ProLiant Hardware Solutions for Scale-Out and Scale-up Scenarios

Stan Grant
WW IT Consolidation Programs
Hewlett Packard
Industry Standard Servers
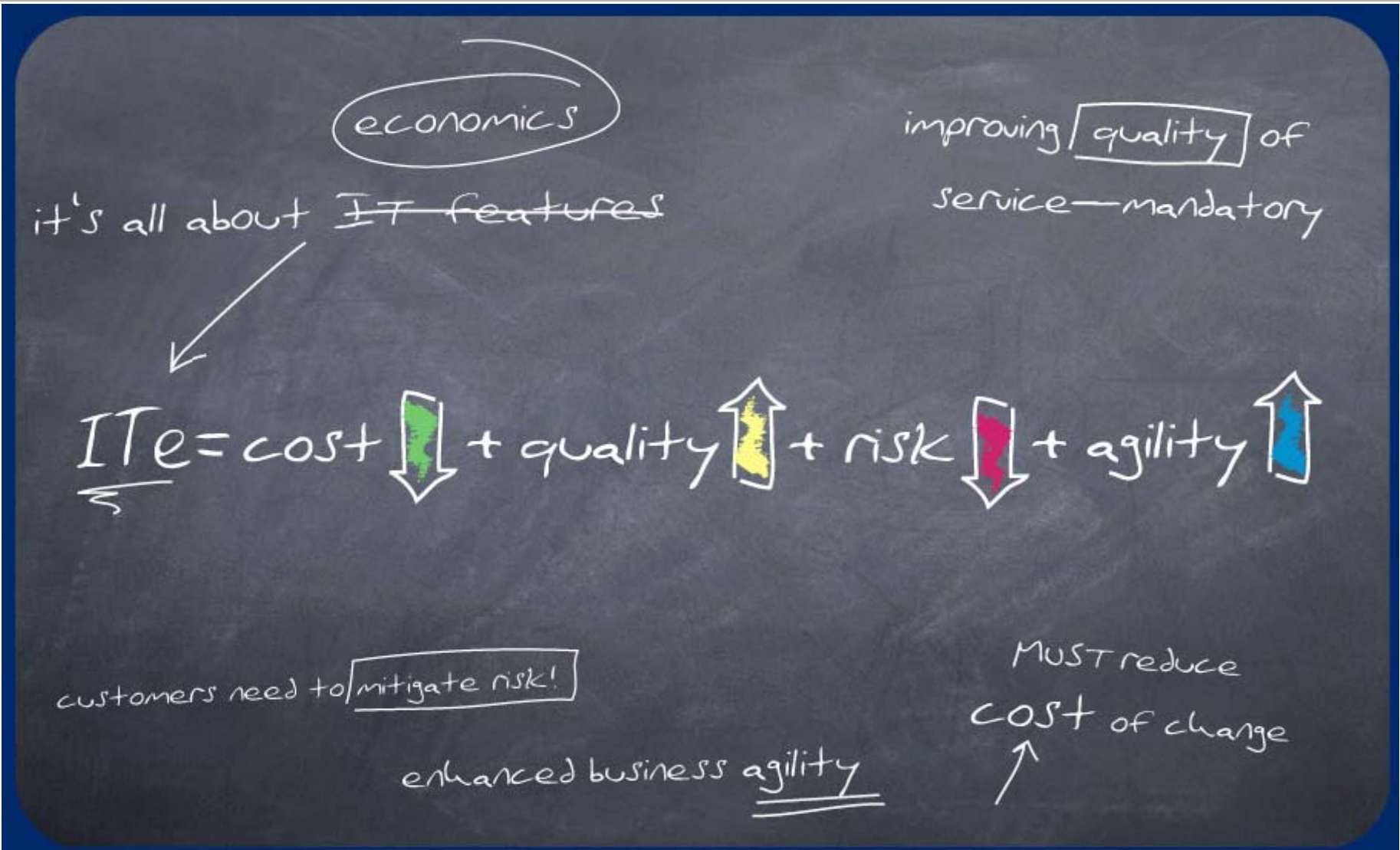
Expectations

For you:

- At the close of this session, you should be familiar with these topics:
  - Which ProLiant platforms offer the best solution in a scale-up & scale out consolidation scenario
  - How blades can help with consolidation
  - How the ProLiant and VMware work together to solve customer problems

For me:
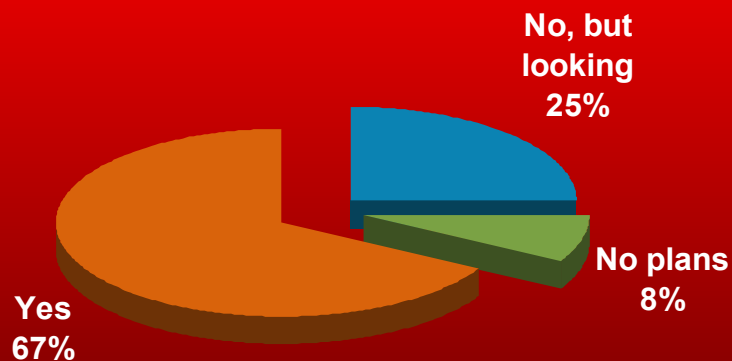
- Feedback and your experiences

IT Consolidation
Focus on IT economics

economics

it's all about ~~IT~~ features

improving quality of service—mandatory

$$ITe = cost \downarrow + quality \uparrow + risk \downarrow + agility \uparrow$$

customers need to mitigate risk!

enhanced business agility

MUST reduce cost of change

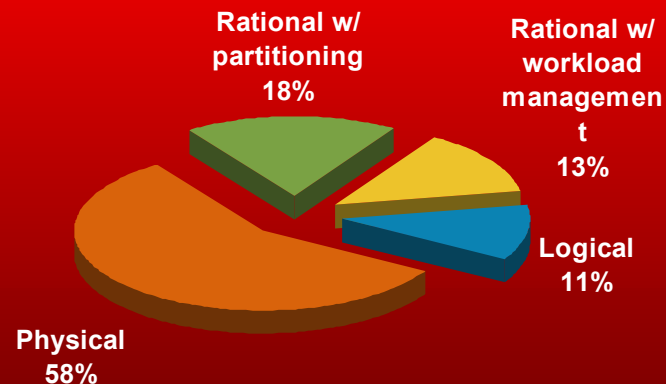# Thinking about consolidation? You are not alone

- 92% planning or performing consolidation
- Physical and partitioning consolidation lead the way

Do you have a server consolidation project under way?

No, but looking
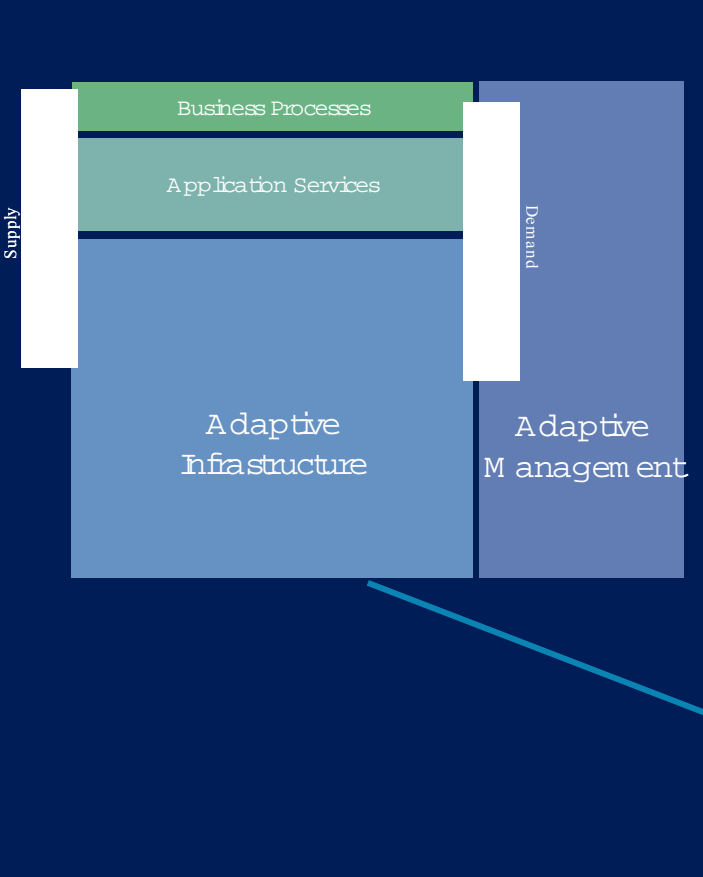25%

No plans
8%

Yes
67%

Source: Gartner Inc. 2003

What type of consolidaton projects are you looking at or deploying?

Rational w/ partitioning
18%

Rational w/ workload management
13%

Logical
11%

Physical
58%

Source: Gartner Inc. 2003

HP Industry Standard Servers for an Adaptive Enterprise

HP WORLD 2003
Solutions and Technology Conference & Expo

Supply

Business Processes

Application Services

Demand

Adaptive Infrastructure

Adaptive Management

Market leadership – Agile technology

- Based unifying industry standards
- Powered by industry defining technologies
- Scalable to your unique environment

ProLiant Essentials

- Valuable tools
- Unique integration with HP Openview

Solutions and Services

- Strong, collaborative industry partnerships
- Integrated with services and solutions

New Drivers for Industry Standard Consolidation

Industry
Standard
RoIT

Legacy
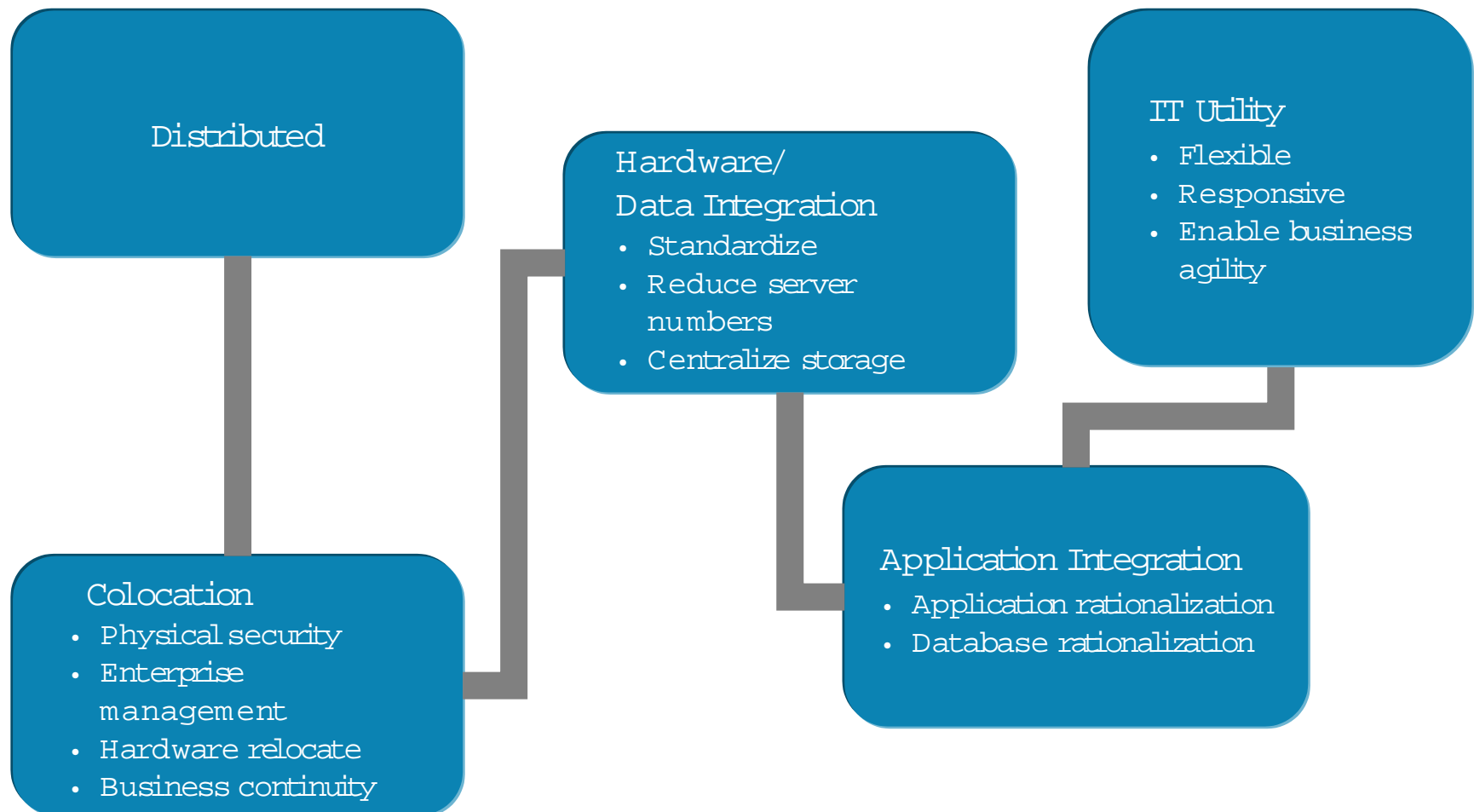Infrastructure

Technology

- **IT Economics –** *Doing More with Less*
  - More computing power for less money and lowered risks
  - Cost bar for scalability is lower than ever

- **Legacy Factor** - *Primed for Replacement*
  - 3+-yr old servers are ideal candidates
  - Market data showing a preference to stay with Windows or explore Linux; no migration to Unix

- **Technology** - *Capabilities Rising*
  - Xeon MP, RAID memory, blades, Itanium, clustering options, HPTC
  - Storage migration - DAS to NAS/SAN
  - Next-gen management, partitioning, workload, performance & deployment management, access capabilities

Types of Consolidation

HP IT Consolidation Journey— Finding your way

Distributed

Hardware/ Data Integration
- Standardize
- Reduce server numbers
- Centralize storage

IT Utility
- Flexible
- Responsive
- Enable business agility

Colocation
- Physical security
- Enterprise management
- Hardware relocate
- Business continuity

Application Integration
- Application rationalization
- Database rationalization

Spectrum of Server Consolidation Definitions

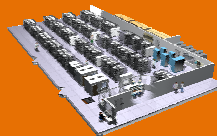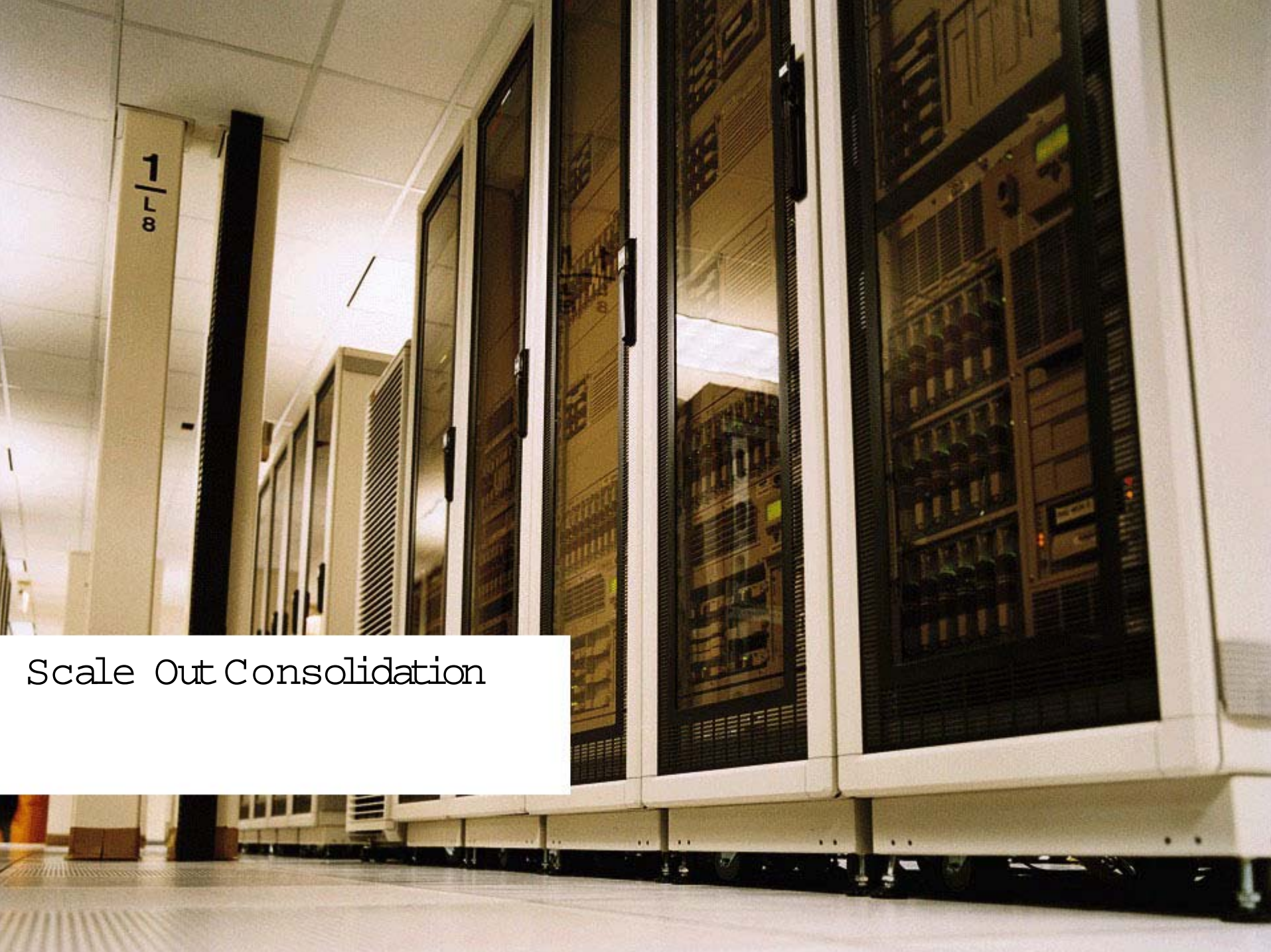|	Scale Out				Scale Up
types	Physical Consolidation	Compute Consolidation	Management Consolidation	Application Consolidation	Workload Consolidation
how	Relocating Server to Data Center		Consolidating Multi-data		Consolidating Users to Servers
why	Reduced Hardware Costs		Reduce Personnel Burdens		Reduced Software and Opex Cost
expectations	Increased Availability		Dynamic Workload Management		Increase Flexibility

Scale Out Consolidation

Customer Needs: Scale Out Environments

Physical Consolidation	Compute Consolidation	Management Consolidation	Application Consolidation	Workload Consolidation

HP ProLiant DL360 G3

HP ProLiant DL560

HP ProLiant BL Portfolio

- Space constrained data center
- Multi-tiered environment
- Cable reduction
- Dynamic computing & utility computing
- Rapid deployment and re-deployment
- Simplify management (Increase servers per IT staff)
- Managing multiple data center around the world
- Increase availability / minimize costs

Controlling the Sprawl
ProLiant Blades & Essentials

BL10e

ProLiant Essentials

BL20p G2

BL40p

- **Benefits**
  - Great business flexibility
    - Rip & replace capabilities
    - Reduced hands-on management
  - Space & power requirements reduced dramatically
  - Management at its easiest

- **What's inside**
  - Ultra dense configuration
  - Low power computing
  - Remote management
  - Rapid deployment

Scale Out Scenario: Blades

HP ProLiant Blades Portfolio Solutions

Space-efficient Edge Server Blades

BL e-Class (BL10e)

- Static web server
- Utility apps *(firewall, gateway)*
- Computational cluster node

Performance Front-end & Mid-tier Server Blades

BL p-Class (BL20p, BL20p G2)

- Dynamic web / ASP hosting
- Computational cluster node
- Terminal server farm
- AV, media streaming

High Performance Back-end Server Blades

BL p-Class (BL40p)

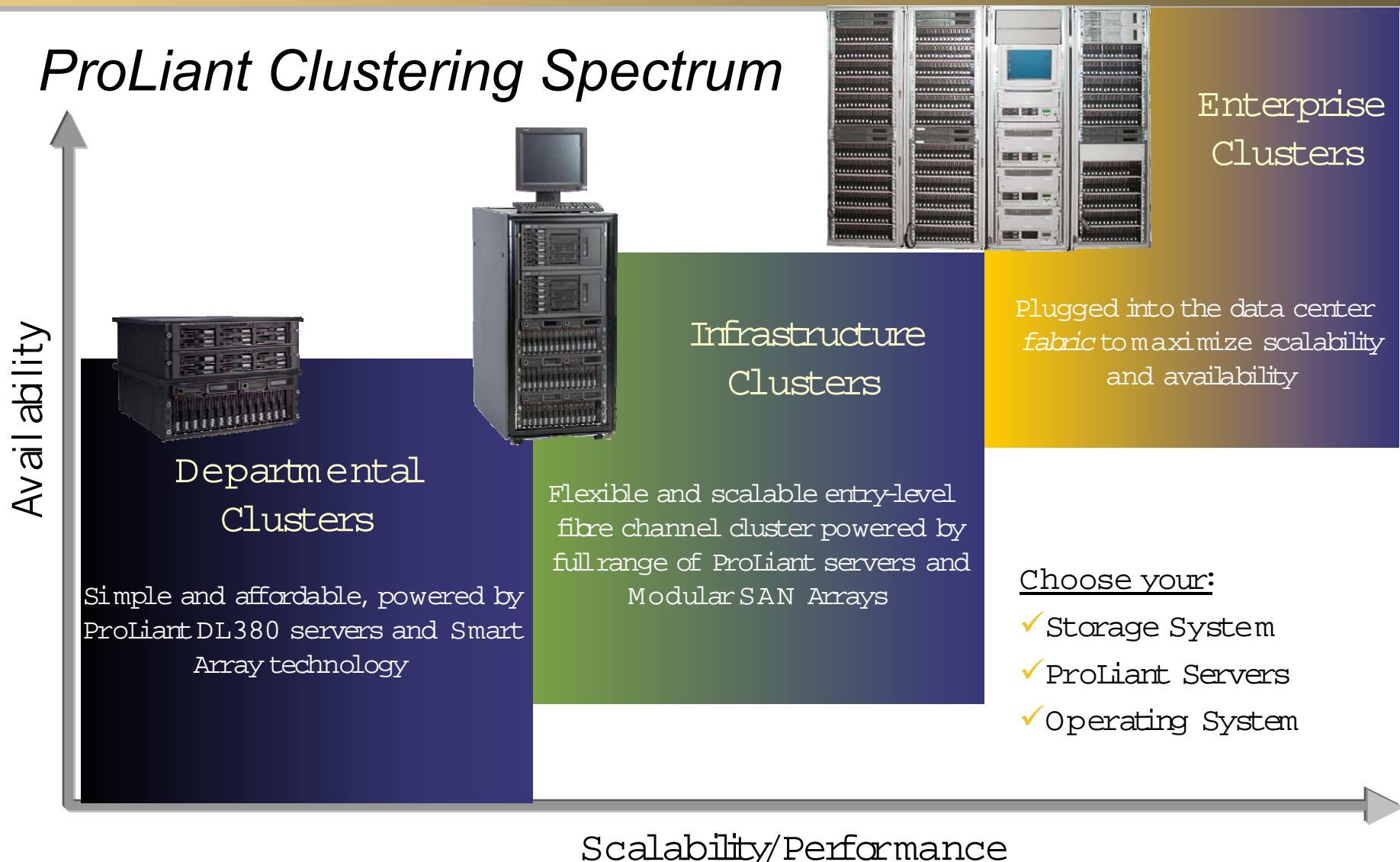- Database server
- Mail / messaging server
- HA failover cluster

Scale Out: Greater Baltimore Medical Center case study

- The Greater Baltimore Medical Center (GBMC) is a non-profit health care organization, serving 1,400 physicians, and patients in women's health, surgery, cancer, urgent/emergency care and medicine.

- Need: GBMC needed to reduce operating costs, save valuable data center space and allow for future growth. All this while improving performance, manageability and control without increasing power consumption and overloading data center resources.

- Solution: HP ProLiant BL20p blade servers and ProLiant Essentials software including the Rapid Deployment Pack

- Results:
  - Reduced infrastructure from 3 racks of servers to 1 rack of blade servers
  - Simplified server deployment and system care
  - Less power required, less heat in the data center to manage

ProLiant Clustering Spectrum

Availability (vertical axis)

Scalability/Performance (horizontal axis)

Enterprise Clusters

Plugged into the data center *fabric* to maximize scalability and availability

Infrastructure Clusters

Flexible and scalable entry-level fibre channel cluster powered by full range of ProLiant servers and Modular SAN Arrays

Departmental Clusters

Simple and affordable, powered by ProLiant DL380 servers and Smart Array technology

Choose your:
- ✓ Storage System
- ✓ ProLiant Servers
- ✓ Operating System

Scale Up Consolidation

Scale Up Scenario: N-to-1 Site Consolidation

Site 1

Datacenter 1

Site 3

Site 4

Site 2

Datacenter 2

Site N

Main

Failover
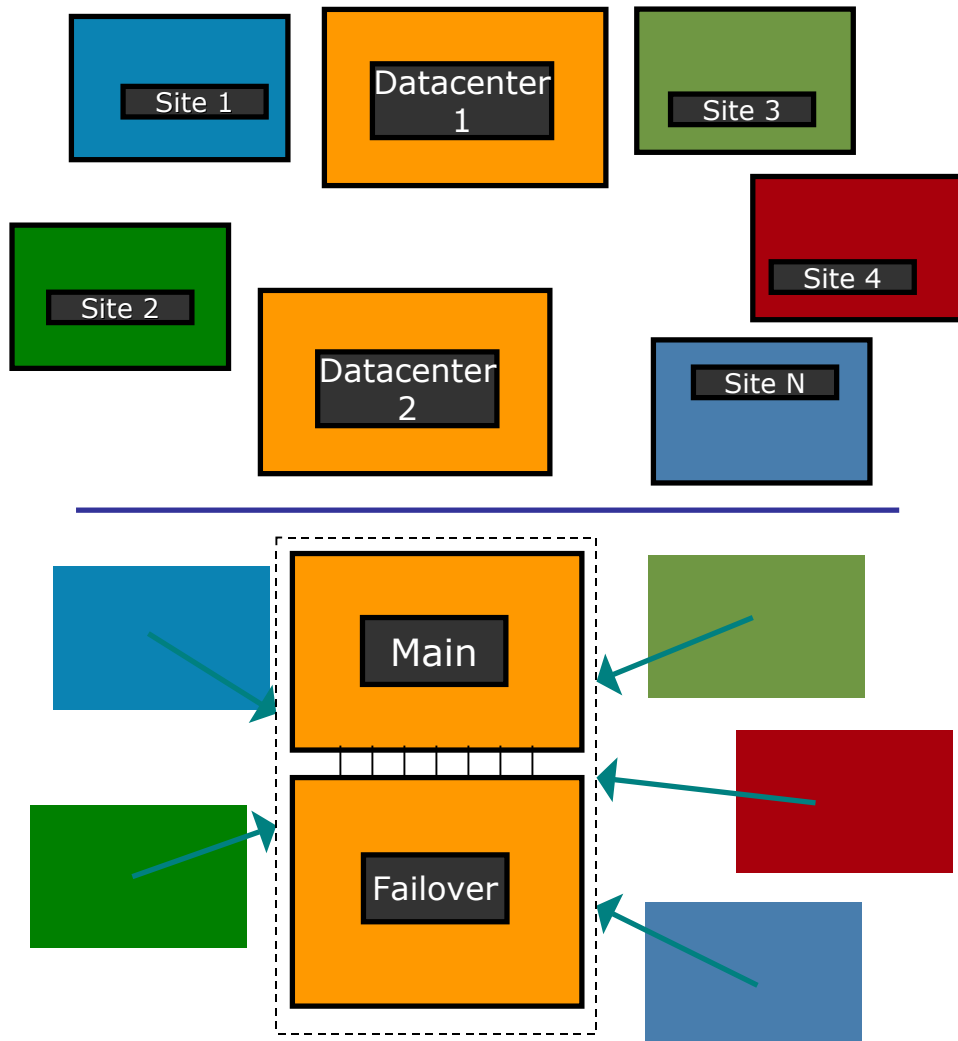
IT Challenge

- Reduce real estate costs and energy costs; allow IT staff to work more effectively; reduce management complexity

- Step 1: Consolidate multiple sites to one site….But, multiple servers still have to be managed…
- Step 2: Deploy a single point of management via clustering software
- Step 3: Implement high availability and failover with enterprise clusters
- Step 4: Add NIC teaming to protect user connections

Scale Up Scenario: Branch

Remote offices with aging server hardware

ProLiant 1600s

workload management pack

vmware™

ProLiant ML370 G3

ProLiant ML570

- Performance requirements are doubling about every 2 years
- Limited availability features relative to today's standards
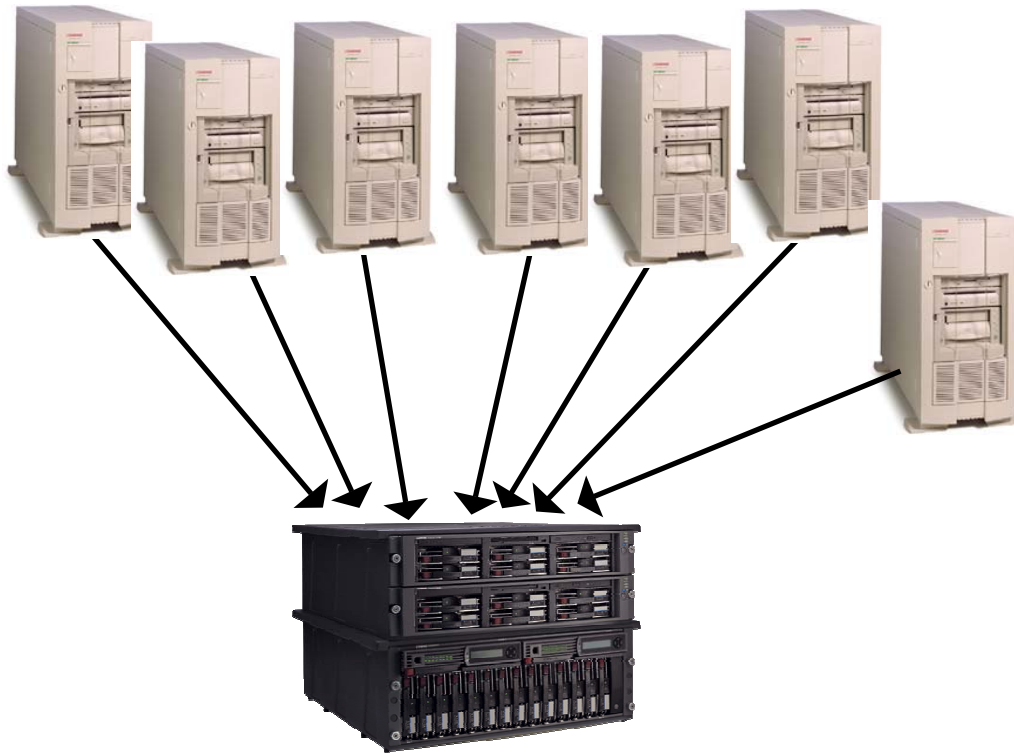- Limited manageability features

Benefits:

- Higher performance
- Dynamic Expansion
  - Hot Plus RAID memory
- More HA features
  - Hot plug power supplies
  - Hot plug fans
  - Hot plug drives
- Improved technologies reduce operational costs
  - RILOE & iLO
  - New Insight agents
  - Performance Management Pack with CIM

HP Packaged Cluster or other ProLiant Clusters

ProLiant 1600s

**ProLiant DL380
Packaged Cluster**

- **Benefits:**
  - Higher performance
  - More HA features
    - Hot plug power supplies
    - Hot plug fans
    - Hot plug drives
  - Improved intelligent manageability
  - Protects against software failures
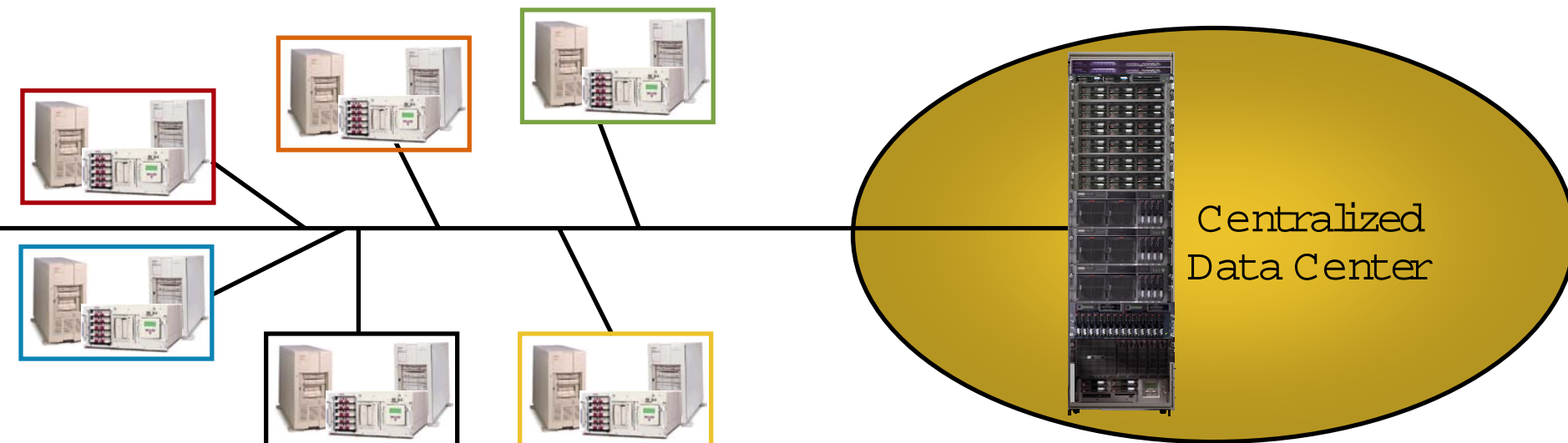 - Storage with HP MSA1000 (DAS-to SAN)

Replicated Site Consolidation Wachovia Case Study

Business Challenge

WACHOVIA

- Needed to upgrade aging ProLiant platforms at retail branch locations
- Standardized platforms
- Remote management capabilities
- Availability features to more efficiently run their line of business applications

Centralized Data Center

# Replicated Site Consolidation Wachovia Case Study

Results

- Lower TCO through remote management capabilities
- Improved availability through redundant hot-plug power supplies and drives
- Improved teller transaction efficiency
- Improved efficiencies in delivering branch data to central command center
- Ease of use by branch office standardization

WACHOVIA

Centralized Data Center
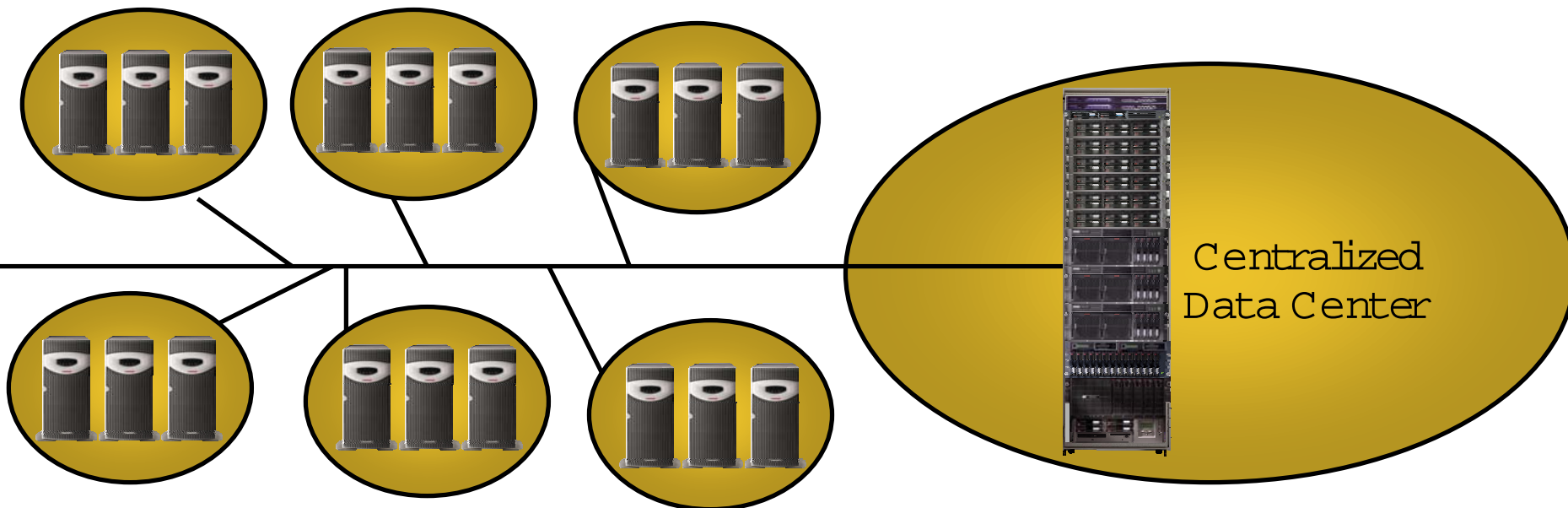
Customer Needs:
Scale Up Environments

Physical Consolidation	Compute Consolidation	Management Consolidation	Application Consolidation	Workload Consolidation

- Performance headroom

- HA design for business critical DB's and app's

- Simplify manageability

- Control costs

- Utilization of existing resources

Itanium 2 Superdome

ProLiant DL760 G2

ProLiant DL740

ProLiant DL580

ProLiant BL40p
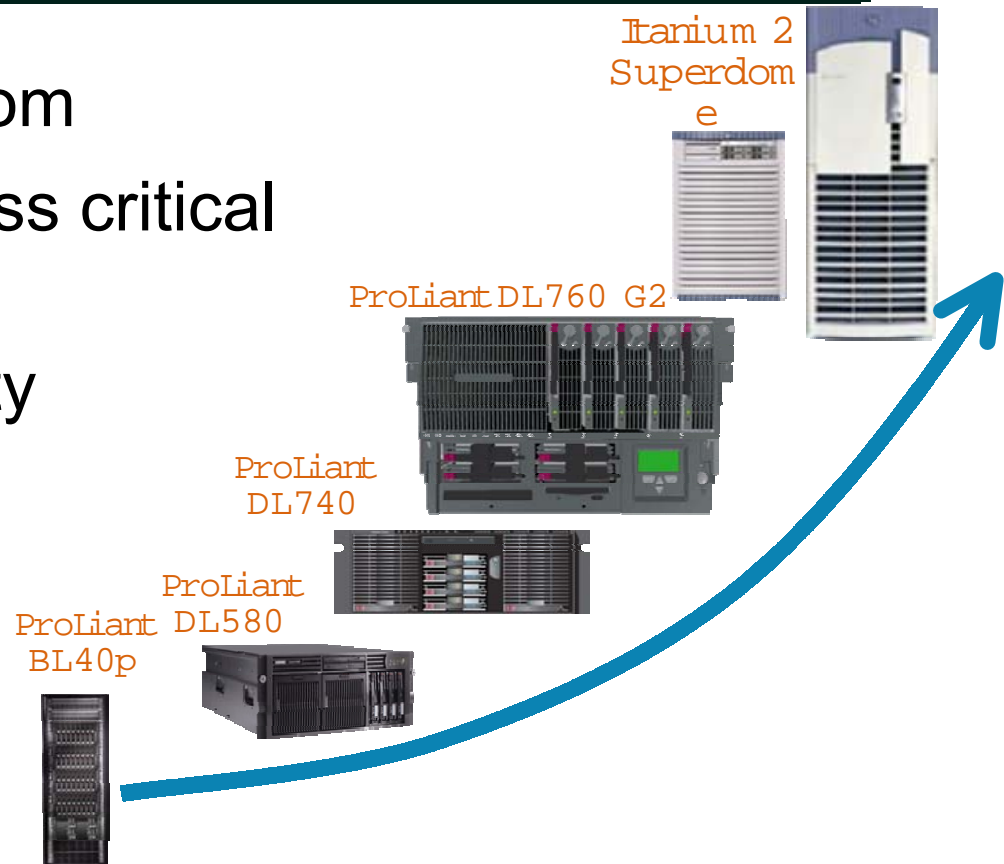
HP Partitioning Continuum ProLiant View

Multiple clustered nodes

Hard partitions

Virtual partitions

Resource partitions

Hard partitions:
- OS image with HW isolation
- OS image with HW isolation
- OS image with HW isolation

Virtual partitions:

hard partition
- OS image with SW isolation
- OS image with SW isolation
- OS image with SW isolation

Resource partitions:

1 OS image
- Application 1 with guaranteed compute resources
- Application 2 with guaranteed compute resources
- Application n with guaranteed compute resources

Based on CPUs or percentages

Consolidated workload manager (future)

| Current servers | HP Superdome and future servers | vmware™ | HP ProLiant Essentials Workload Management Pack (WMP with RPM) |

Isolation
highest degree of separation

Flexibility
highest degree of dynamic capabilities

HP Workload Management Pack

Multiple applications / single OS

Exchange	IIS	Database	Virus Scan

Workload Management Pack

Windows 2000/Job Objects
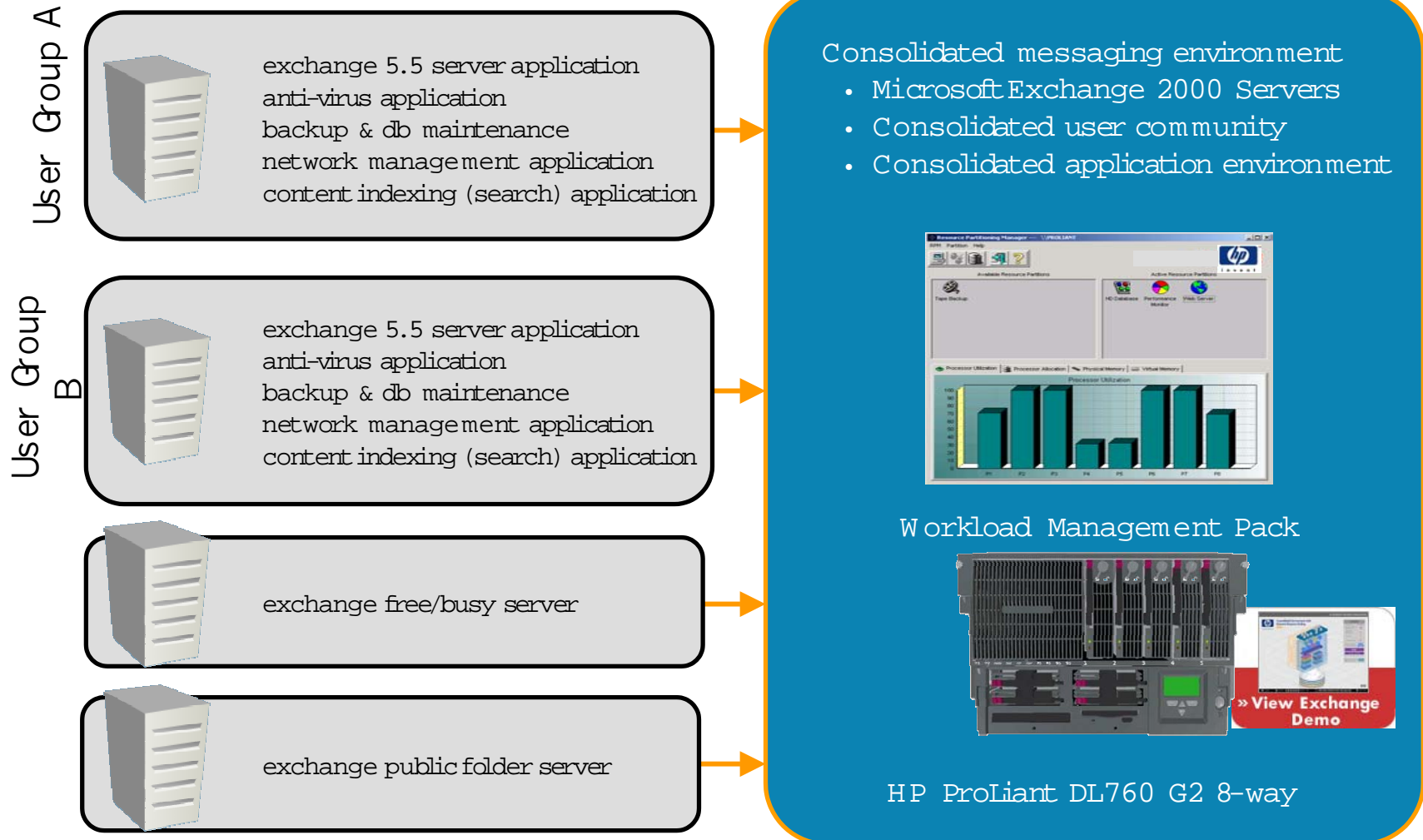
HP ProLiant DL760 G2

Key benefits

- Reduced hardware, software and maintenance costs

- Simplified management

- More cost-efficient utilization of server resources
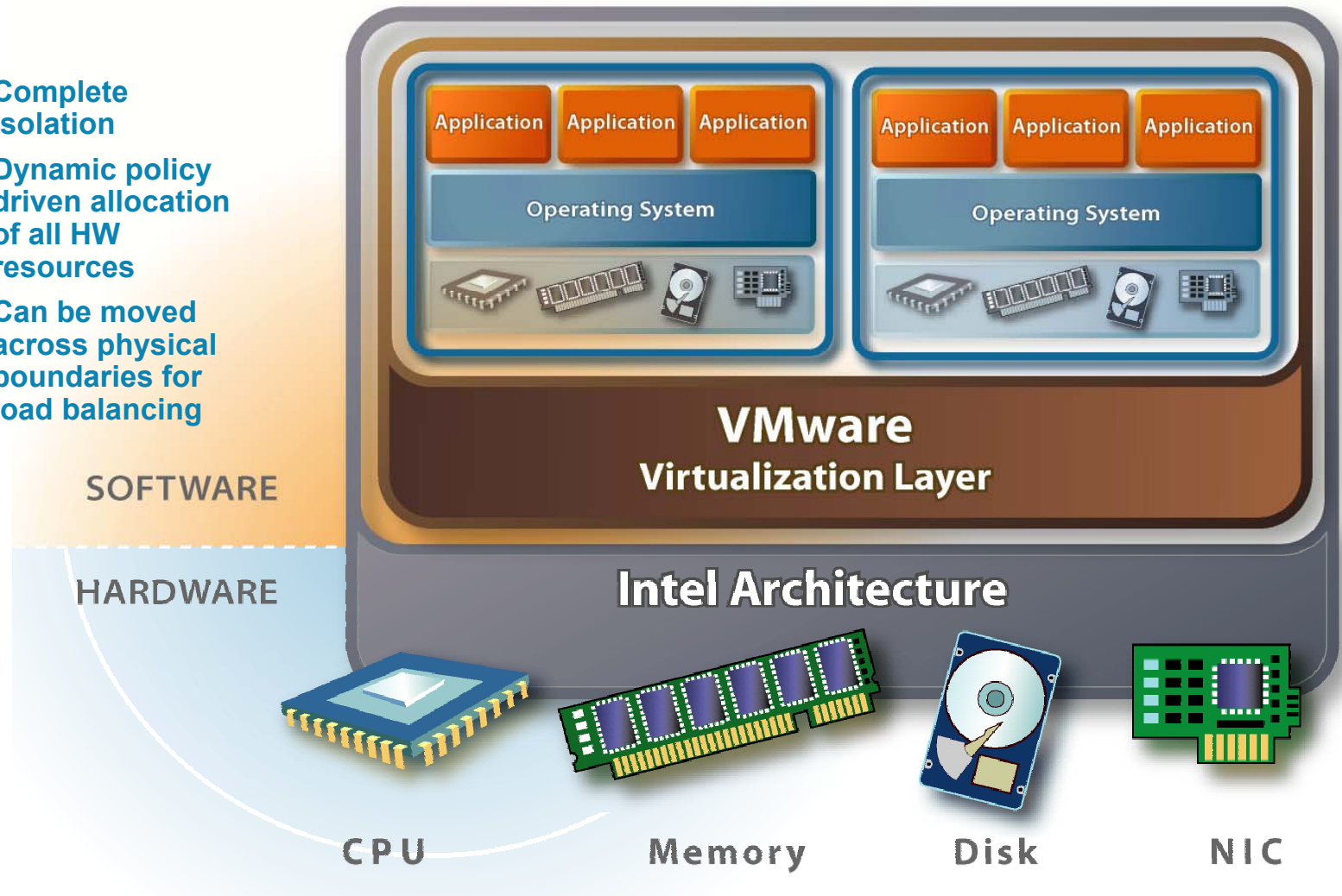
- Improved (reduced) TCO

Scale Up Scenario: Microsoft Exchange

Distributed To Consolidated Environment

User Group A

exchange 5.5 server application
anti-virus application
backup & db maintenance
network management application
content indexing (search) application

User Group B

exchange 5.5 server application
anti-virus application
backup & db maintenance
network management application
content indexing (search) application

exchange free/busy server

exchange public folder server

Consolidated messaging environment
- Microsoft Exchange 2000 Servers
- Consolidated user community
- Consolidated application environment

Workload Management Pack

» View Exchange Demo

HP ProLiant DL760 G2 8-way

VMware ESX Server
Maximized Server Infrastructure

- **Complete isolation**
- **Dynamic policy driven allocation of all HW resources**
- **Can be moved across physical boundaries for load balancing**

SOFTWARE

HARDWARE

Application Application Application

Operating System

Application Application Application

Operating System

VMware Virtualization Layer

Intel Architecture

CPU   Memory   Disk   NIC

VMware Scale Up
Virtual Servers in a Single Box

Situation

- Citrix doesn't scale well beyond 2-way machines
  - Terminal servers often for hundreds of users
  - Desire to use large machines rather many smaller ones
- Developers need multiple servers for development work
- Require multi-OS environment

Key benefits

- Management simplicity
- Reduced hardware costs
- Set up of virtual servers needs about 30 minutes
- Dynamic and partially automatic resource management

OS Instances: 4 of Linux, 5 of W2K & 2 of NT4

VMware ESX Server
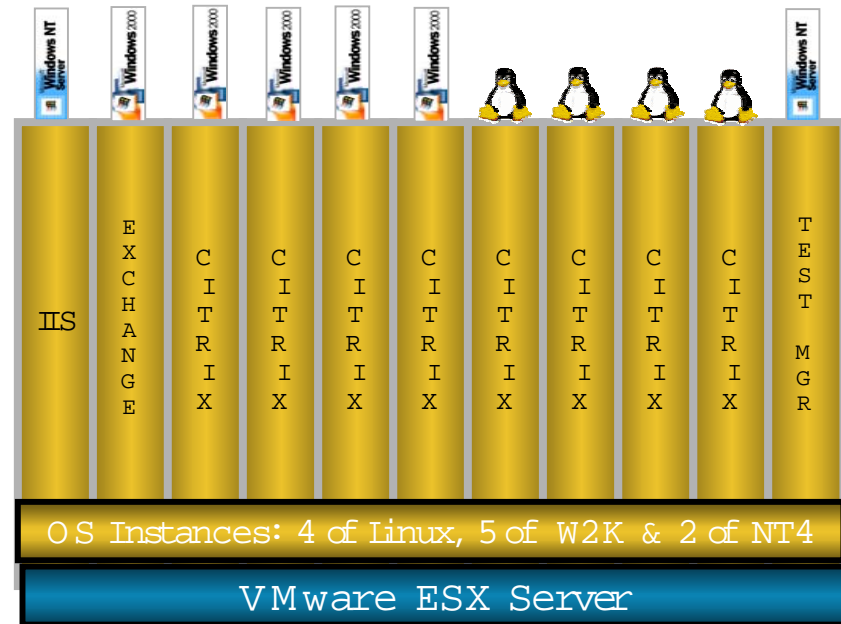
HP ProLiant
DL740 8-way

HP and VMware together: National Gypsum case study

Business Challenge

HP Adaptive Infrastructure Solution

Decrease the number of eBusiness application servers in order to: Reduce hardware, software and maintenance costs; Shrink app development and test time; Curtail management complexity.

National Gypsum used a combination of ProLiant hardware, ProLiant Essentials Software and VMware ESX server software and consolidated their **20** disparate eBusiness platforms onto **2** ProLiant 8-ways.
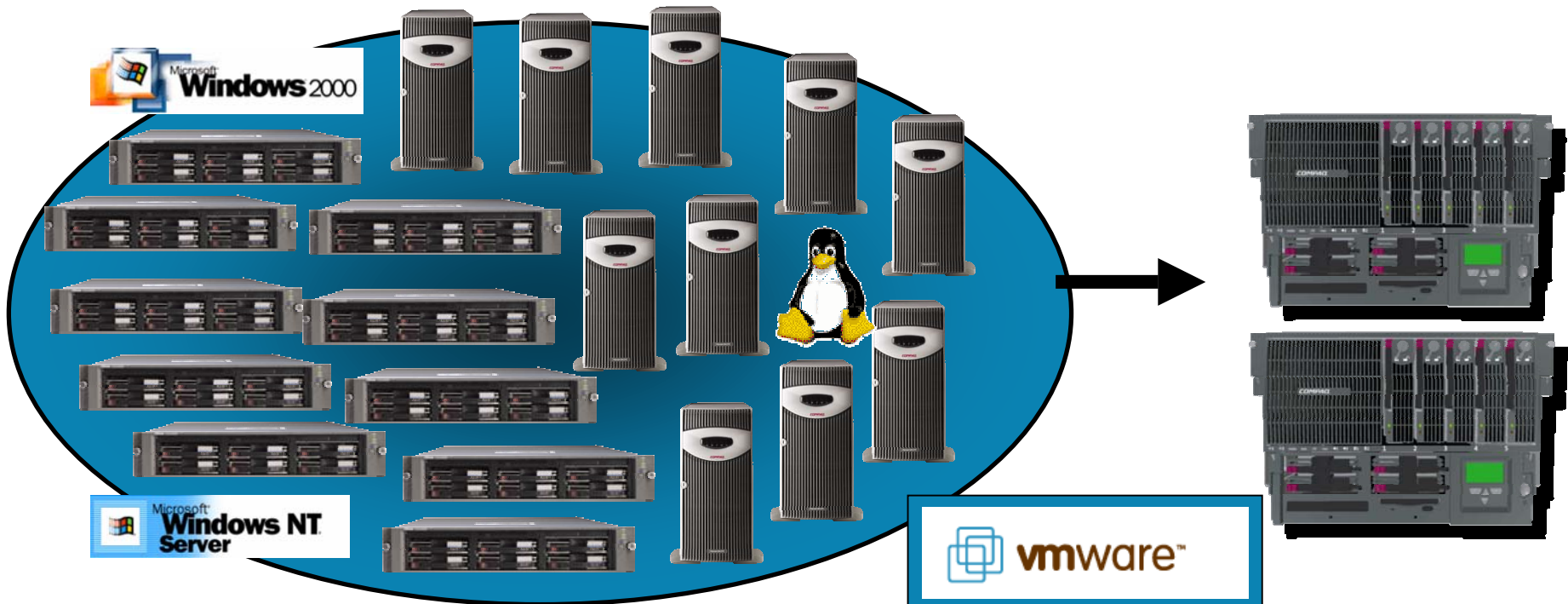
HP/VMware Partnership What's New

- HP and VMware extend partnership
- HP now provides one-stop shopping for VMware-based solutions including:
  - HP Consulting
  - HP Customer Support & Subscription Services
  - VMware software
  - Industry-standard HP ProLiant servers
  - HP StorageWorks
- HP can now offer VMware ESX Server, GSX Server, Workstation and HP-branded services for Microsoft Windows and Linux operating systems and associated applications running in VMware virtual machines
- HP customers will have the ability to set up a single point for support through the HP portfolio of service contracts
- HP has more servers certified on VMware than any other vendor

- May 28, 2003 announcement

# VMware Control Center Virtual Resource Management

Coming Soon

- What is it? – You can manage distributed, heterogeneous computing environments as a single pool of hardware resources.

- Control Center includes:
  - **Centralized Management Console:** manage virtual machines, virtual machine groups and virtual disk images from a central interface
  - **Virtual Machine Dashboard:** monitor virtual machine performance and availability across all physical servers, modify resource allocations and migrate virtual machines across hosts based on utilization profiles
  - **Server Provisioning:** simplify server provisioning by managing a repository of hardware-independent virtual machine templates & wizard-based deployment of new servers
  - **Secure Access Management:** secure access to key pieces of VMware Control Center by individual virtual machine physical server

- Second beta to open in August – general release later in year

- Contact your HP sales representative for details or visit:
  - http://www.vmware.com/products/cc_features.html

Scale Up: ProLiant & Windows Server 2003

Developed on HP platforms; 4.7M seats on Windows 2000
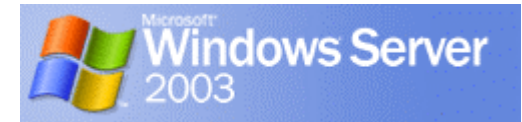
- Strong case for file server consolidation
- Combination of hardware advancement & software improvements
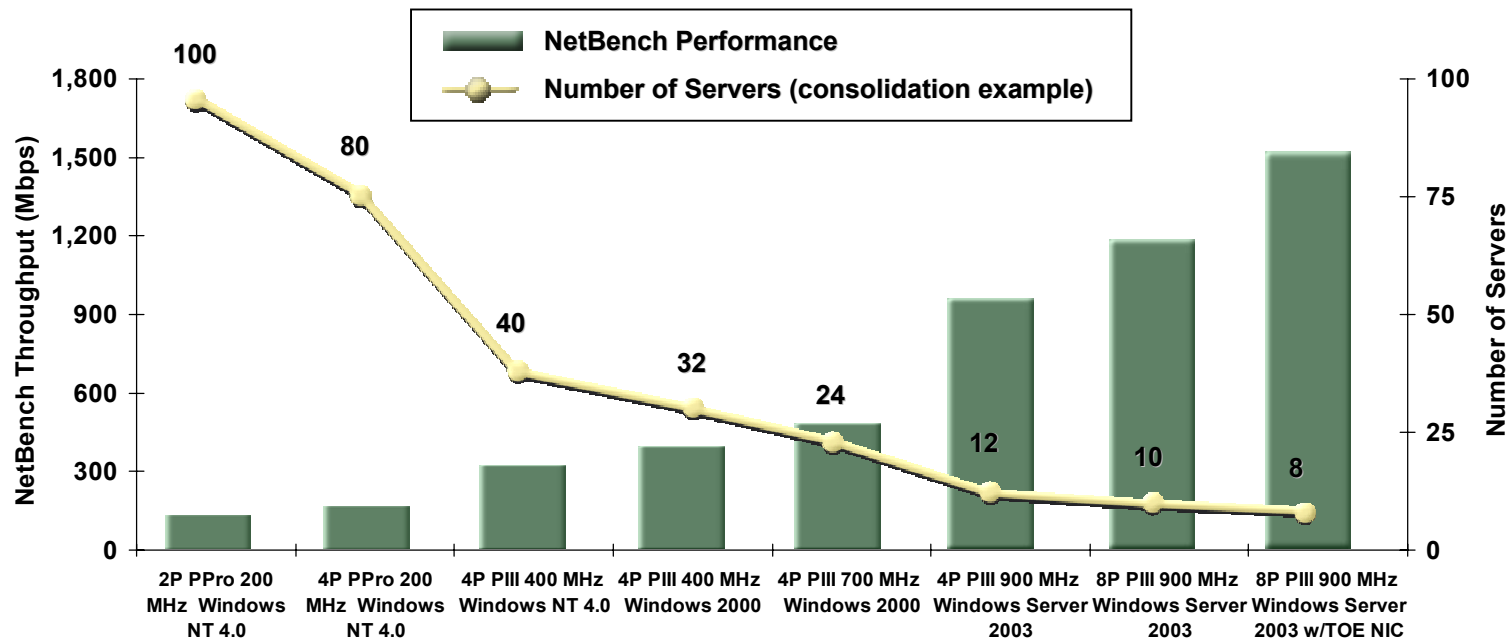
Scale Up: Itanium®2 and Database Consolidation

- **Triggers for Itanium®2 consideration**
  - Large Data Sets (> than 1TB)
  - Memory-intensive apps (> than 4GB)
  - Floating point intensive apps
  - Port/migrate 64-bit applications from a proprietary platform?
  - Deploy multiple operating systems for investment protection

- **Database considerations**
  - "Headroom for the future"
    - Scalability above 32-bit limits
    - World-class 64-bit performance
  - Database server reduction
    - Scenario 1 - Partitioning for multiple SQL DBs on single OS images
    - Scenario 2 – Workload management of multiple SQL DBs on a single OS image

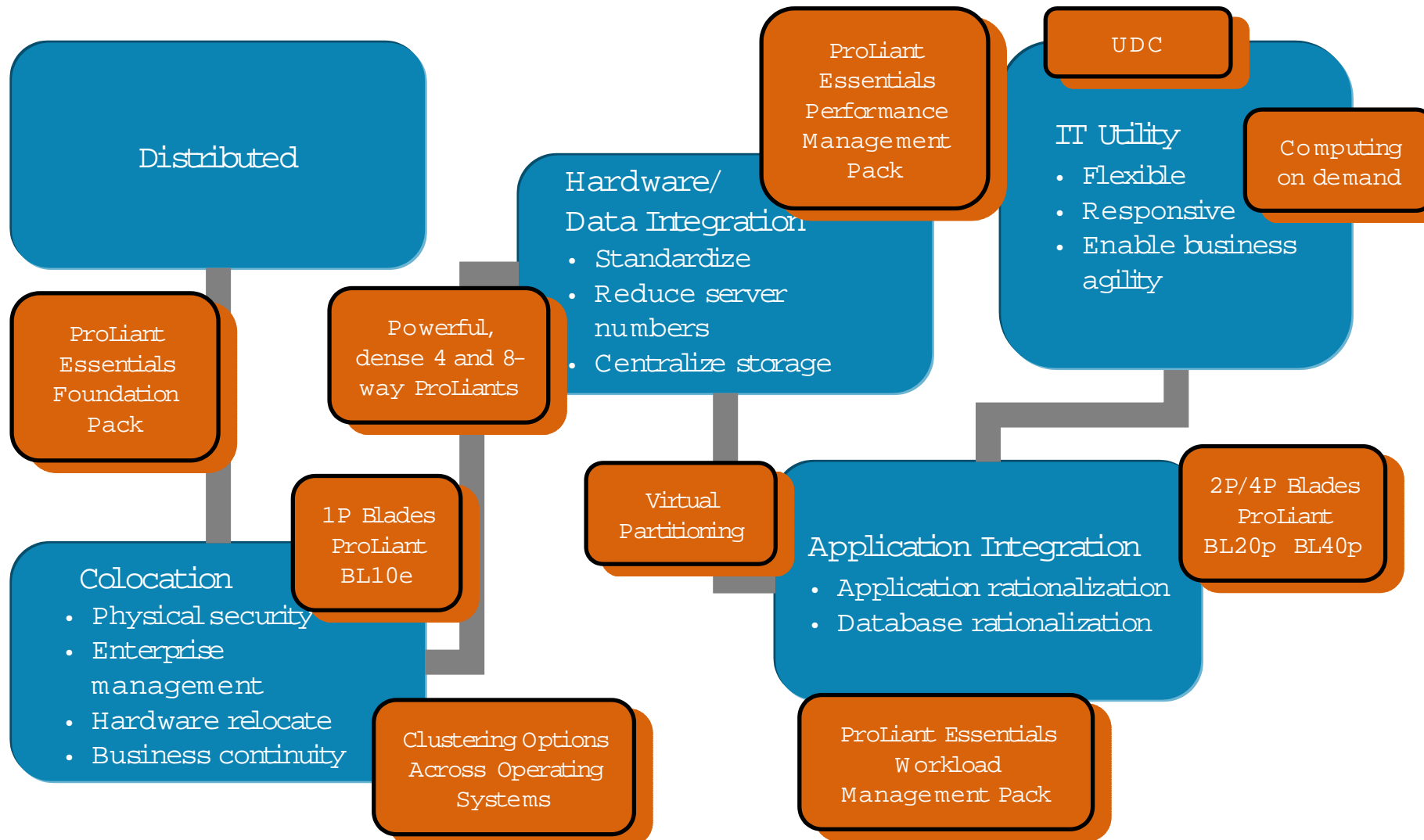hp-ux 11i — ERP, SCM, Oracle, Billing, Data Warehousing, …

Microsoft Windows Advanced Server Limited Edition — E-mail and file serving, front-end app serving

Linux — Web serving, firewalls, load-balancing

ITANIUM 2

HP IT Consolidation Journey—
Enablers for Industry Standard computing

Distributed

ProLiant Essentials Foundation Pack

Powerful, dense 4 and 8-way ProLiants

Hardware/ Data Integration
- Standardize
- Reduce server numbers
- Centralize storage

ProLiant Essentials Performance Management Pack

UDC

IT Utility
- Flexible
- Responsive
- Enable business agility

Computing on demand

1P Blades ProLiant BL10e

Virtual Partitioning

Application Integration
- Application rationalization
- Database rationalization

2P/4P Blades ProLiant BL20p BL40p

Colocation
- Physical security
- Enterprise management
- Hardware relocate
- Business continuity

Clustering Options Across Operating Systems

ProLiant Essentials Workload Management Pack

Key ProLiant differentiators for consolidation

- **Market leadership**
  - Agile technology enables customer flexibility
  - Management capabilities
  - Worldwide share leadership

- **ProLiant Essentials**
  - Valuable tools
  - Unique integration with OpenView

- **Solutions & Services**
  - Key development and GTM partnerships
  - Solutions knowledge for heterogeneous environment
  - On-line tools, sizers, best practice guides

Additional Resources

- Other HP World Sessions of Interest:
  - Session #2187: ProLiant Clusters: A Product Line Overview
  - Session #2194: Quantifying the Value of Blade Systems
  - Session #2203: ProLiant Essential Performance Management Pack: Resolving ProLiant Server Performance Issues
  - Session #2205: VMware/MS Virtual Server Technical Overview
  - Session #2262: VMware—How do I Get Started?
  - Session #1515: Server Consolidation: Best practices for mixing workloads on servers
  - Session #2296: Windows Server Consolidation Using Virtual Machines
  - Session #1360: IT Consolidation Design Considerations
  - Session #1516: Best Practices for consolidating SQL 2000 Servers with Windows
- HP ProLiant Consolidation
  - http://www.hp.com/servers/proliant/consolidation
- HP IT Consolidation Overall
  - http://h71028.www7.hp.com/enterprise/html/4197-0-0-0-121.html
- How to reach us at HP
  - http://welcome.hp.com/country/us/eng/contact_us.html

Interex, Encompass and HP bring you a powerful new HP World.