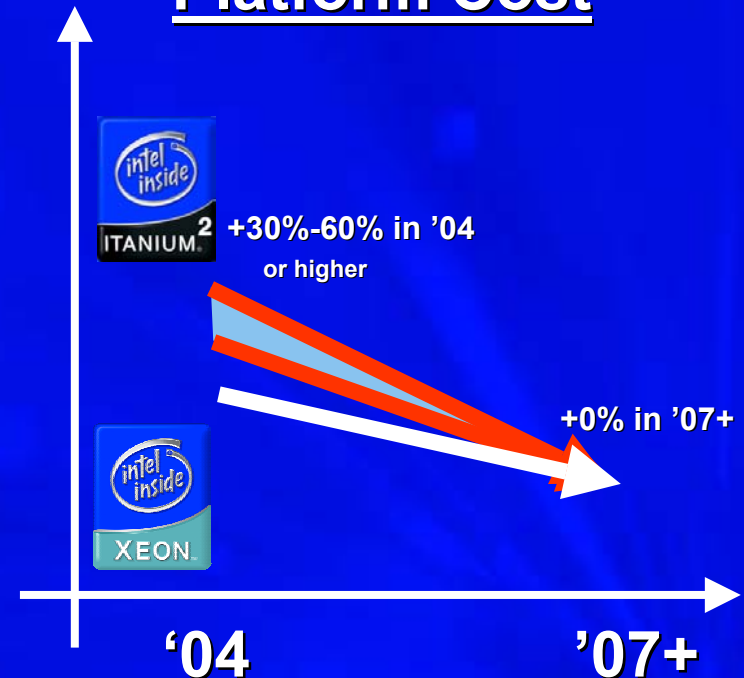
On track to deliver 1.5-2X better performance than Xeon processor

...plus cost parity with Xeon processor based platforms (via common platform infrastructure)

Performance



Platform Cost



Source : www.ioncomputers.com, www.dell.com

ION SR4004, (4) Xeon processors 2.8 GHz, 2MB cache, 24 GB system memory, 36 GB HDD, no OS - \$34,616

ION I2X4, (4) Itanium 2 processors 1.5 GHz, 6 MB cache, 24 GB system memory, 36 GB HDD, no OS - \$44, 950

Dell PowerEdge 2650, (2) Xeon processors 3.2 GHz, 1 MB cache, 4 GB system memory, 36 GB HDD, no OS - \$6,143

Dell PowerEdge 3250, (2) Itanium 2 processors 1.4 GHz, 1.5 MB cache, 4 GB system memory, 36 GB HDD, no OS - \$9,499



* Other names and brands may be claimed as the property of others.

Enterprise Platforms Group





HP innovation with new mx2 dual-processor module

Taking Integrity servers to new
levels

Donald Jenkins
Vice President, Marketing
Business Critical Servers, HP

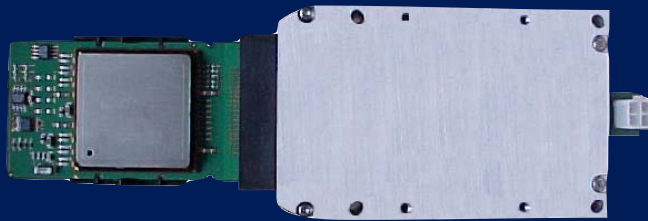


HP innovation: new mx2 dual-processor module for Integrity Servers

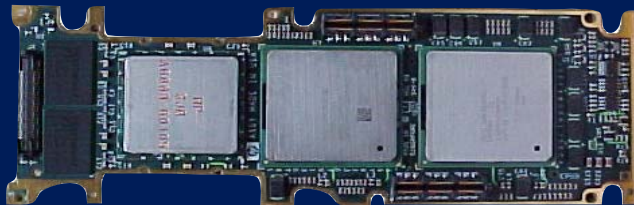


Enables two CPUs to utilize the same socket as a standard Itanium 2 processor

Intel
Itanium
2 6m
process
or



HP mx2
Module



Key Features of mx2:

- Two Itanium 2 Processors
- Each CPU has its own L1 caches
- Very large 32MB, unified L4 cache
- OS Binary compatibility with single Itanium 2 processors (Utilizes same binaries)
- Fully compatible with zx1 and sx1000 chipsets (available as in-box upgrade)

Fulfilling the vision for industry-standard servers



HP Integrity

May '04



HP Integrity Superdome
up to 128 processors

Itanium 2 6M
Processor
mx2 Processor
Module

Nov '03



XC6000
HPTC cluster

May '04



HP Integrity
rx7620-16
(16-way)

Itanium 2 6M
Processor
mx2 Processor
Module



HP Integrity
rx8620-32
(32-way)

Itanium 2 6M
Processor
mx2 Processor
Module

Feb '04

Jun '03

Oct '03

Itanium 2 6M Processor



HP Integrity
rx1600-2
(2-way)



HP Integrity
rx2600-2
(2-way)



HP Integrity
rx5670-4
(4-way)



cx2600 (2-way)
carrier grade



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

HP NonStop

2004

Intel®
Itanium®
architecture



NonStop Advanced
Architecture

May '04

Itanium 2 6M
Processor
mx2 Processor
Module

HP ProLiant

Dec '03

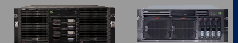


XC3000
HPTC cluster

Feb '04



HP ProLiant
ML line



HP
ProLiant
BL line

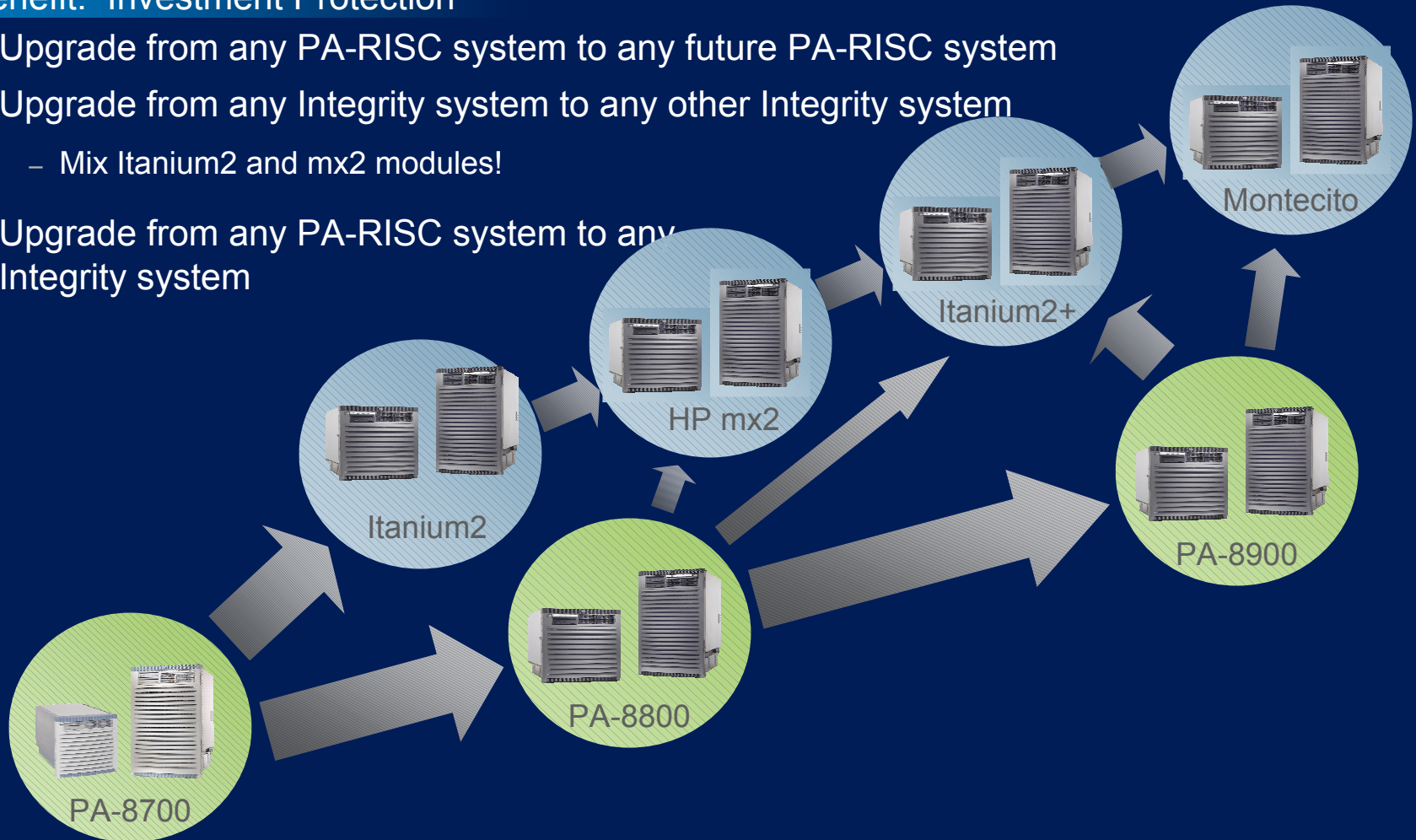
HP Midrange advantages

Investment protection



Benefit: Investment Protection

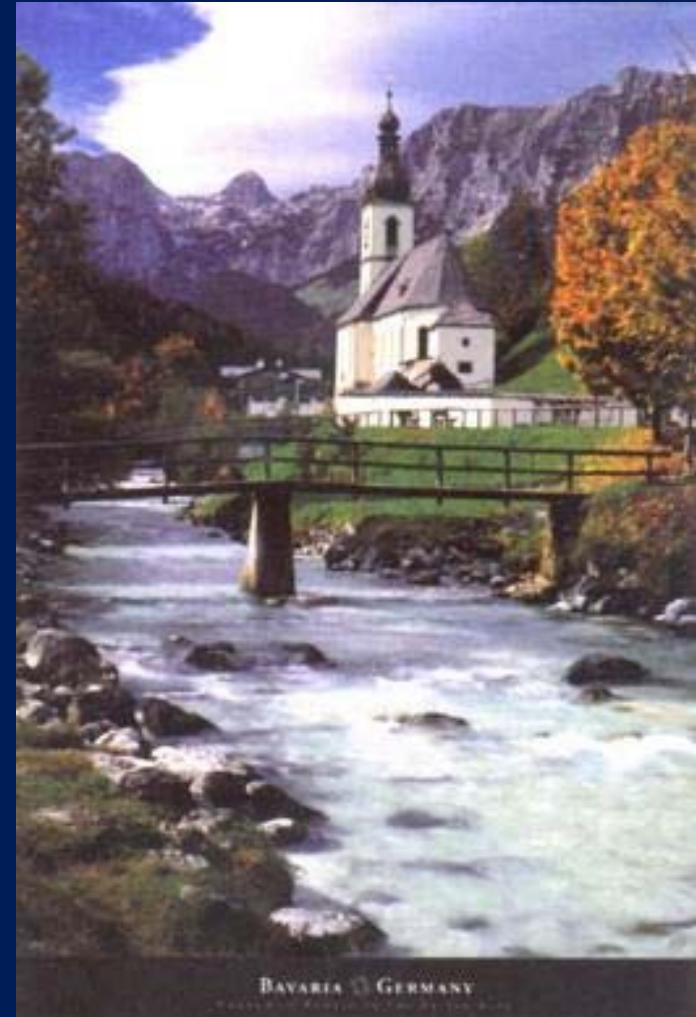
- Upgrade from any PA-RISC system to any future PA-RISC system
- Upgrade from any Integrity system to any other Integrity system
 - Mix Itanium2 and mx2 modules!
- Upgrade from any PA-RISC system to any Integrity system



All in-box upgrades with no serial number change!

Agenda

- BCS product strategy and investment priorities
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- Strategic focus for HP-UX 11i, Linux, Windows and OpenVMS



Customers benefit from a multi-OS Integrity Servers solution



- Choice
 - Match solution to specific needs
- Investment protection
- Simplicity/cost of ownership
 - One server architecture



Linux for HP Integrity servers

Get ready for takeoff!

- World-record TPC-C performance with rx5670
 - #1 4-cpu results: 136K tpmC @ \$3.94/tpmC
 - #1 clustered results: **New** 1.18 million tpmC @ \$5.52/tpmC
- **New** Oracle9i RAC successes ...



- Largest Itanium 2 deployment is with Linux



Pacific Northwest National Laboratory
...delivering breakthrough science and technology

- 11.8 Tflops of processing muscle
- 5th fastest supercomputer in the world
- A third fewer nodes than a comparable supercomputer

HP + Linux + Integrity = customer value for the most demanding workloads




Linux for HP Integrity Servers

Going the extra mile for enterprise customers

- New server options ideal for the Linux customer
- HP value-added capabilities for the enterprise
 - HP Services
 - HP Serviceguard for Linux, version A.11.15
 - New HP Systems Insight Manager provides systems management for industry standard, multi-OS environments
- Indemnifying customers against SCO action
- Growing the ecosystem through partnerships
 - Leading commercial and technical ISVs available
- Demand quickly ramping for larger systems – sea change in deployments?



HP Integrity rx1600
1u form factor
1 to 2 Low Voltage “Deerfield”
Itanium 2 processors


HP Integrity Servers

64-bit Linux leadership



Improving scalability, performance, and enterprise adaptability

The Integrity cx2600 – the first Itanium 2 for

Telco



NEBS compliant for demanding Telco environments 4u, 2-way

- Debian
- RHEL AS 3
- SLES 9 (2H04)

New

Starting at
\$2800 US
list



- rx1600
1u, 2-way
- SLES 8
 - RHEL AS 2.1
 - RHEL AS 3
 - SLES 9 (2H04)



- rx2600
2u, 2-way
- SLES 8
 - RHEL AS 2.1
 - RHEL AS 3
 - SLES 9 (2H04)



- rx4640
4u, 4-way
- SLES 8
 - RHEL AS 2.1
 - RHEL AS 3
 - SLES 9 (2H04)



- rx5670
7u, 4-way
- SLES 8
 - RHEL AS 2.1
 - RHEL AS 3



- rx7620
9u, 8-way
- RHEL AS 3 (3Q04)
 - SLES 9 (2H04)



- rx8620
17u, 16-way*
- 8-way Linux partitions
- RHEL AS 3 (3Q04)
 - SLES 9 (2H04)



Superdome
8-way Linux partitions

- RHEL AS 3 (3Q04)
- SLES 9 (2H04)

Legend:

SLES = SUSE LINUX Enterprise Server

RHEL = Red Hat Enterprise Linux



Subject to change without notice

* Scalability greater than 8-way has a 2.6 kernel dependency
SLES 9 will be based on a 2.6 kernel

Bringing unique value to mission-critical Windows customers



Market opportunity

Key focus:

- Enterprise database solutions with SQL64

Customer needs:

- Improved 32 bit app performance
- Database consolidation
- Standards-based solution with increased scalability and performance

Solution specifics

Database (OLTP)

- Migrate MS SQL database to SQL64 to drive 32-bit apps

Enterprise resource planning

- Migrate to 64-bit SAP R/3

Supply chain management

- Migrate to 64-bit mySAP APO

Business intelligence, data mining

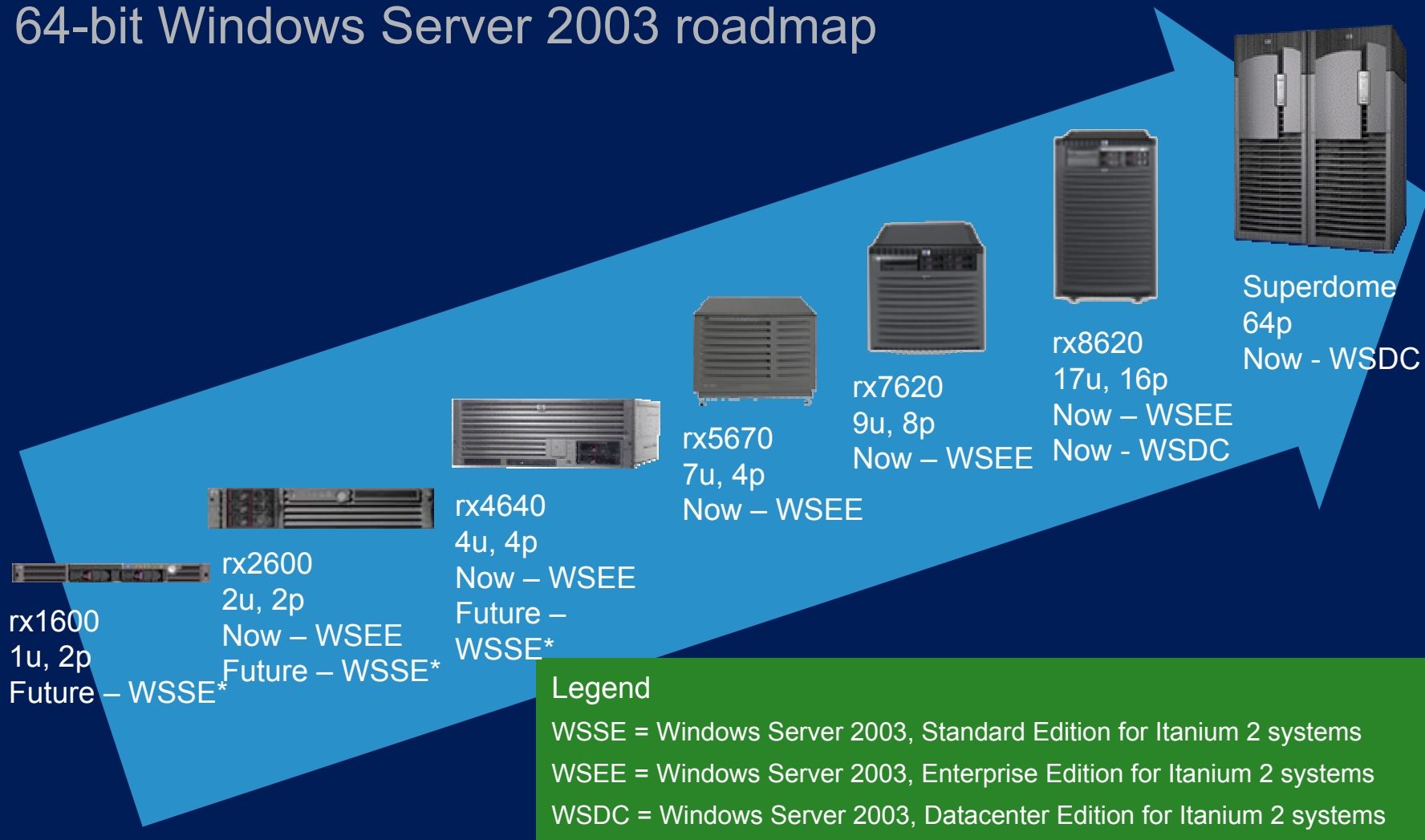
- SQL Server analytics
- SAS (v9.1)
- SAP BW

Financial services

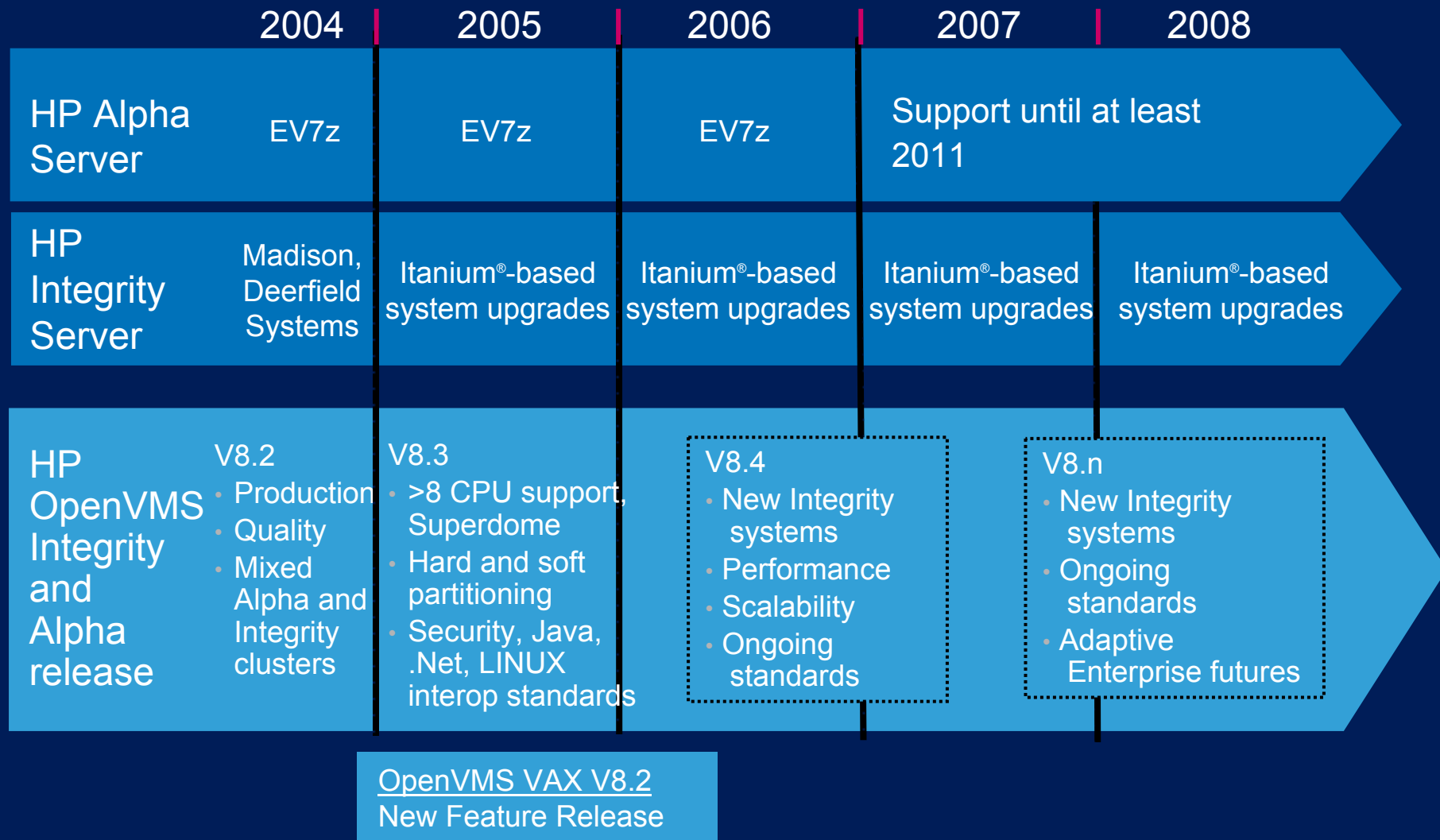
- Migrate Sybase to SQL64

HP Integrity Servers

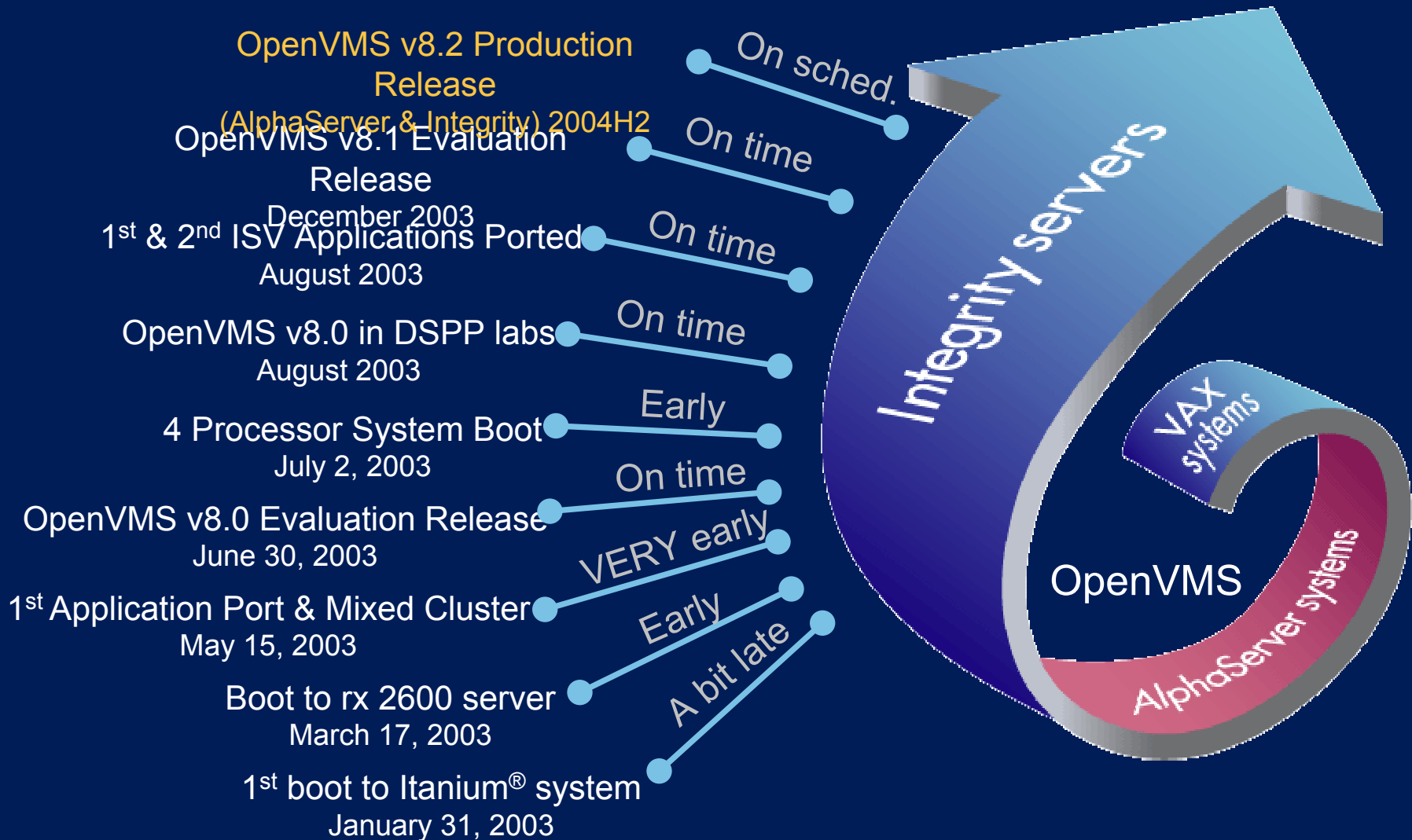
64-bit Windows Server 2003 roadmap



HP OpenVMS roadmap



HP OpenVMS – Itanium® port status exceeding expectations

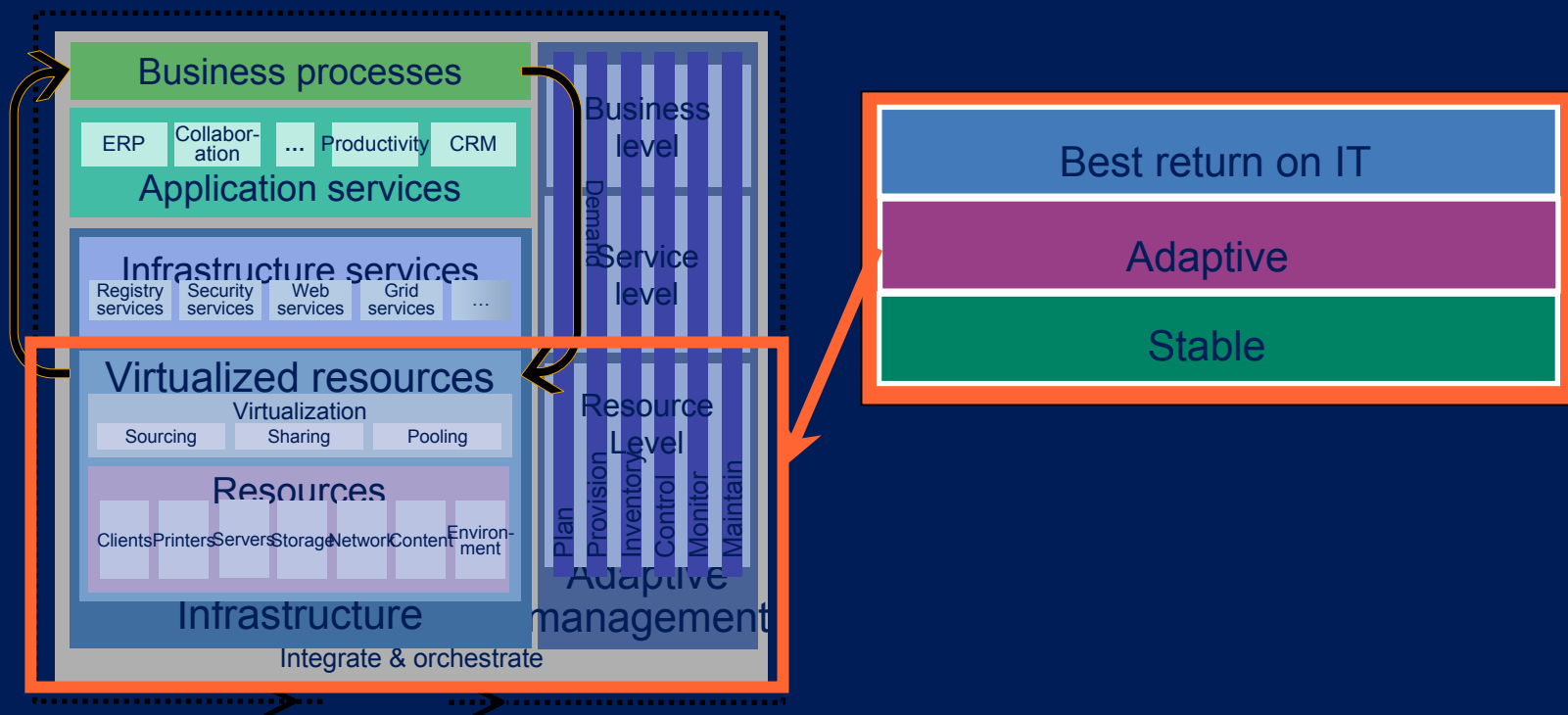




Delivering a robust foundation for the Adaptive Enterprise with HP-UX 11i



Enabling an adaptive enterprise with HP-UX 11i



- Reduce complexity and increases RoIT with HP-UX 11i, a robust and solid mission critical UNIX
- React quickly to dynamic business requirements with HP-UX 11i solutions delivering virtualization, high availability, security, performance, management and LINUX interoperability with the highest quality you expect

HP-UX 11i Schedule Accelerated for HP Integrity Server Capabilities

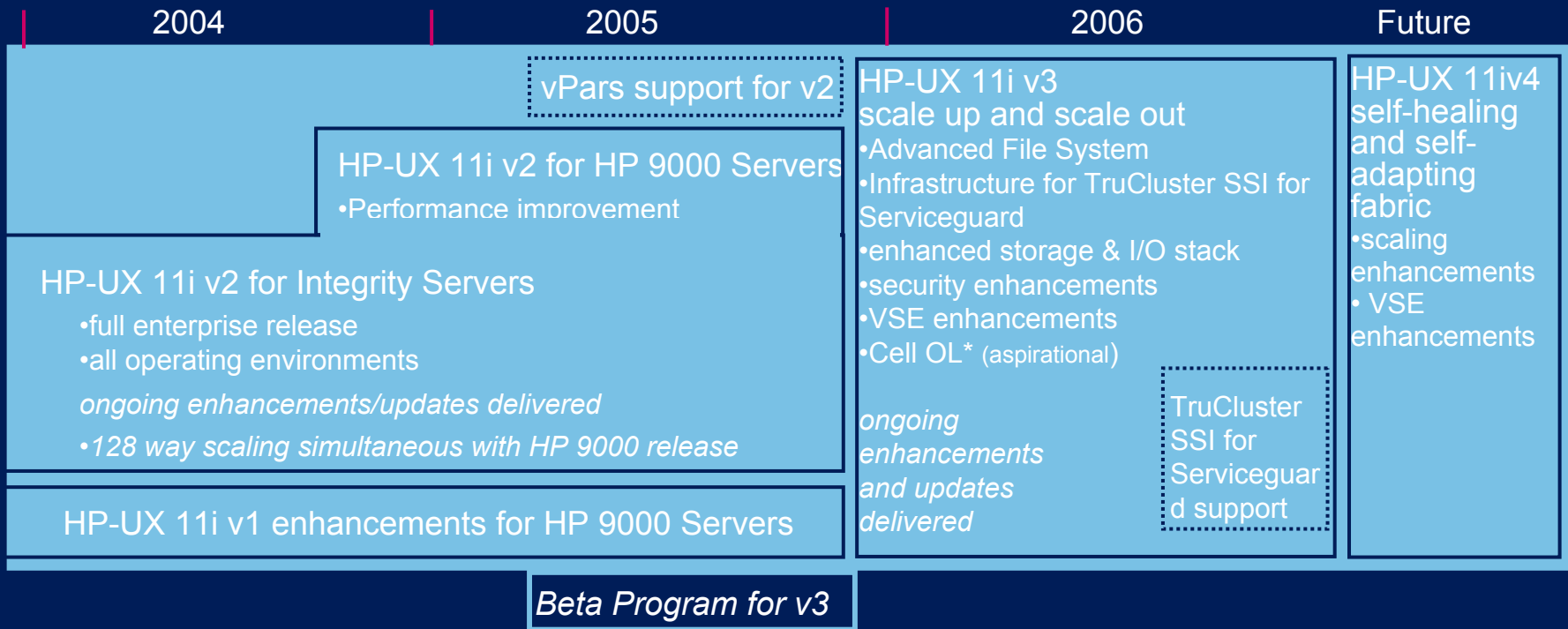


We've listened and are responding to strong customer requests that better meet their business needs:

- ✓ Key functionality accelerated in HP-UX 11i v2
 - Common release for both HP 9000 and Integrity servers available with release of HP-UX 11i v2 on HP 9000 (PA-RISC based) systems, mid H2 CY2004
 - vPars on HP-UX 11i v2 on select HP Integrity and HP 9000 servers, mid H1 CY2005
- ✓ HP-UX 11i v2 ISV momentum is strong and will accelerate as volume continues to increase
 - No impact for Integrity ISVs
 - HP-UX 11i v2 on HP 9000 (PA-RISC) delivers binary compatibility with HP-UX 11i v1 allowing a simple paper certification for our ISVs
- ✓ HP-UX 11i v3 functionality remains unchanged
 - HP-UX 11i v3 planned delivery includes security enhancements, Advanced File System (AdvFS), the infrastructure for TruCluster Single System Image (SSI) for Serviceguard support, and storage and I/O stack enhancements
 - TruCluster SSI for Serviceguard is planned as an update
 - HP-UX 11i v3 Beta Program will be introduced for early adopters

HP-UX 11i roadmap

The UNIX foundation of the Adaptive Enterprise



HP-UX 11i is your operating environment for IT enterprise virtualization – flexibility is key

HP-UX 11i v2 Full ecosystem accelerated making it the version of choice

- Simplicity with the common release for HP 9000 and Integrity servers

HP-UX 11i v3 Advances leadership in scale-up and scale-out

- HP remains committed to Tru64 UNIX customers bringing best technology from Tru64 UNIX into HP-UX 11i & Serviceguard (AdvFS and TruCluster Single System Image)

Continuous innovation

HP-UX 11i v2 enhancements – mid H2 CY2004



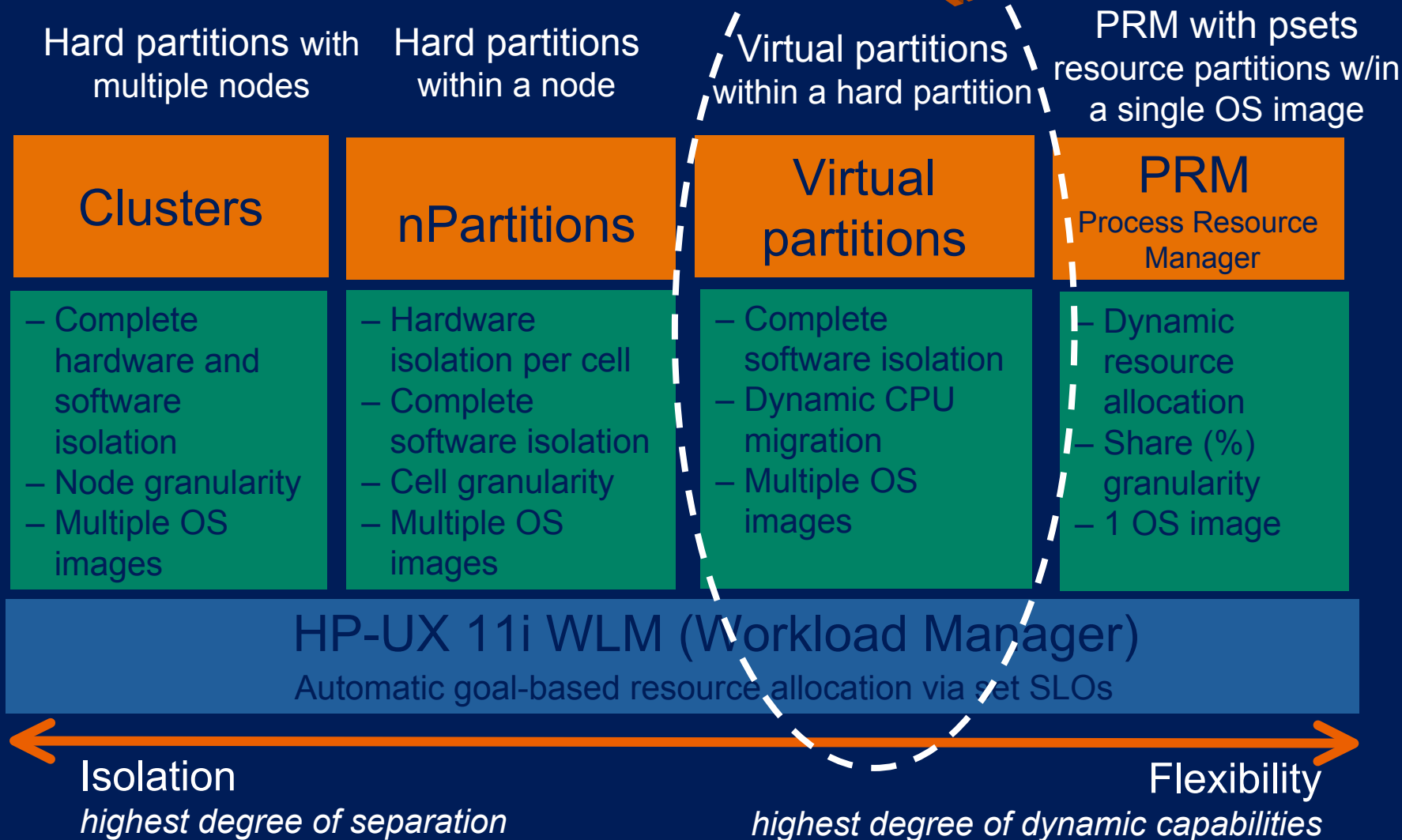
- Choice and flexibility
 - HP-UX 11i v2 on both HP Integrity and HP 9000 servers
 - common code
 - same features/functionality
- Easier HP-UX 11i system administration
 - same install, patch, update processes for both architectures
- Scalability enhancements for HP Integrity servers
 - 1-128-way support
- Performance/scalability enhancements for HP 9000
 - 15-25 percent performance improvement
 - large file system support for 32 TB
 - 1-128-way support

HP partitioning continuum

Service level and cost control

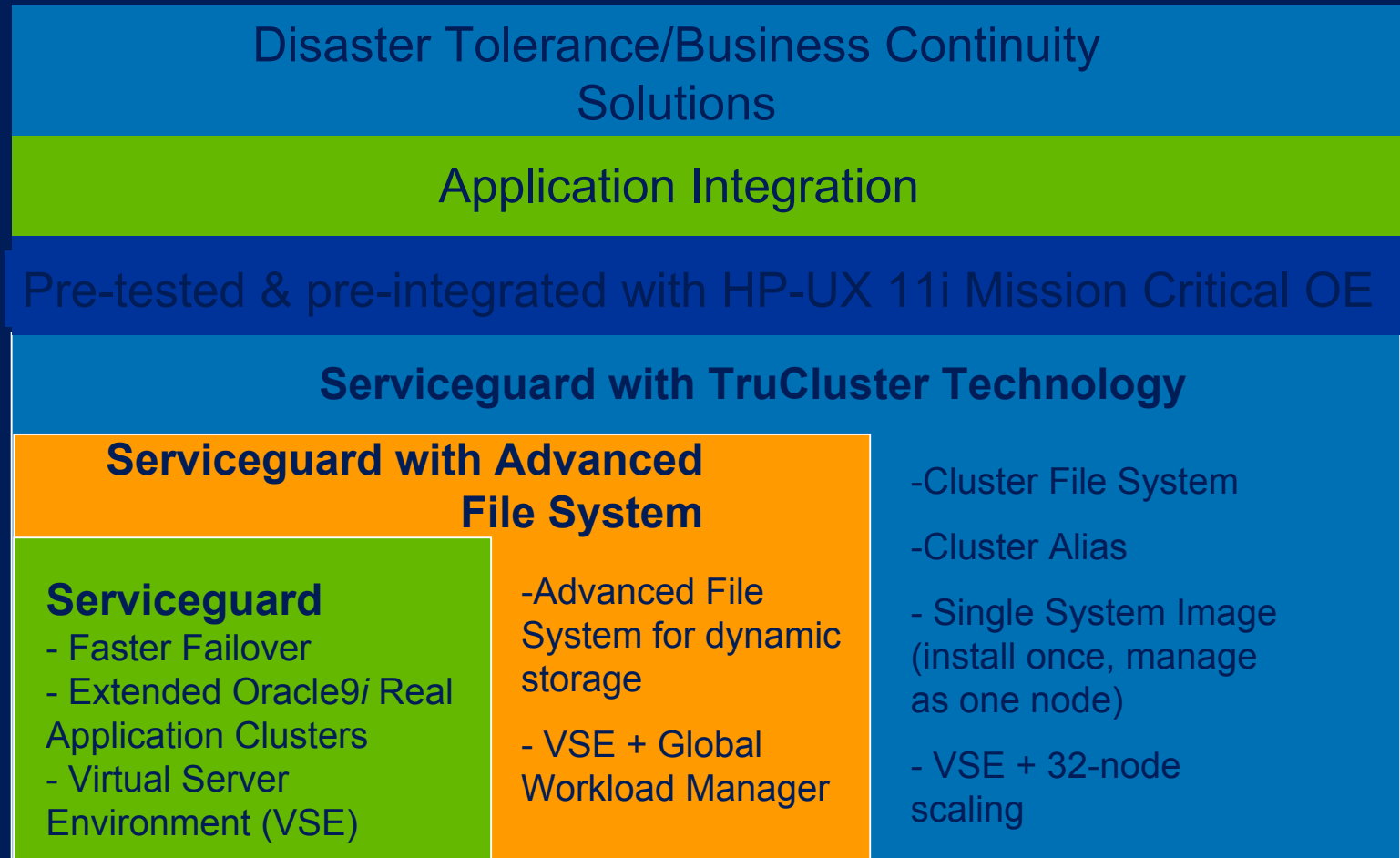


NEW on V2



HP clustering continuum

High availability for HP-UX 11i environments



Failover

+Simplified Management

