OpenVMS Delivers the Adaptive Enterprise Today

Session 3846

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Agenda

- Business challenges and the Adaptive Enterprise

- HP business critical systems' offerings for the Adaptive Enterprise
  - Continuous, secure operations
  - Automated, Adaptive Management
  - Dynamic resource allocation
  - Foundation for the future

- How OpenVMS is delivering on the Adaptive Enterprise vision TODAY
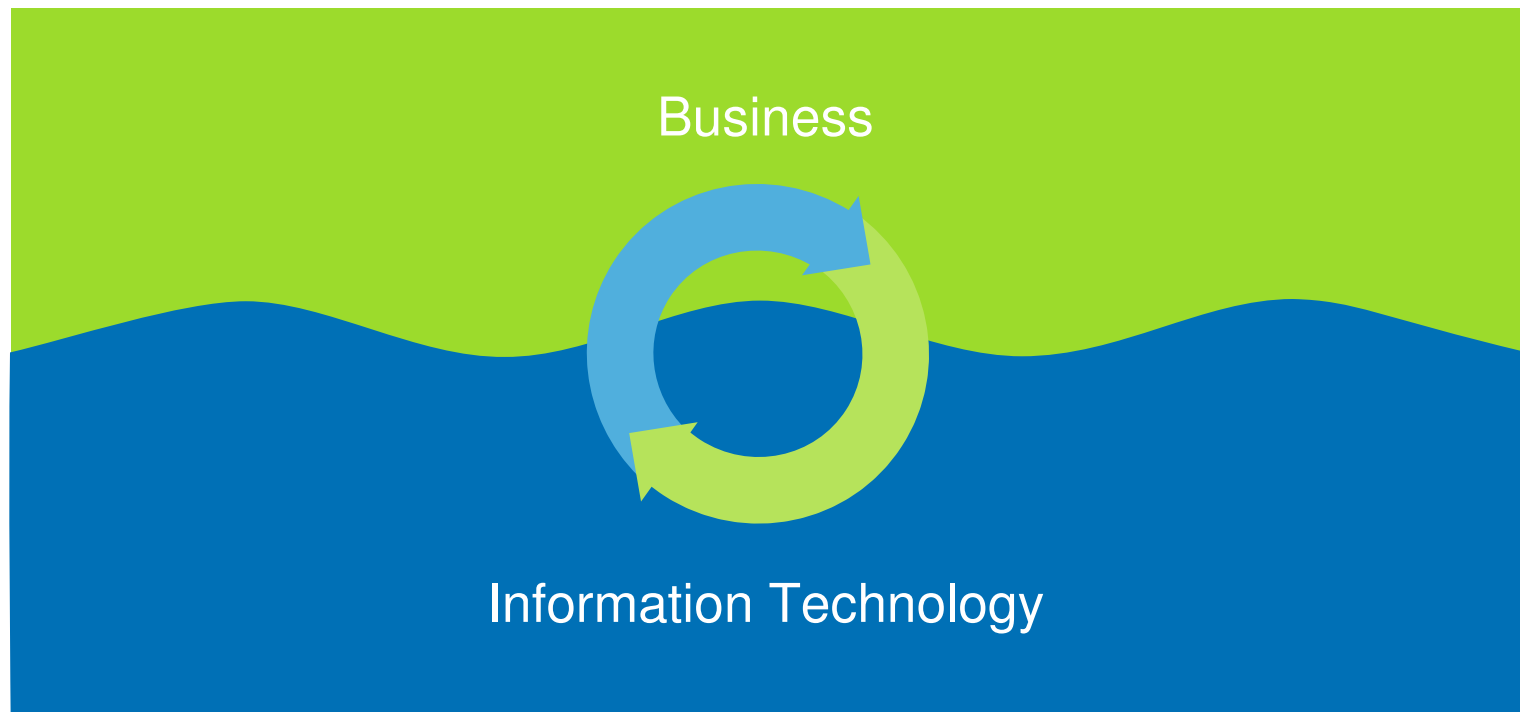
Integrity Servers

VAX Systems

AlphaServer Systems

The industry is moving to a new model of computing
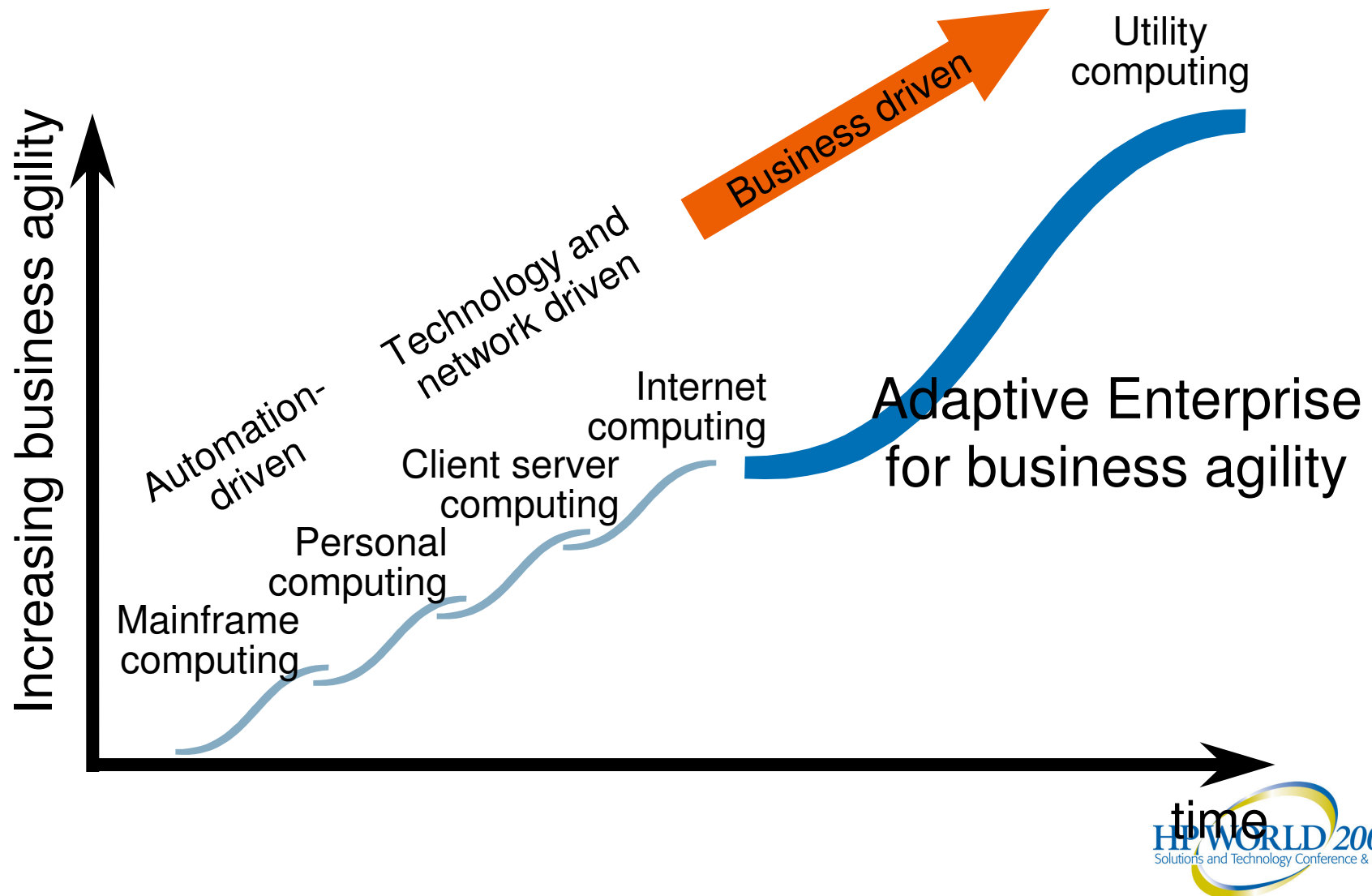
The Adaptive Enterprise

Business and IT synchronized to capitalize on change

Business

Information Technology

Business benefits: simplicity, agility, value

Today's business challenges require IT to adapt

Increased volume of change

Ability to adapt quickly

Business challenges

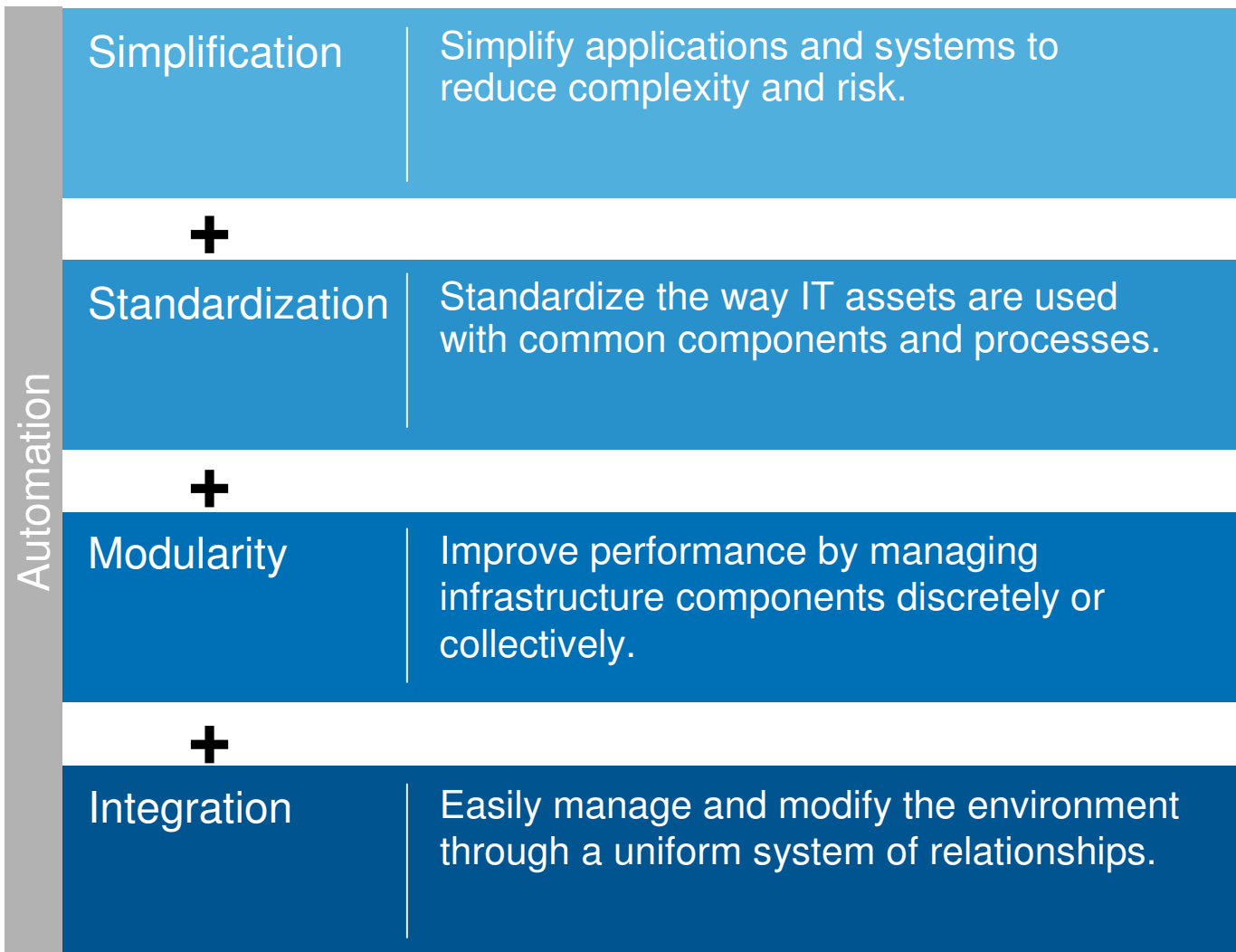- Improve business performance, quality and ROI, while reducing costs

- Minimize risk associated with change

- Drive new business models and direction

- Shorten time-to-market

- Enable mergers, acquisitions and divestitures

IT imperatives

- Link business and IT

- Reduce costs, ensure stability and flexibility

- Reduce complexity

- Optimize assets today and tomorrow

- Extend value and reach of the enterprise

Principles for managing an Adaptive Enterprise

Automation

Simplification	Simplify applications and systems to reduce complexity and risk.

+

Standardization	Standardize the way IT assets are used with common components and processes.

+

Modularity	Improve performance by managing infrastructure components discretely or collectively.

+

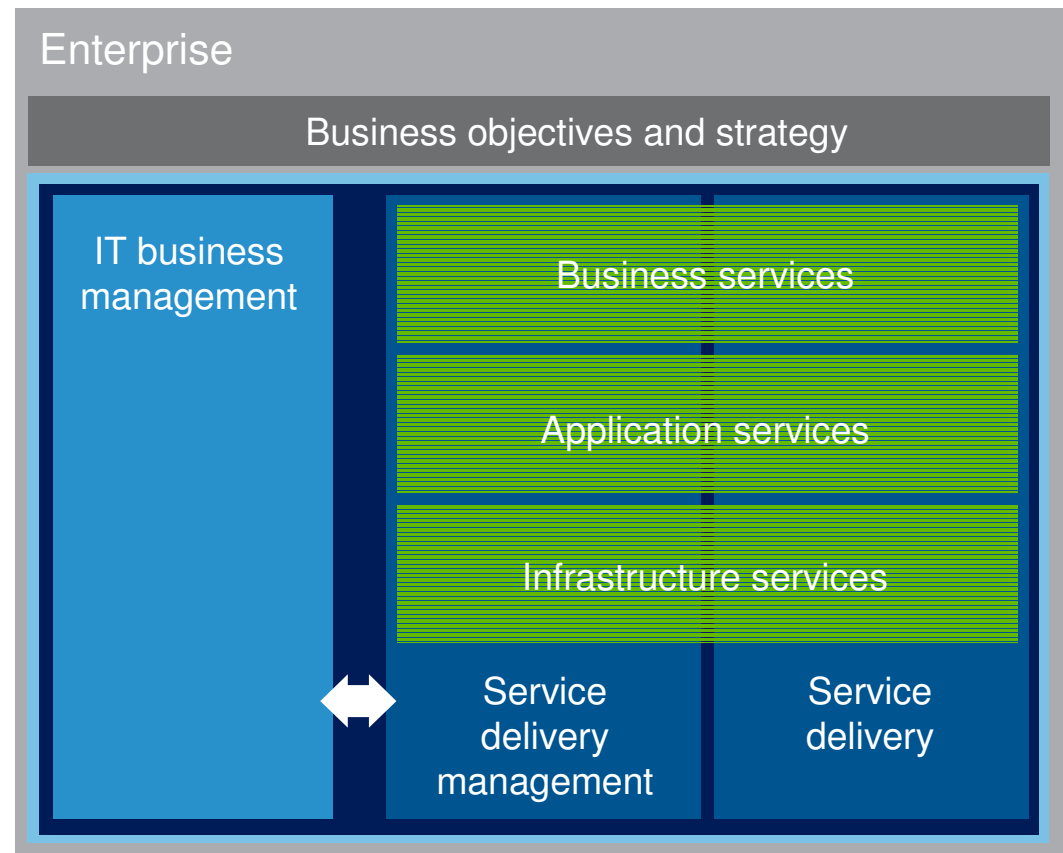| Integration	Easily manage and modify the environment through a uniform system of relationships.

Applied consistently across:

- Business processes
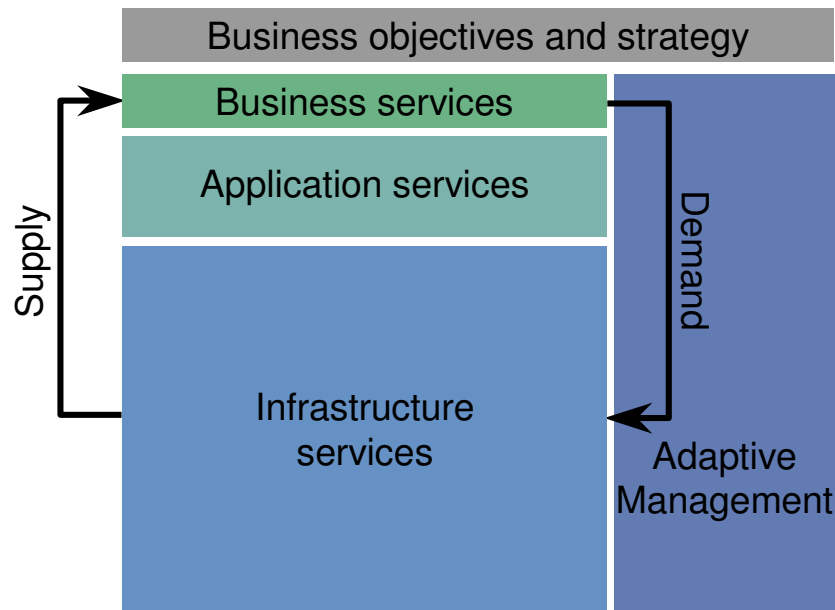- Applications
- Infrastructure

Darwin Architecture for the Adaptive Enterprise

- Apply key design principles consistently across business, application, infrastructure
  - Simplification
  - Standardization
  - Modularity
  - Integration

- Holistic approach: Integrate people, process and technology

Adaptive Enterprise and Management Technology attributes

Business objectives and strategy

Business services

Application services

Infrastructure services

Supply

Demand

Adaptive Management

- Automated intelligent management

- Dynamic resource optimization

- Continuous secure operations

Virtualization – driving complexity out

Today's data center

Ideal computing

Internet

Internet

Virtual resource pool

Virtualization – driving IT economics

Address four key points

- Lower costs
- Improve service levels
- Manage risk
- Enhance agility

Ideal computing

Internet

Virtual resource pool

HP offerings for an Adaptive Enterprise

Areas of focus	BCS and partners
Continuous & secure operations	• Servers • Operating systems • High availability
Automated & intelligent management	• Clustering • Manageability
Dynamic resource optimization	• On Demand portfolio • Virtual Server Environment (VSE) • Utility Data Center (UDC)
Foundation for the future	• Itanium architecture • Business systems evolution

Secure Operations

Crucial, as more and more applications and data are exposed to the Web

OpenVMS - designed from the ground up to overcome security vulnerabilities of contemporary operating systems

Just some of the features designed-in from day one:

- Four level ring protection system

- Strictly separated User and System stacks

- TCP/IP vulnerabilities cannot lead to hacker access to the OpenVMS Kernel

- Design privilege assignments are attached to a mode
  - A malicious program activated in higher mode cannot break out to a user mode as all higher privileges are lost – prevents program privilege tailgating

OpenVMS
"Security by design"

Then

- Security built in to the O/S: no add-on security

- First commercial "C2" O/S VAX/VMS V4 (1988)

- Certificate "C2" & "B1" in 1993

- Security encompasses the entire cluster and certified! (1998 RAMP)

Now

- Supporting new Industry Standards
  - OpenSSL
  - Kerberos
  - CDSA

- Ready for new evaluations and standards
  - DII COE
  20 year commitment
  - IPSEC
  - HIPAA

Future

- Enterprise wide security external authentication for:
  - LDAP
  - Kerberos
  - User defined

- eBusiness security

DEFCON 9 Winner
July 2001, Las Vegas
"Cool and Unhackable"
(>4300 hackers over a weekend)

Solutions and Technology Conference & Expo

OpenVMS and CERT Advisories

- OpenVMS/VMS 52 over **15** years

- AIX 377 since '94

- Solaris 490 over last 5 years

- Linux 417 over last 2 years

- Windows 2000 484 over last 11 months

OpenVMS has achieved US DoD "C2" security ratings. To demonstrate compliance to C2 a security test suite was developed with tests created to assure any security relevant function behaves as documented

Each release must successfully complete the security test suite before it is released

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21

HP clustering products – Choice and flexibility

No matter what your business need, HP has you covered

Serviceguard
(HP-UX and Linux)

#1 UNIX disaster tolerant cluster and high availability fail-over market leader

TruCluster Server

#1 TCO cluster management and easy scale out capability

NonStop ServerNet Cluster

#1 fault tolerant - continuous operation

OpenVMS Clusters

#1 in cluster experience - since 1983

The "**gold standard**" in clustering

"#1 clustering solutions partner… meeting the most demanding needs."

DH Brown clustering study

OpenVMS Clustering and Disaster Tolerance

- Analysts *Illuminata* regard OpenVMS as the "**gold standard**" for Clustering and Disaster Tolerance.

- An excellent paper published in August 2002 comparing it to all popular Unix operating systems is available here:

http://h71000.www7.hp.com/openvms/whitepapers/Illuminata.pdf

Adaptive Management

HP Adaptive Management offerings

Business management

Service management

Infrastructure management

HP OpenView

Utility controller software
(HP utility data enter)

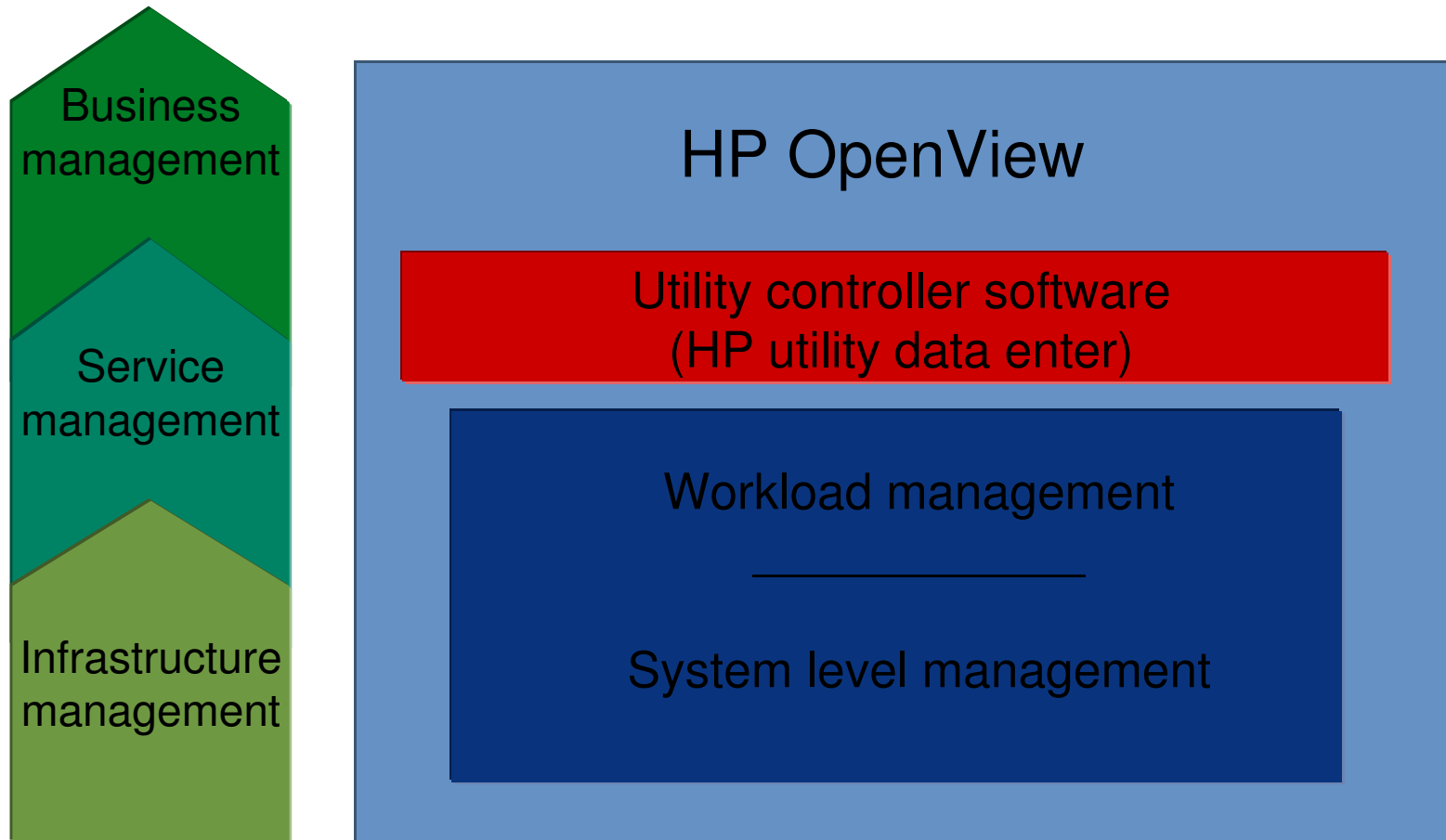Workload management

System level management

OpenVMS Adaptive Management

- ## OpenView Operations Agent for OpenVMS version 1.0

  – Real-time OpenVMS AlphaServer system monitoring and event management utilizing native agents and Smart Plug-Ins (SPIs)

  – Monitors the performance, detects bottlenecks and reports on the availability of the OpenVMS systems and can send alarms and notifications

  ## Shipping NOW

HP Adaptive Management enhancements

- Many of the recent HP Adaptive Management software acquisitions including:
  - Select Access from Baltimore
  - Talking Blocks
  - Extreme Logic
  - Persist Technology
  - Novadigm
  - Consera
  - Trulogica

  ### will embrace OpenVMS over time

Current OpenVMS System Management Partners

- Appmind Software AB
- BMC
- Computer Associates
- COMTEK
- Executive Software
- Heroix/Itheon

- ISE/XUIS
- LEGATO
- MVP System Inc.
- PointSecure
- Raxco
- TECsys Development

HP offerings for an Adaptive Enterprise

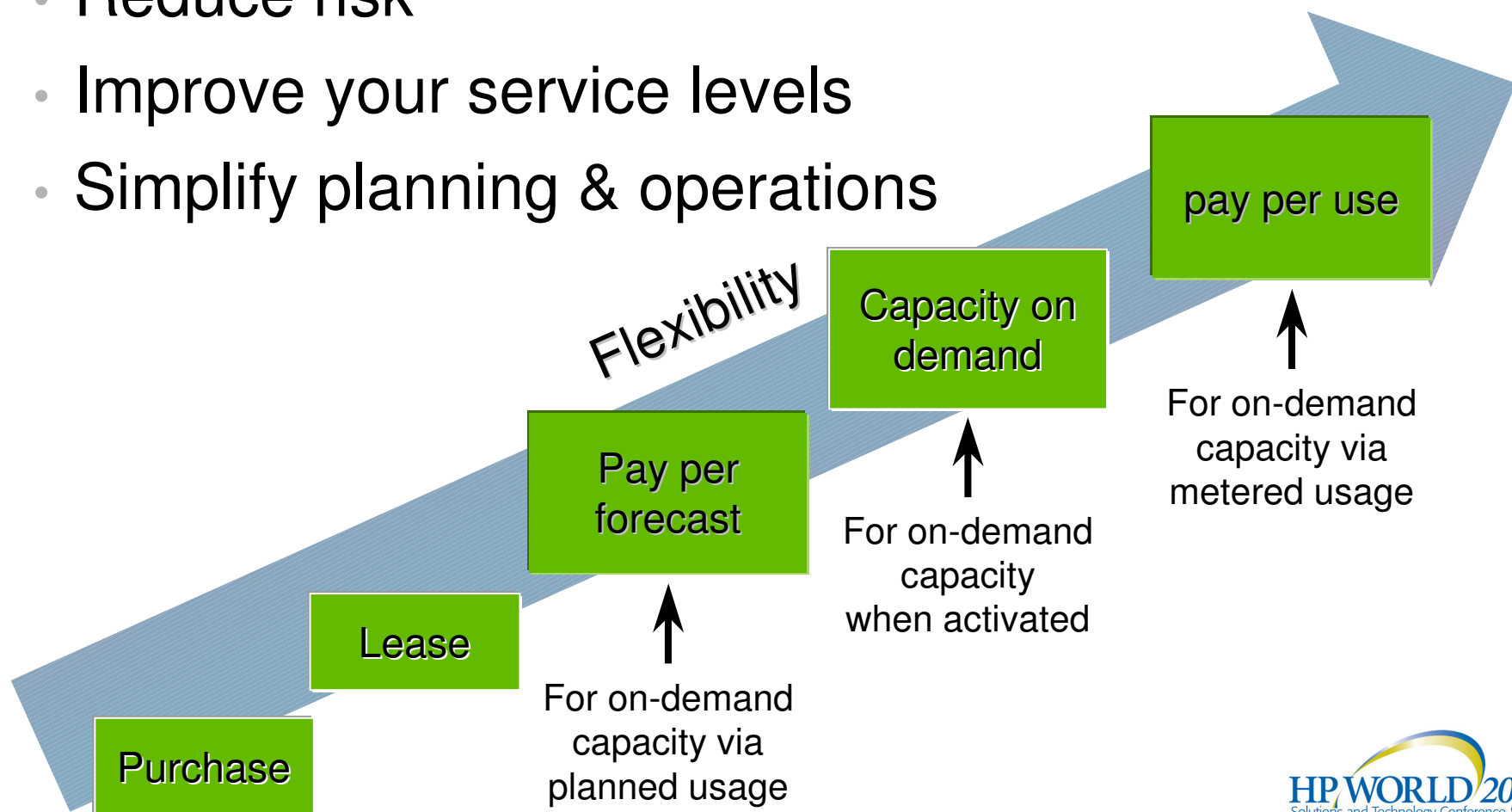| Areas of focus	BCS and partners
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On Demand solutions portfolio

- Align your costs to revenues
- Reduce risk
- Improve your service levels
- Simplify planning & operations

pay per use

For on-demand capacity via metered usage

Flexibility

Capacity on demand

For on-demand capacity when activated

Pay per forecast

For on-demand capacity via planned usage

Lease

Purchase

our customers' problem

the traditional business model is challenged in the internet age

customer issues

- significant upfront investments
- costs not in line with revenues
- correct capacity is a moving target
- supply struggles with demand
- competitive advantage challenging

too much capacity, wasted profit

needed capacity

it cost

missed SLA's, dissatisfied customer

time
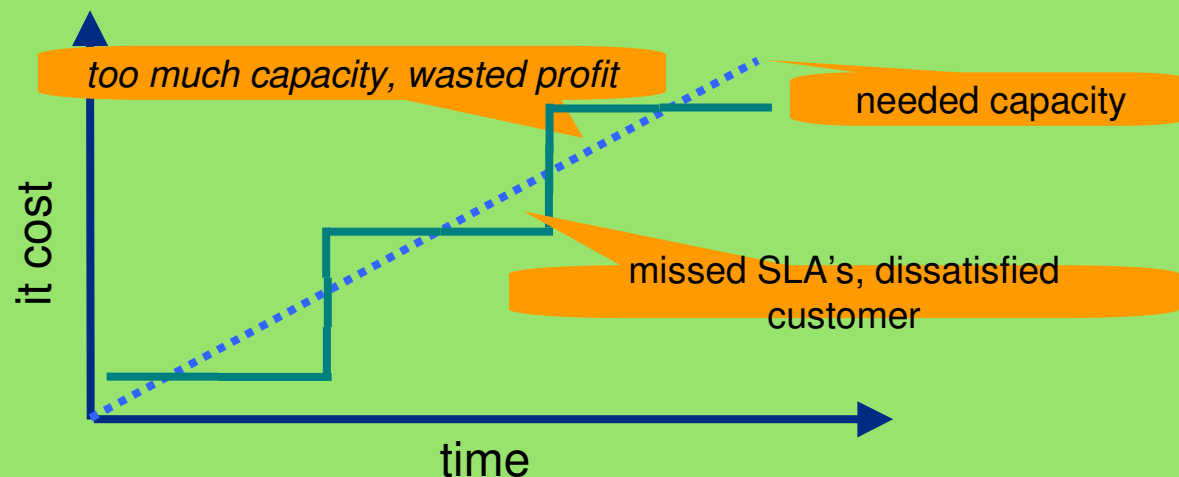
traditional capacity planning meant sizing for an unknown but anticipated peak

OpenVMS Utility Pricing Status

- Pay Per Forecast   NOW

- Capacity on Demand   NOW

- Per Processor Licensing   OpenVMS 8.2
                                                        end 04

- Metered Usage/Pay Per Use   2005
  – Detailed engineering studies have begun
  – Integration into HP Billing Systems underway
  – Goal is to ship on OpenVMS 8.3 Itanium in 2005

HP OpenVMS I64 Operating Environments Revision 2.8

OpenVMS I64 Mission Critical Operating Environment (MCOE)

OpenVMS I64 Enterprise Operating Environment (EOE)

OpenVMS I64 Foundation Operating Environment (FOE)

- OpenVMS Operating System
- OpenVMS Unlimited User Licensing
- TCP/IP Services for OpenVMS
- DECnet-Plus for OpenVMS End System
- DECwindows Motif for OpenVMS
- DECnet IV
- Performance Data Collector

Integration Technologies
- BridgeWorks
- COM for OpenVMS
- Secure Web Server (SWS)
- Secure Web Browser (SWB)
- SDK for the Java™ Platform
- XML Technology
- NetBeans
- Simple Object Access Protocol (SOAP) Toolkit
- Kerberos
- Enterprise Directory
- CDSA
- SSL
- OpenSource Tools

Add to Foundation:
- **RMSjournaling**
- **VolumeShadowing**
- **DECram**
- **OpenVMS System Management Tools**
  - OVMS Management Station
  - Enterprise Capacity Planner - ECP
  - Availability Manager
  - OpenVMS Web Agents
  - OpenVMS WEBM/CIM

Add to Enterprise:
- **OpenVMS Clusters**
- **OpenVMS RTR Backend**

One DVD media for all 3 OE's
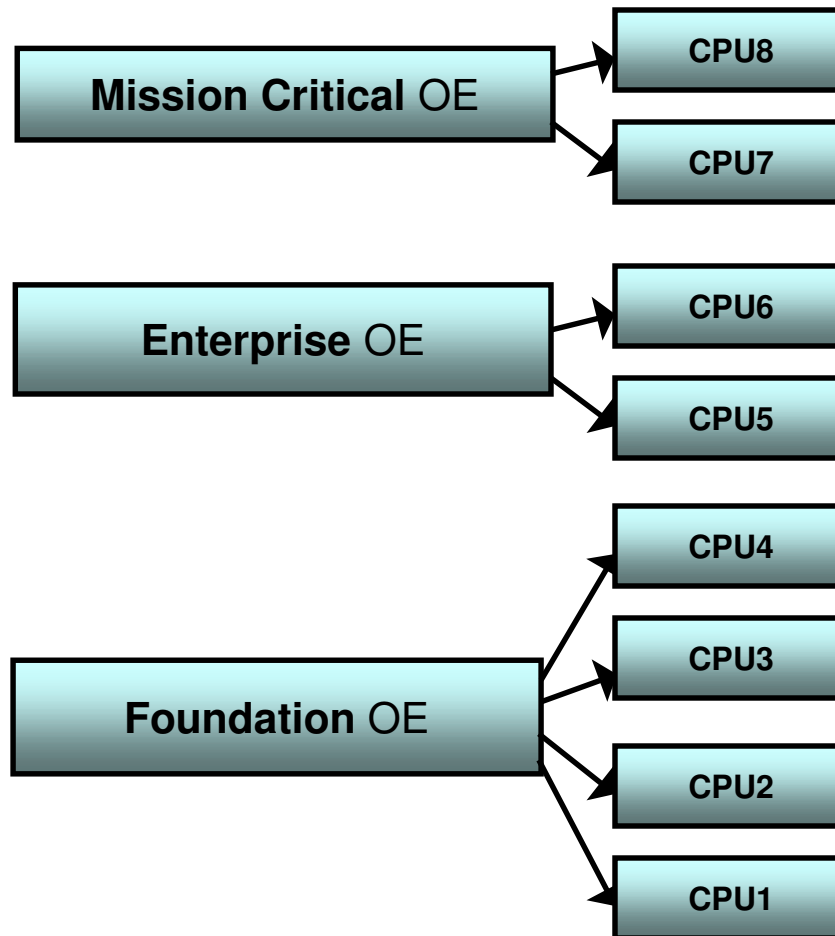
Easier to order

Easier license management

Straight forward installation of OE's from a single DVD

Simpler support contracts

➔ higher customer satisfaction

Per Processor Licensing
with multiple OpenVMS Operating Environments (OE)

HP partitioning continuum strategy

multiple clustered nodes hard partitions virtual partitions resource partitions

hard partition

1 OS image

OS image with HW isolation

OS image with SW isolation

Application 1 with guaranteed compute resources

OS image with HW isolation

OS image with SW isolation

Application 2 with guaranteed compute resources

OS image with HW isolation

OS image with SW isolation

Application N with guaranteed compute resources

based on CPUs or percentages
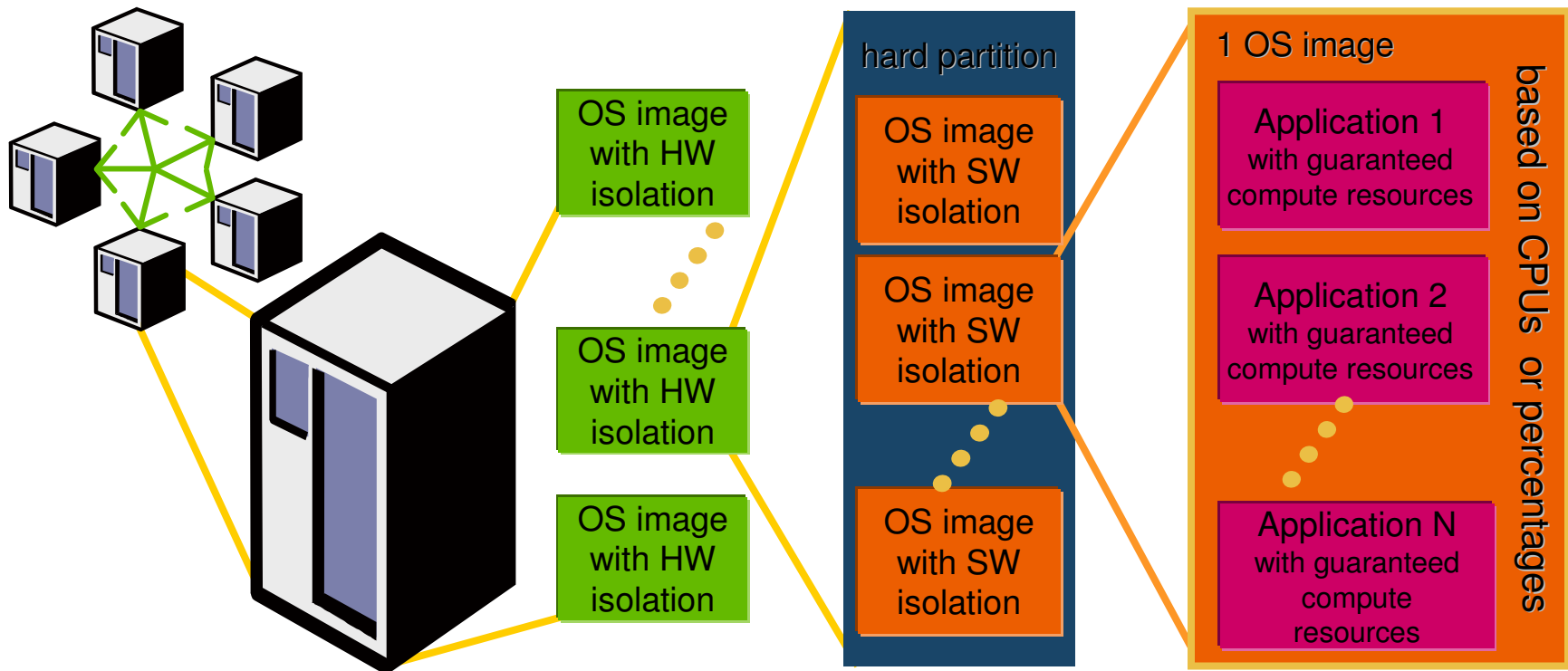
Workload Management

isolation
highest degree of separation

flexibility
highest degree of dynamic capabilities

Why Virtualization?

- ## Enables server consolidation today
    - Reduce HW & management costs

- ## Improve datacenter efficiency in the future
    - Increase server resource utilization
    - Improve responsiveness to changing workloads
    - Simplify operations lifecycle - development, testing deployment, legacy stages

Workload Manager

- Workload Manager (WLM) ties together:
  - Partitioning
  - Resource Management
  - On-demand Resources
  - Clustering

- Linking them back to business goals and Service-Level Objectives – SLOs

- WLM communicates with the OS-specific subsystems to control actual usage of CPUs, Memory and Disk

Workload Manager on OpenVMS?

- Code is being ported now with increasing number of functions running

- Plan to ship on OpenVMS 8.3 Alpha and Itanium by end-2005

- Process Resource Manager (PRM) has a direct equivalent on OpenVMS as *Class Scheduler*

Soft Partitions on OpenVMS?
OpenVMS Galaxy

- High-speed communication between instances using Read/Write Shared Memory
  - cluster
  - LAN
  - database
- O/S uses direct interrupts
- O/S reads private memory
- CPU reassignment
- Server consolidation
- Optimize different work loads

VMSClusters and Galaxy for disaster tolerance

Regional Medical Center A

Regional Medical Center B

Regional Medical Center C

3 x ATM Wide Area Cluster

Central Medical Records Database

Replicated

Instance A — CPUs 0 1 2 — Private A
Instance B — CPUs 3 4 5 6 — Private B
Instance C — CPUs 7 8 9 — Private C
Shared Memory

Instance A — CPUs 0 1 2 — Private A
Instance B — CPUs 3 4 5 6 — Private B
Instance C — CPUs 7 8 9 — Private C
Shared Memory

3 x Fibre Channel

100 GBs each

HP offerings for an Adaptive Enterprise

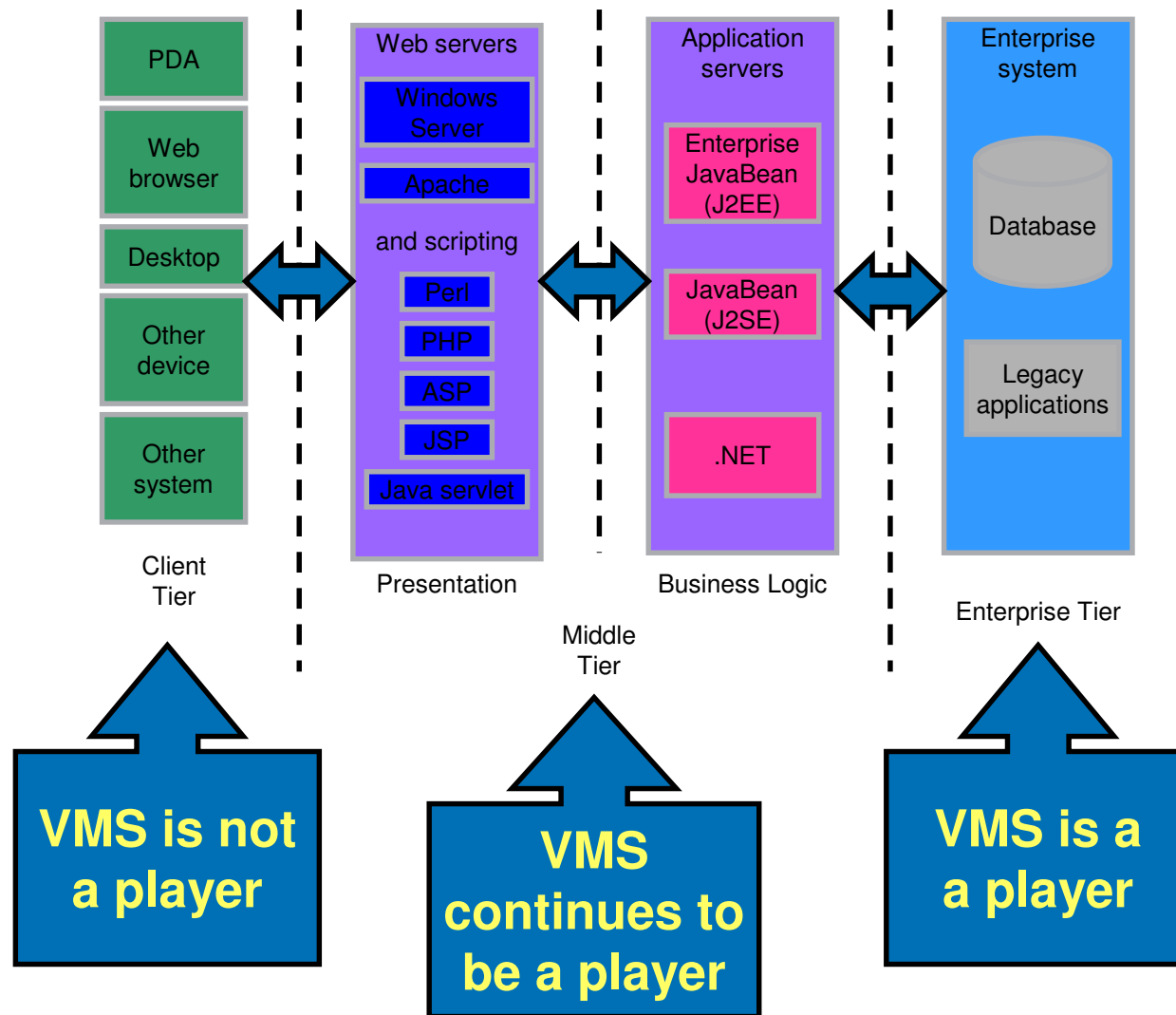| Areas of focus	BCS and partners
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Business Systems Evolution

- Embracing Legacy Applications and Data

- Extending the ROI of existing applications

- Increasing revenue and reducing costs

- Reducing both development costs and response time
  - by developing new solutions with Web Services

- Ensuring applications running on OpenVMS can be accessed from non-OpenVMS clients and platforms

Where OpenVMS Plays

Client Tier	Presentation	Business Logic	Enterprise Tier

Client Tier:
- PDA
- Web browser
- Desktop
- Other device
- Other system

Web servers:
- Windows Server
- Apache

and scripting
- Perl
- PHP
- ASP
- JSP
- Java servlet

Application servers:
- Enterprise JavaBean (J2EE)
- JavaBean (J2SE)
- .NET

Enterprise system:
- Database
- Legacy applications

Client Tier

Presentation

Middle Tier

Business Logic

Enterprise Tier

VMS is not a player

VMS continues to be a player

VMS is a a player

OpenVMS Web Services Products

HP Products:

- Compaq Secure Web Server
- Tomcat & Ant build environment
- Java 2 SDK and Fast VM
- SOAP and AXIS
- Xerces and Xalan
- Attunity Connect On Platform
- BridgeWorks
- Enterprise Directory Services
- NetBeans
- DECdtm V2.0 - XA Industry Standard Interface
- Reliable Transaction Router
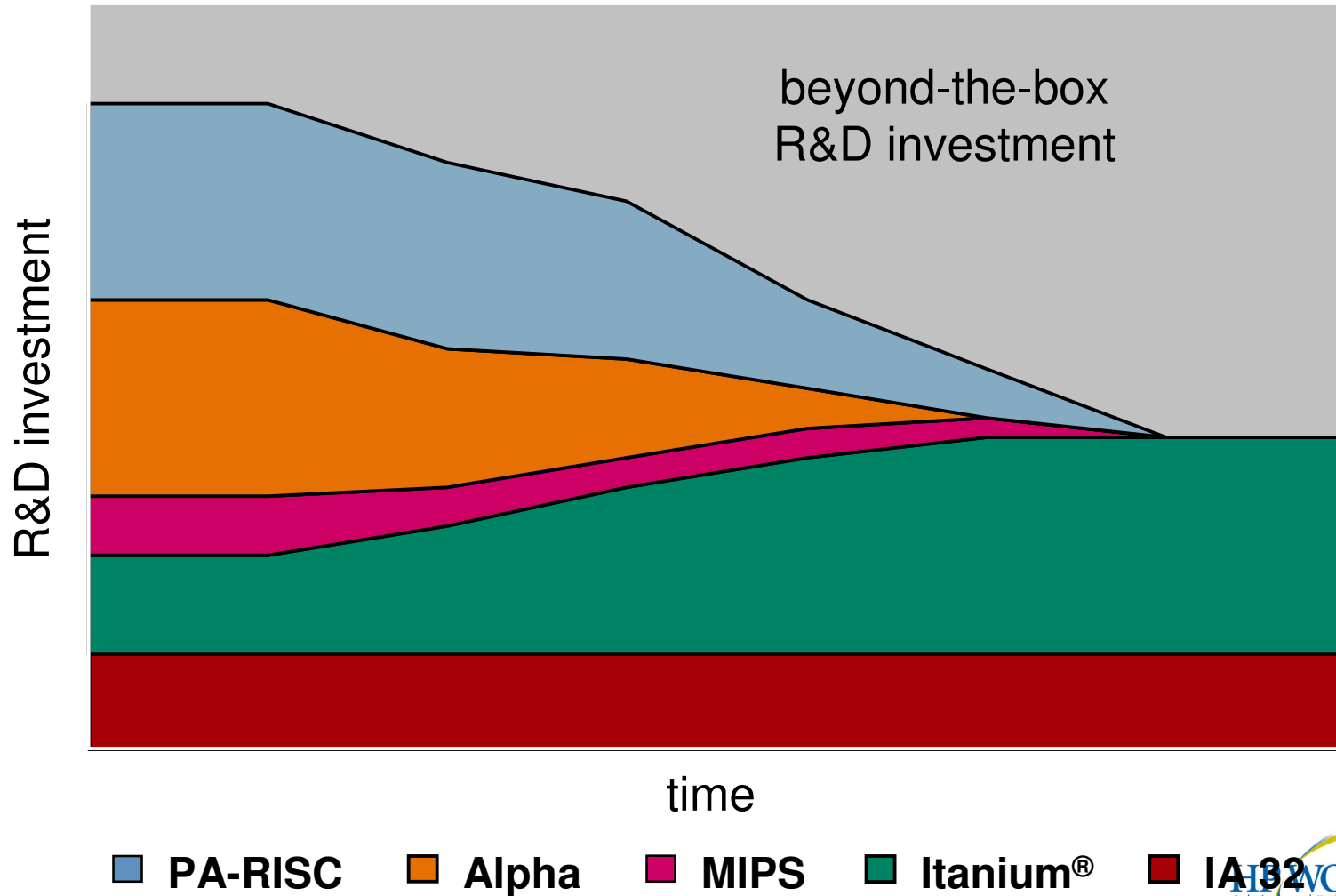
Partner products:

- BEA WebLogic Server
- Compuware Optimal J and Optimal View
- Ericom Suite
- IBM MQ Series/JBMQ
- InterSystems Ensemble
- IONA Orbix 2000 and iPas
- Xoology Concerto

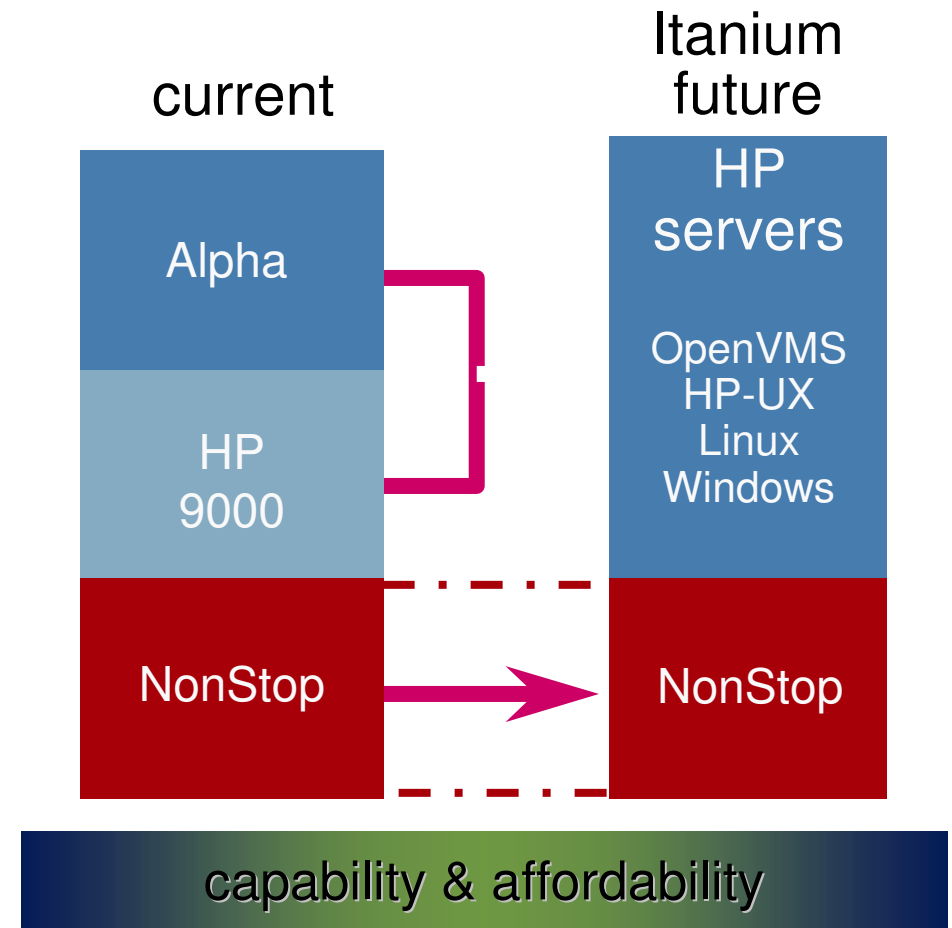# Industry Standard Hardware

Reducing costs and guaranteeing longevity

Investing beyond the box
Focused Innovation

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HP Enterprise Integrity Server Line

- ## Choice & flexibility
  - One microprocessor, multiple operating environments
  - Industry standards driven

- ## Higher performance, lower costs
  - Economies of scale
  - Leveraged costs
  - Next-generation technology

current

Itanium future

Alpha

HP 9000

NonStop

HP servers

OpenVMS
HP-UX
Linux
Windows

NonStop

capability & affordability

OpenVMS Implementation of Adaptive Enterprise Components and Timeline

Adaptive Enterprise Components		2003	1H04	2H04	1H05	2H05	1H06	2H06
			OpenVMS 8.2 ship ↓		OpenVMS 8.3 ship ↓			
Web Services	XML, SOAP, WSDL, J2EE etc.							
Management	OpenView and SPIs							
	Workload Manager (WLM)		< Port underway					
	Process Resource Mgr (PRM)	OpenVMS Class Scheduler						
Utility Pricing	Pay Per Forecast							
	Capacity On Demand							
	Pay Per Metered Usage		< Detailed engineering studies begun					
	Per Processor Licensing							
Virtualization Technology	Soft Partitions (Galaxy)							
	Hard Partitions							
Continuous Secure Operations	High Availability							
	N-site Disaster Tolerance & Recovery							
	Clusters							
	Network-wide Authentication	EAK available						
	C2							
	Cluster-wide domains							
Platform	Itanium							
	Alpha							

▬▬▬ Indicates the phasing in of this component

OpenVMS

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