Common Blade Solutions
for the Adaptive Enterprise
2195

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HP WORLD 2003
Solutions and Technology Conference & Expo

Agenda

- Overview of ProLiant Blade Systems

- Blades within a Multi-tiered Internet Architecture – best practices

- Solution Architectures – typical configurations

- Blade Solutions at HP world

ProLiant BL multi-tiered portfolio

edge server blades

BL e-Class (BL10e)

static web server

infrastructure apps

(firewall, gateway, security, DNS, DHCP)

computational cluster node

2P performance front & mid-tier server blades
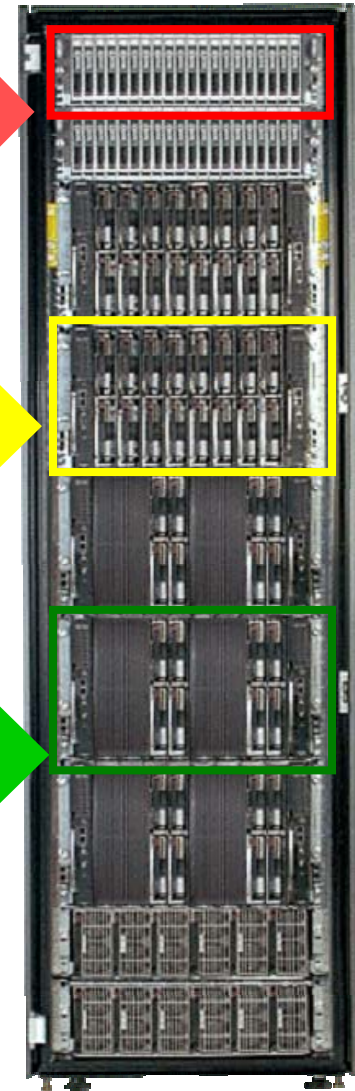
BL p-Class (BL20p, BL20p G2)

dynamic web / ASP hosting

computational cluster node

terminal server farm

AV, media streaming

4P performance back-end server blades

BL p-Class (BL40p)

database server

mail / messaging server

HA failover cluster

Customer needs
drive a new server architecture...

- Comprehensive portfolio
  - power-efficient front-end blades
  - mid-tier performance blades
  - high performance back-end blades
- Rapid serviceability and continuous uptime
  - rapid deployment and redeployment tools
  - hardware and software
- Centralized management
  - servers, networking and applications
  - intelligent power and provisioning management
  - Centrally manage your data center 1 blade or '000s … anywhere…anytime
- Investment protection
  - mix with "legacy" servers and storage
  - longevity of architecture and interconnects
  - rack compatibility: ProLiant, 3rd party, Telco interconnects

TCO impacts across the lifecycle

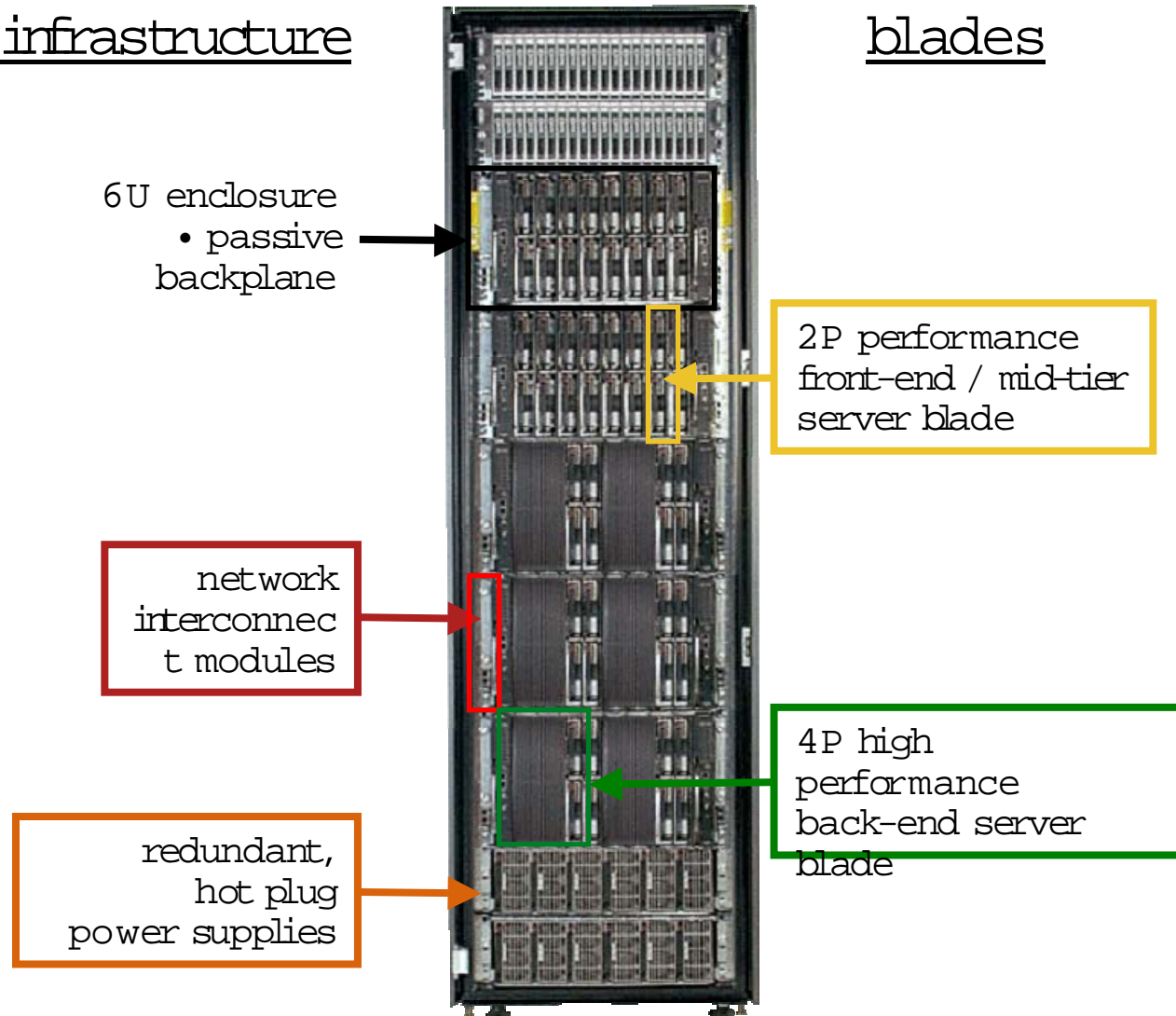| Lifecycle stage	TCO impact of blades
Acquisition	Pay as you go – adding additional blades is less expensive than adding additional rack mounted servers; upgrade and replacement blades are also less costly
Planning	Blades require upfront planning, but pay off quickly in terms of savings for installing and managing new and redeployed blades
Deployment and provisioning	Hardware deployment is simple – plug blades into enclosure; Software deployment can be automated, image or script-based
Maintenance	Fewer service errors due to more streamlined modular architecture; Higher availability due to fewer components per server (i.e. power)
Upgrades and replacements	With software provisioning tools, upgrades and replacements are simply plug and play (no re-cabling)
Re-provisioning	Re-provisioning is a drag-and-drop event – this saves time and resources while maximizing hardware utilization

Blades promote standardization of hardware/software building blocks to lower TCO throughout lifecycle

ProLiant BL p-Class

anatomy

<u>infrastructure</u>

<u>blades</u>

6U enclosure
* passive backplane

2P performance front-end / mid-tier server blade

network interconnect modules

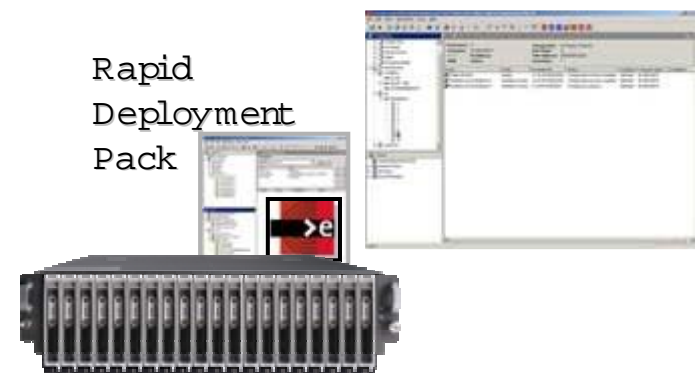4P high performance back-end server blade

redundant, hot plug power supplies

Essential System Software
to Provision Blade System Components

Network & Storage Provisioning

Server Deployment & Provisioning
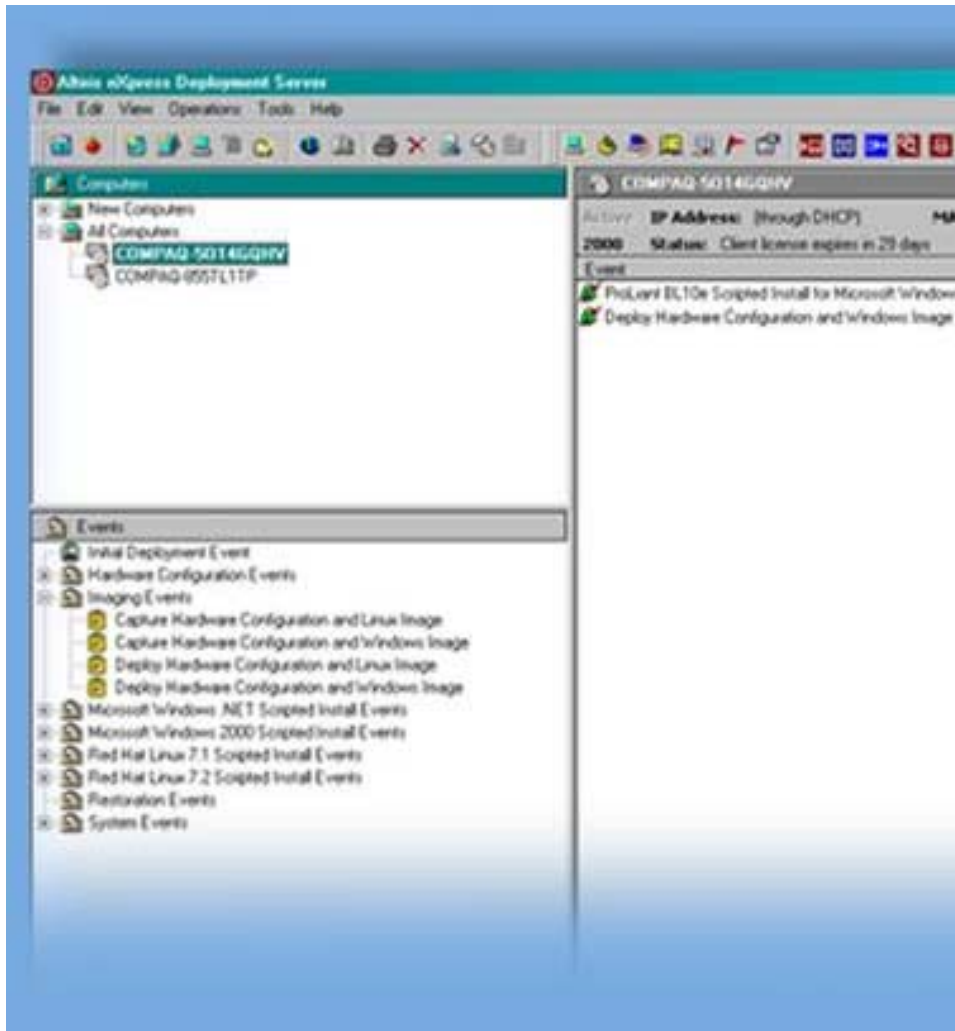
Rapid Deployment Pack

Local and Remote Server Management

Element Management – Insight Manager 7

iLO

Service Level Management – OpenView

ProLiant Essentials
Rapid Deployment Pack

What is Rapid Deployment Pack?

- GUI, console-based deployment server
- **Drag-and-drop** servers into configurations
- Built-in pxe services and pxe image tools
- Network booting for **headless deployment**
- Deploy via **scripting or imaging**
- Built in script generation and editing
- **Remote power control** through wake-on-LAN, riloe or integrated lights-out

Blade Optimizations

- **Rip-and-Replace** for easy serviceability
- **Grouping of blade servers** in the console by physical location of rack/enclosure/bay
- **Advanced automated policies** to preconfigure virtual rack/enclosure/bay (future feature)

Rapid Deployment Pack

server farm

new server

1

2

3

new server is added

automatically...
hardware, OS,
and applications
are landed!

note: rip and replace
support for blade servers
!

image of
hardware, OS,
and application
is captured

Install brand new
service provider-
hosted MS Exchange
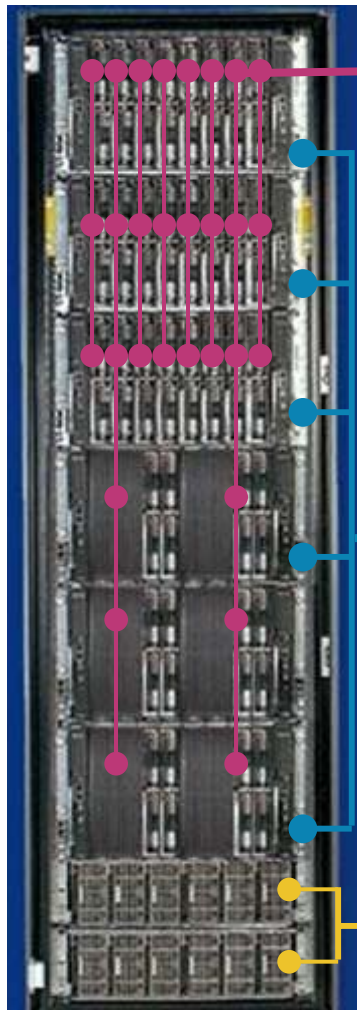to small businesses in
only...

32 hours, a 65%
reduction from 92
hours
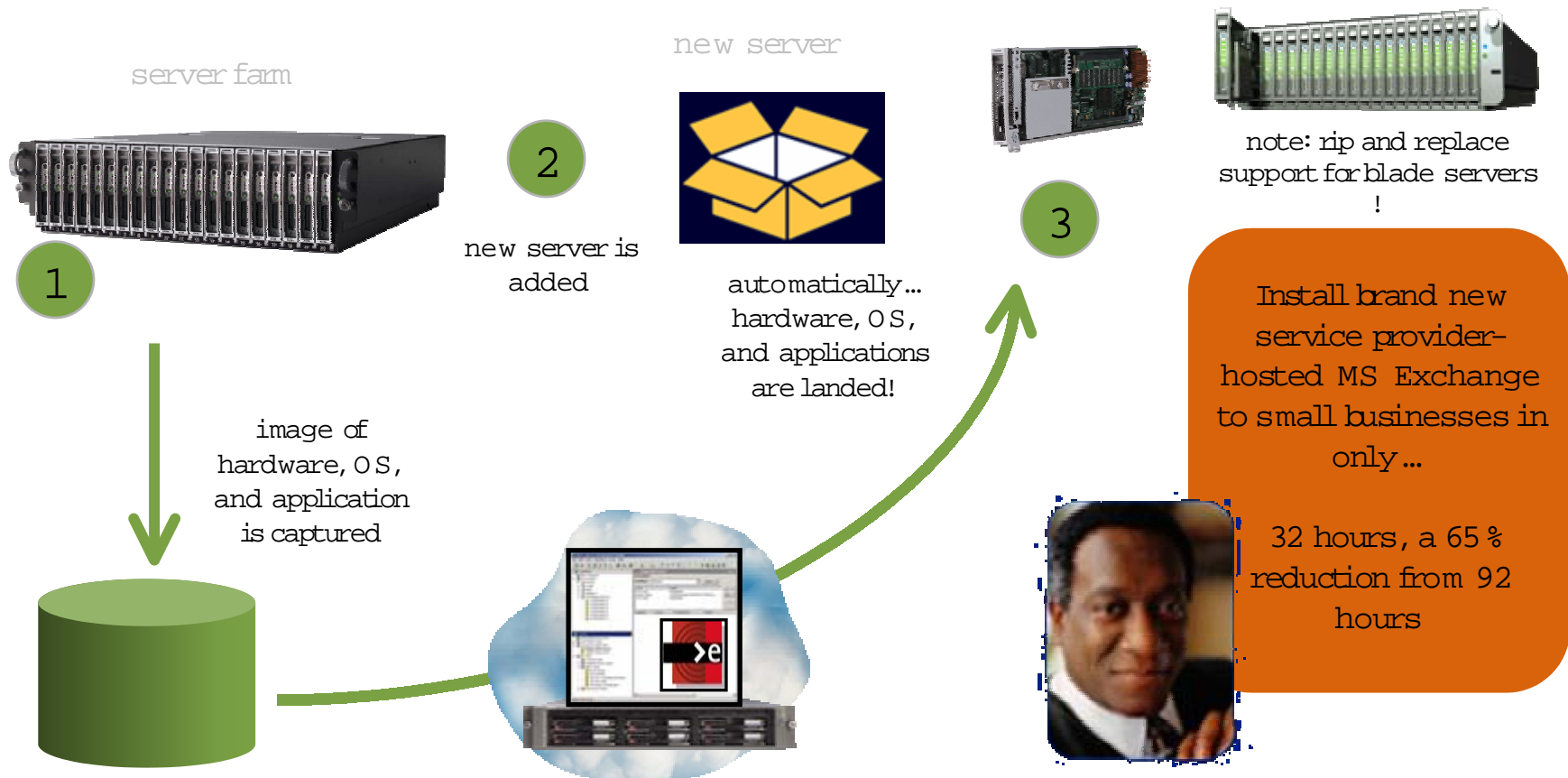
lifecycle deployment solution for multi-server installations
automates resource intensive deployment processes

Intelligent Rack Infrastructure

Integrated Lights-Out Advanced
throughout Architecture

Insight Manager 7
visualization and control

p-Class blades
- Remote console & media
- OS independent
- 'always on'
- Secure (SSH) connection

chassis & interconnect
- environmental monitoring
- blade presence
- interconnect activity

power
- management and alerts
- capacity and budgeting

Container Information

Rack Name:	ICERack1
Enclosure Name:	Enclosure1
Slot Number:	7
Server Dimensions:	44mm x 267mm x 711mm

LEGEND:
- Server
- Current server
- Interconnect
- Power supply enclosure

HP Blade Server Alliance Program

enabling the solution ecosystem

Broad ISV interest and support for ProLiant BL blade systems

redhat   PolyServe   f5   altiris   Microsoft   CiTRIX

bea   SuSE   V-ONE   CHECK POINT Software Technologies Ltd.   vmware

only a sample of partners

Program elements:

- Tested and verified application configurations

- Opportunities for joint marketing awareness and sales engagement

- Opportunities to integrate with unique HP blade, blade infrastructure and software capabilities (e.g. virtual presence; automated deployment; server, storage and service-level management, etc.)

Blades within a Multi-tiered Internet Architecture

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Blade systems: integration of servers, network, and storage

firewall/VPN

load balancer

L2 VLAN switch

web servers
ProLiant DL360s

L2 VLAN switch

clustered database servers
ProLiant DL580s
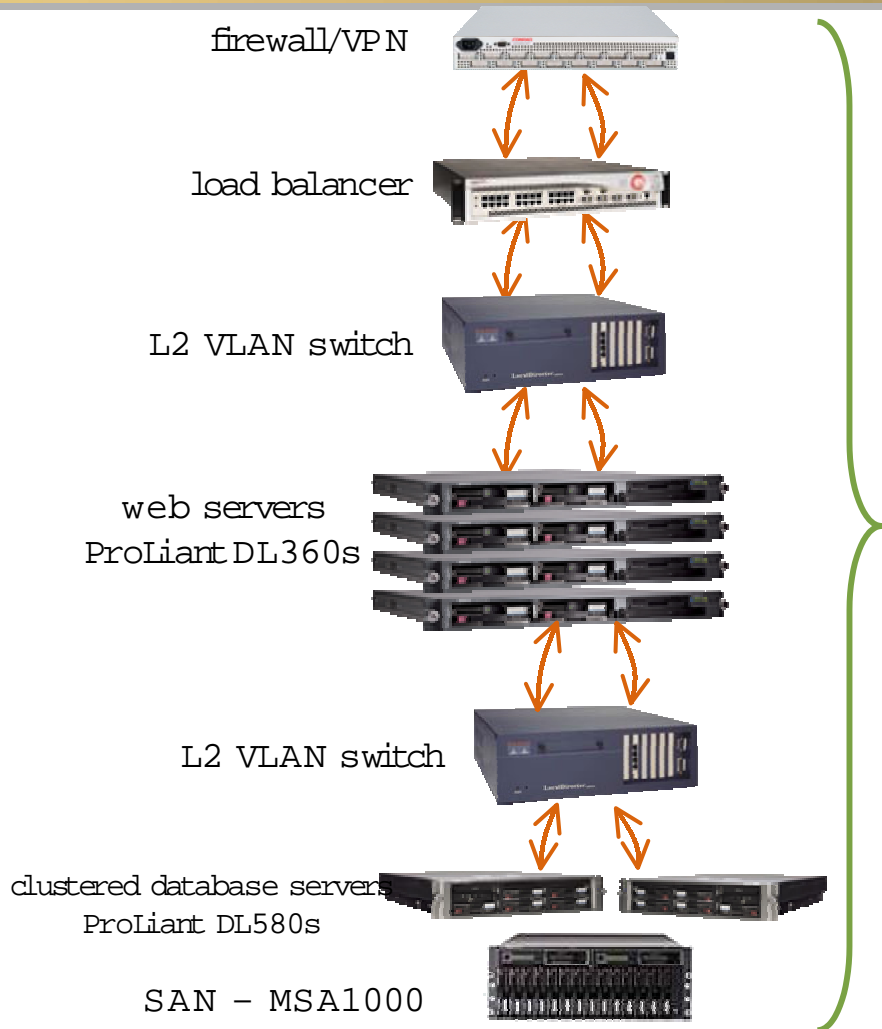
SAN – MSA1000

ProLiant BL10e

L2 VLAN switch

ProLiant BL20p
ProLiant BL40p

L2 VLAN switch

BL p-Class Power

Management Servers

SAN MSA1000

rack-mounted server architecture

blade system architecture

Best Practices

- Use blade disks for O/S, applications, and paging

- Use "shared storage" for user and application data

- Take advantage of the blade management tools (software deployment, monitoring, & provisioning) for maximum ROI & lowest TCO

- Use Blade systems as a "catalyst" for improving datacenter efficiency *(note: a blade TCO model is available from your HP sales representative)*

Usages & Solutions

- infrastructure applications

- internet applications

- enterprise applications

Infrastructure Applications

- load balancing (F5 Networks, Zeus)
- traffic management (F5 Networks)
- firewalls (Checkpoint, V-One)
- management & monitoring (Insight Manager, OpenView, Microsoft MOM, NetIQ, etc.)
- VPN (Checkpoint, V-One)
- security (Intrusion detection, anti-virus, etc.)
- provisioning (UDC, Corosoft, Consera, Sychron, etc.)
- software deployment (ProLiant Rapid Deployment Pack)
- wireless mobility (Blackberry, Extended Systems, Microsoft MIS & Windows 2003)
- partitioning (WMP, VMware)
- DNS, DHCP, etc.

Web & Infrastructure Front-Ends: BL e-class

firewall/VPN

load balancer

L2 VLAN switch

web servers   ProLiant DL

Firewall / VPN

Load balancers

Anti-virus

DNS, DHCP, etc.

web servers

L2 VLAN switches
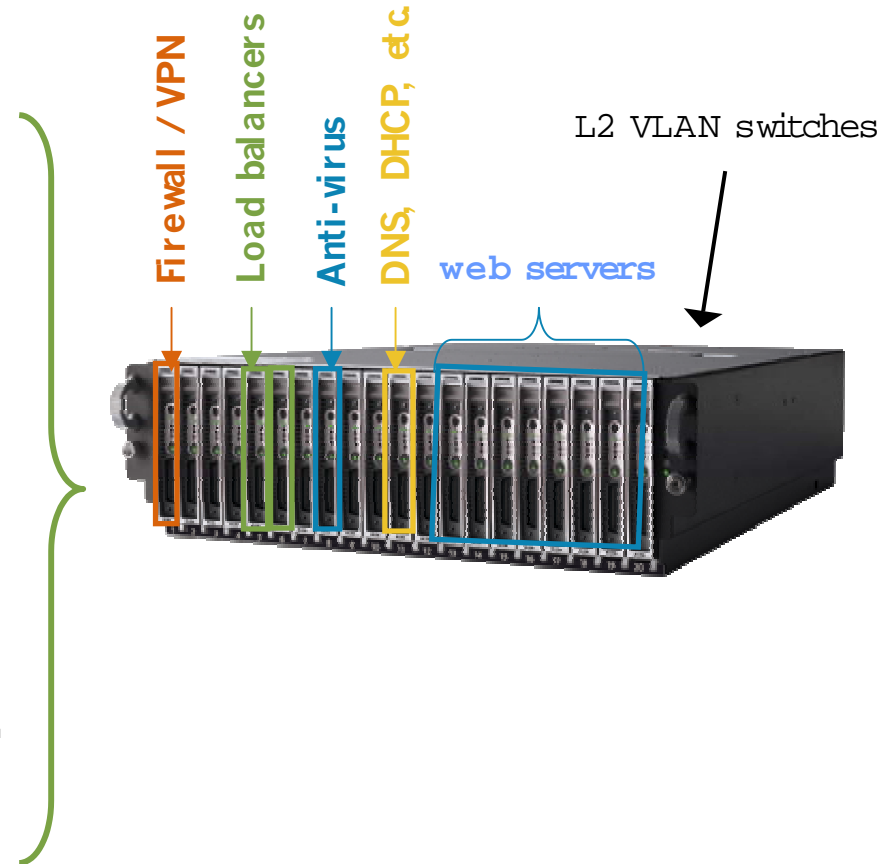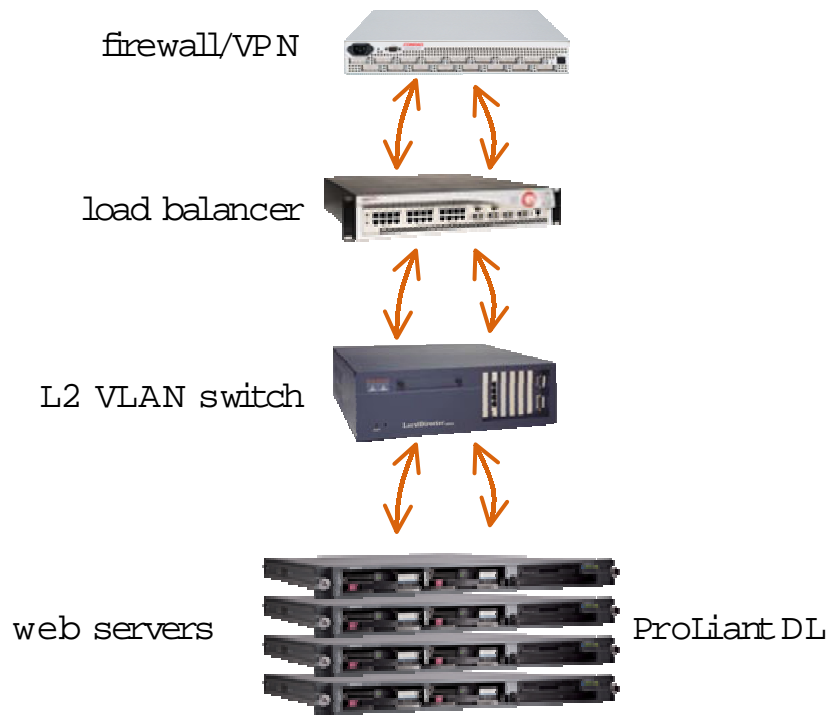
rack-mounted server architecture

blade server enclosure

Internet Applications

- Windows web hosting
- Linux web hosting
- Trading partner enablement
- Microsoft solution for Internet business
  - Internet Presence
  - Internet Commerce (B2C, B2B and multi-channel e-commerce)
  - Enterprise Content Portals (intranet and extranet portals)
  - Enterprise Content Management
- Streaming Media
- Linux Sendmail
- Portal solutions

Web Hosting and Web Services Application of ProLiant Blade Servers

Internet

Dialup

ProLiant BL10e
VPN Server

ProLiant BL10e
ISA Firewall

ProLiant BL10e Management Server
& Integration & Deployment Sever

ProLiant BL10e
F5 Load Balancer

Management
Console

ProLiant
BL10e

ProLiant
BL10e

ProLiant
BL10e

ProLiant
BL10e

BL Switch

ProLiant BL10e
F5 Load Balancer

ProLiant BL20p
BizTalk

Wireless iPAQ
Access Monitor

ProLiant
BL20p

ProLiant
BL20p

ProLiant
BL20p

ProLiant BL20p
ISA Firewall
For Internet /
External Web
Services

BL Switch

**Management
Network
Segment**

Active-Active Cluster

ProLiant BL40p

ProLiant BL40p

SecurePath 3.1B, If
Desired

Modular SAN Array 1000

| Access Clients |
| Firewall Microsoft ISA |
| F5 Load Balancer on a BL10e blade |
| Web Site and Application Center |
| **BizTalk Server for process integration** |
| Application Servers Running .NET Web Services |
| ProLiant Servers Windows Clusters w/SQL Server |
| ProLiant Storage Works, Storage Area Networks and Storage Management Software |

E-Commerce Storefront Example Application of ProLiant BL Servers

Dialup

ProLiant BL20p

VPN

Internet

Access Clients

ProLiant BL20p ISA Firewall

Firewall Microsoft ISA

Management LAN Segment

ProLiant BL20p
Rapid Deployment Sever & Insight manager 7

BL Switch

Microsoft Windows Load Balanced

ProLiant BL20p

ProLiant BL20p

ProLiant BL20p

ProLiant BL20p

Windows 2000 & IIS Commerce Server and Application Center

Management Console

BL Switch

BL Switch

ProLiant BL20p

BizTalk Server for B2B biz integration

Wireless iPAQ Access Monitor

Active-Active Cluster

Catalog & Search

ProLiant BL40p

Marketing, Admin Server, UPM & Data Warehouse

ProLiant BL40p

ProLiant BL40p

Transactions

ProLiant Servers Windows Clusters w/ SQL Server

Modular SAN Array 1000

Modular SAN Array 1000

ProLiant Storage Works, Storage Area Networks and Storage Management Software

ProLiant BL10e Servers with Windows Media 4

Internet

Access Clients

ProLiant Essentials
Deployment Server

ProLiant
DL360 G2

Management
Console

ProLiant BL
Switch

ProLiant
BL10e

Microsoft ISA
Firewall

ProLiant
BL10e

F5
Load Balancer

ProLiant BL10e
Media Servers

Windows Media Services
for Windows 2000 Server
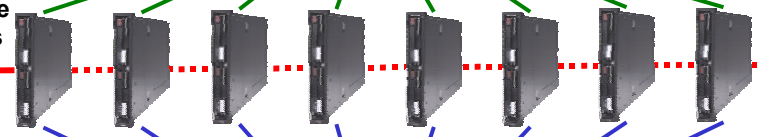
10/100 Switch

Management
LAN Segment

COMPAQ
iPAQ Pocket PC

Wireless ProLiant
Access Monitor

ProLiant BL
Switch

StorageWorks NAS
b2000

Media File Storage
500 GB

ProLiant BL20p Servers with Windows Media 9

Internet

Access Clients

ProLiant BL20p

Microsoft ISA Firewall

ProLiant Essentials Deployment Server

ProLiant DL380 G2

Management Console

BL switch option

ProLiant BL20p

F5 Load Balancer

ProLiant BL20p Media Servers

Windows Media Services for Windows .NET Server

10/100 Switch

Management LAN Segment

BL switch option

COMPAQ
iPAQ Pocket PC

StorageWorks NAS b2000

Media File Storage 500 GB to 9 TB

Wireless ProLiant Access Monitor
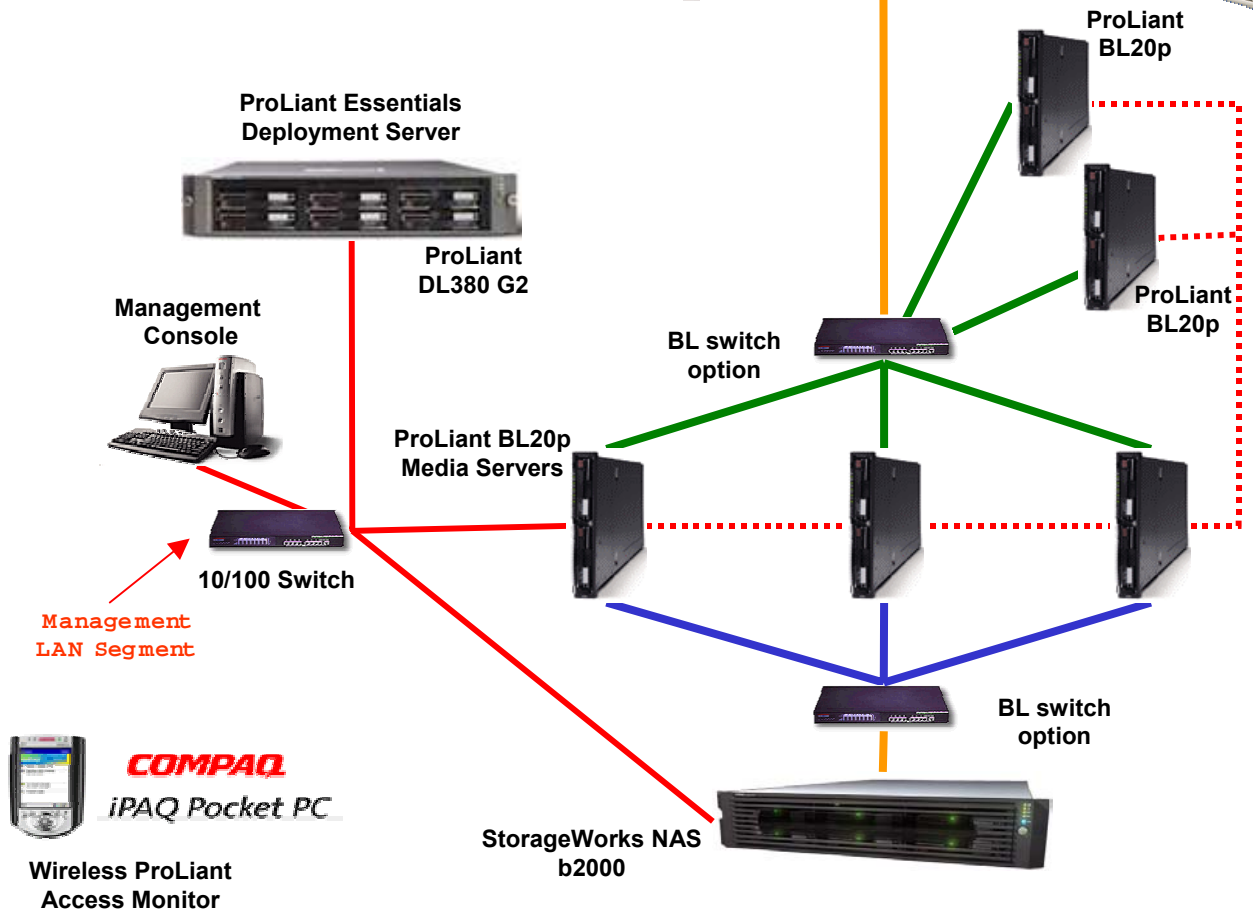
Enterprise Applications

- enterprise applications
  - SAP
  - Siebel
  - PeopleSoft
  - JD Edwards
  - Microsoft Exchange
  - Lotus Domino
  - Legacy applications

- Citrix thin client solutions

- BEA WebLogic Application Server

- Other industry specific applications (financial, manufacturing, telecommunications, education, distribution, retail, etc.)

Citrix Server-Based Computing Application of ProLiant Blade Servers

CITRIX

Internet

Access Clients

ProLiant BL20p
VPN Server

DHCP Server

ProLiant BL20p

ProLiant BL20p

Dialup

DNS Server

ProLiant BL20p
Management Server
& Integration & Deployment Sever

Firewall, Web Servers, NFUSE Servers, and/or MetaFrame XP Servers (1 to N Servers)

ProLiant BL10e

Management
Console

BL Switch

Citrix MetaFrame XP Load Balanced Server Farm (1 to N Servers)

Wireless iPAQ
Access Monitor

ProLiant
BL20pG2

**Management
Network
Segment**

BL Switch

Citrix MetaFrame XP Data Store ProLiant Servers w/ SQL Server

ProLiant BL40P

ProLiant BL40P

ProLiant Storage Works, Storage Area Networks and Storage Management Software

Modular SAN Array 1000

Modular SAN Array 1000

SAP R/3 Sample Blade Configuration using ProLiant Servers

SAP

Various SAP Clients

Middle-Tier Application Servers
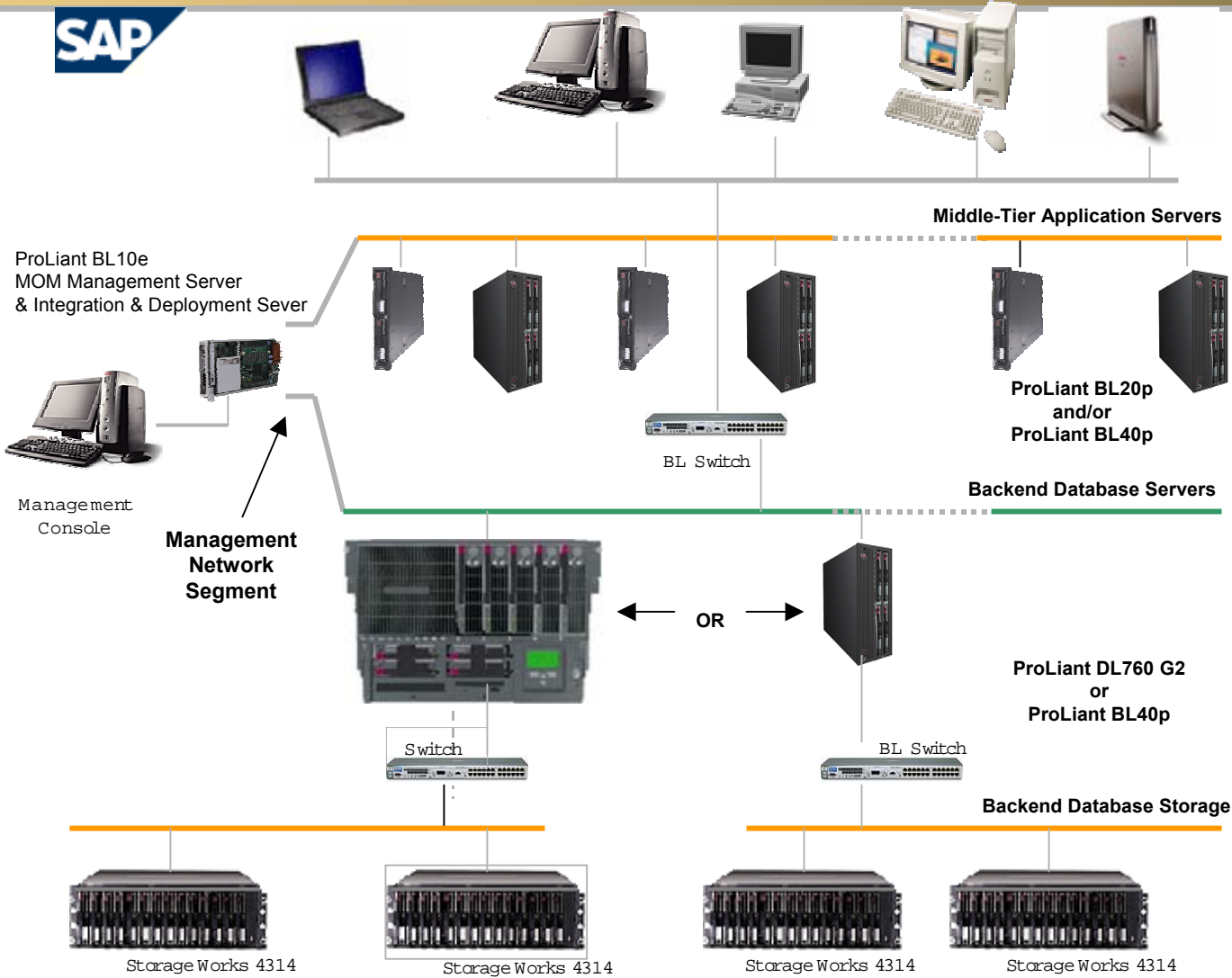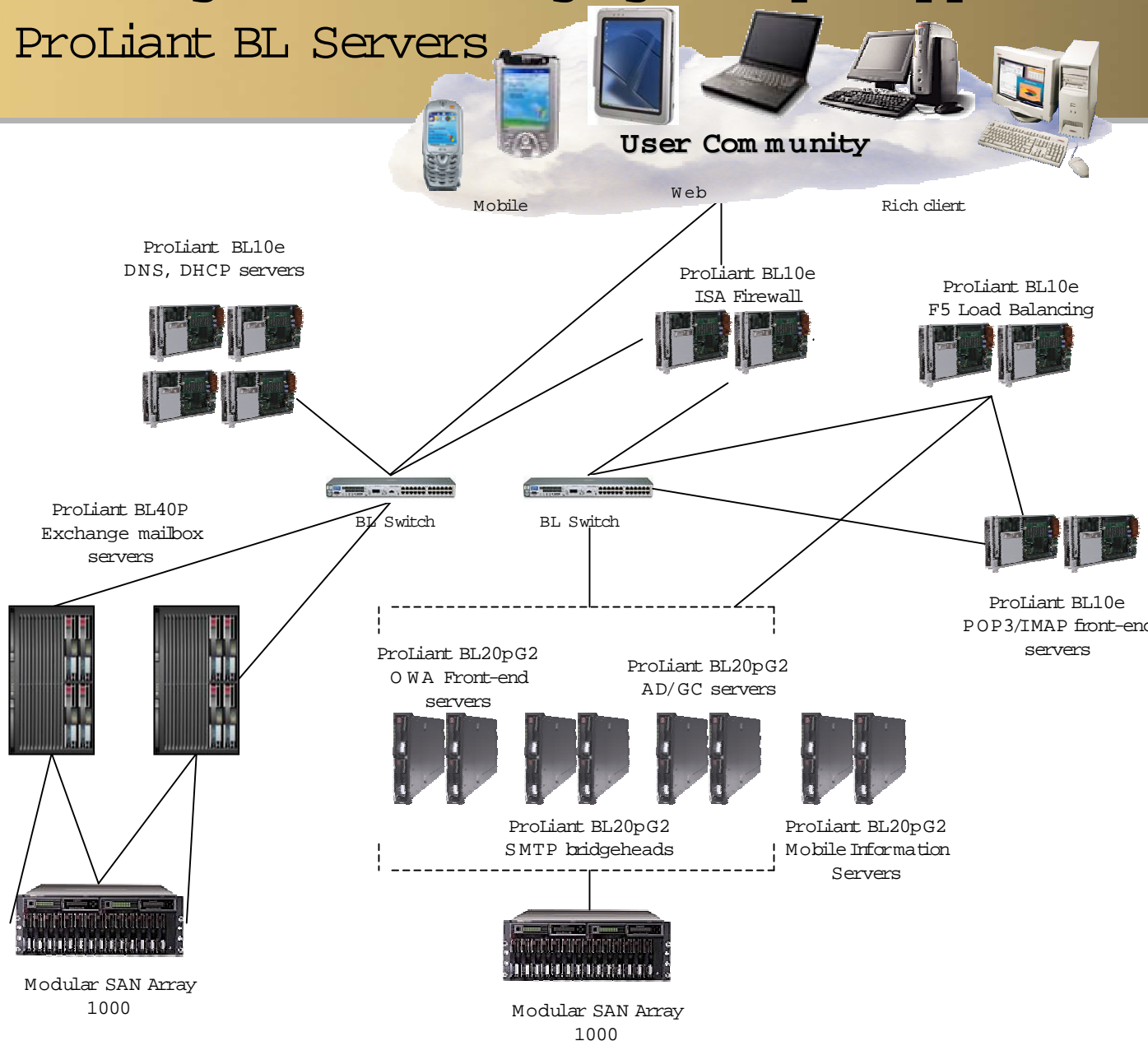
Multiple ProLiant BL20p and/or ProLiant BL40p Servers Provide a Highly Scalable Middle-Tier for SAP Web Application Servers

ProLiant BL10e
MOM Management Server
& Integration & Deployment Sever

ProLiant BL20p
and/or
ProLiant BL40p

BL Switch

Management Console

Management Network Segment

Backend Database Servers

Backend Database Server using a Single ProLiant DL760 G2 or ProLiant BL40p Server

OR

ProLiant DL760 G2
or
ProLiant BL40p

Switch

BL Switch

Backend Database Storage

Easily Expandable Database Storage based on ProLiant StorageWorks

Storage Works 4314

Storage Works 4314

Storage Works 4314

Storage Works 4314

Exchange 2000 Messaging Example Application of ProLiant BL Servers

User Community

Mobile   Web   Rich client

ProLiant BL10e
DNS, DHCP servers

ProLiant BL10e
ISA Firewall

ProLiant BL10e
F5 Load Balancing

ProLiant BL40P
Exchange mailbox
servers

BL Switch   BL Switch

ProLiant BL10e
POP3/IMAP front-end
servers

ProLiant BL20pG2
OWA Front-end
servers

ProLiant BL20pG2
AD/GC servers

ProLiant BL20pG2
SMTP bridgeheads

ProLiant BL20pG2
Mobile Information
Servers

Modular SAN Array
1000

Modular SAN Array
1000

The Entire Exchange 2000 Messaging Solution (with Mobility)

BL10e Servers

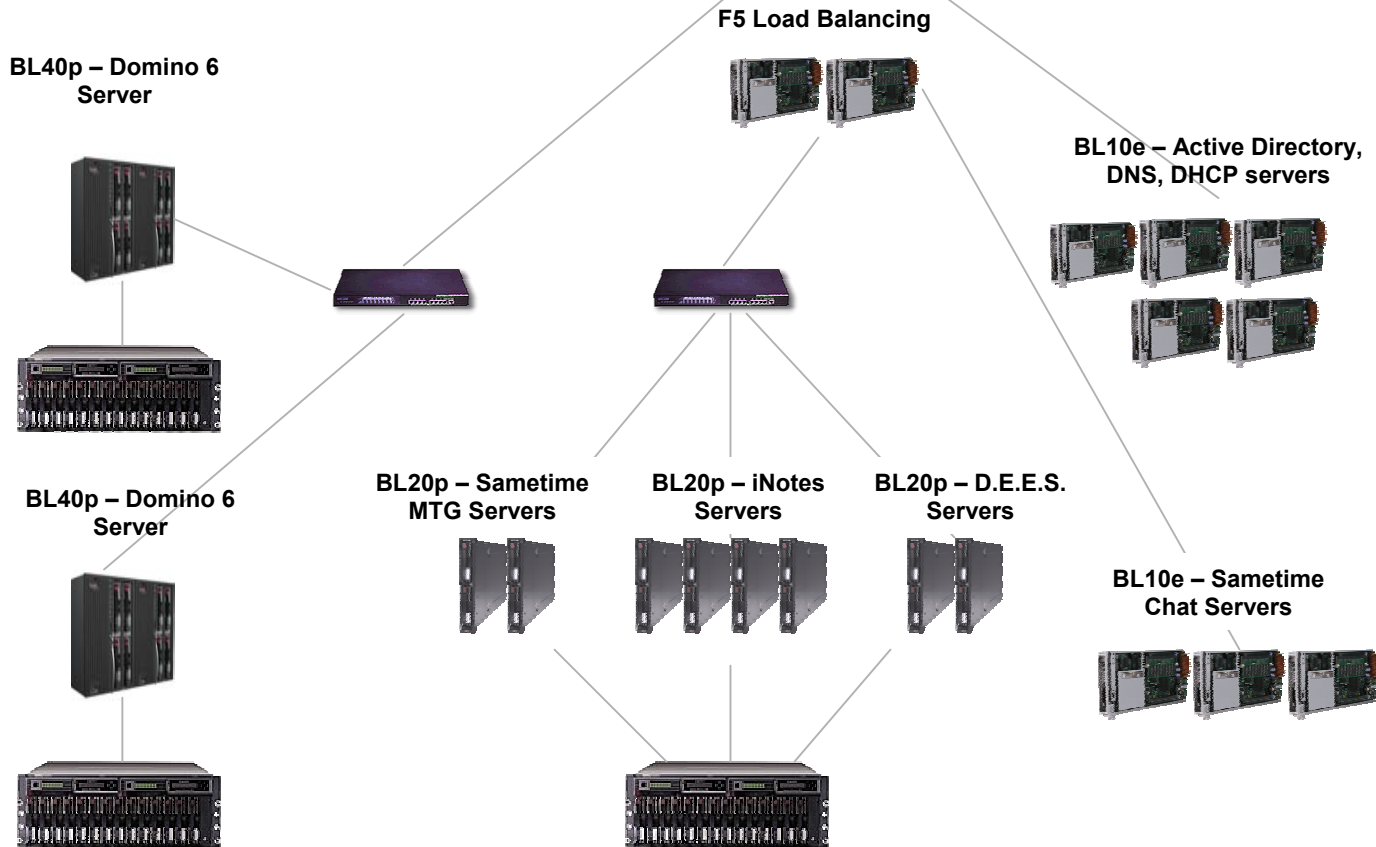• **Load Balancing**

• **POP3/IMAP FE Servers**

• **ISA Firewall**

• **Infrastructure**

BL20p Servers

• **Outlook Web Access**

• **MMIS mobile access**

• **SMTP Bridgeheads**

• **Active Directory / GC**

BL40p Servers

• **Exchange 2000 mailbox servers**

Lotus Messaging Example Application of ProLiant BL Servers

User Community

Mobile

Web

Rich client

F5 Load Balancing

BL40p – Domino 6 Server

BL10e – Active Directory, DNS, DHCP servers

BL40p – Domino 6 Server

BL20p – Sametime MTG Servers

BL20p – iNotes Servers

BL20p – D.E.E.S. Servers

BL10e – Sametime Chat Servers

The Entire Lotus Messaging Solution

BL10e Servers

• **Load Balancing**

• **Sametime Chat Servers**

• **Infrastructure**

BL20p Servers

• **iNotes Web Access**

• **Sametime MTG Servers**

• **D.E.E.S Handheld Access**

BL40p Servers

• **Domino 6 Full Client Access**

Oracle Application Server Sample Configuration using ProLiant Server Blades for Windows and Linux

ORACLE

Various Oracle Clients

ProLiant BL10e
MOM Management Server
& Integration & Deployment Sever

Middle-Tier Application servers

ProLiant B20p Servers Provide a Highly Scalable Middle-Tier for Oracle 11i Application Servers

ProLiant B20p

BL Switch

Management Console

Management Network Segment

Backend Database Servers

Backend Oracle 9i Real Application Clustered Database using 2 or more ProLiant BL40p servers

Fibre Switch

ProLiant BL40p

Backend Database Storage

Easily Expandable Oracle 9i Database Storage based on ProLiant StorageWorks
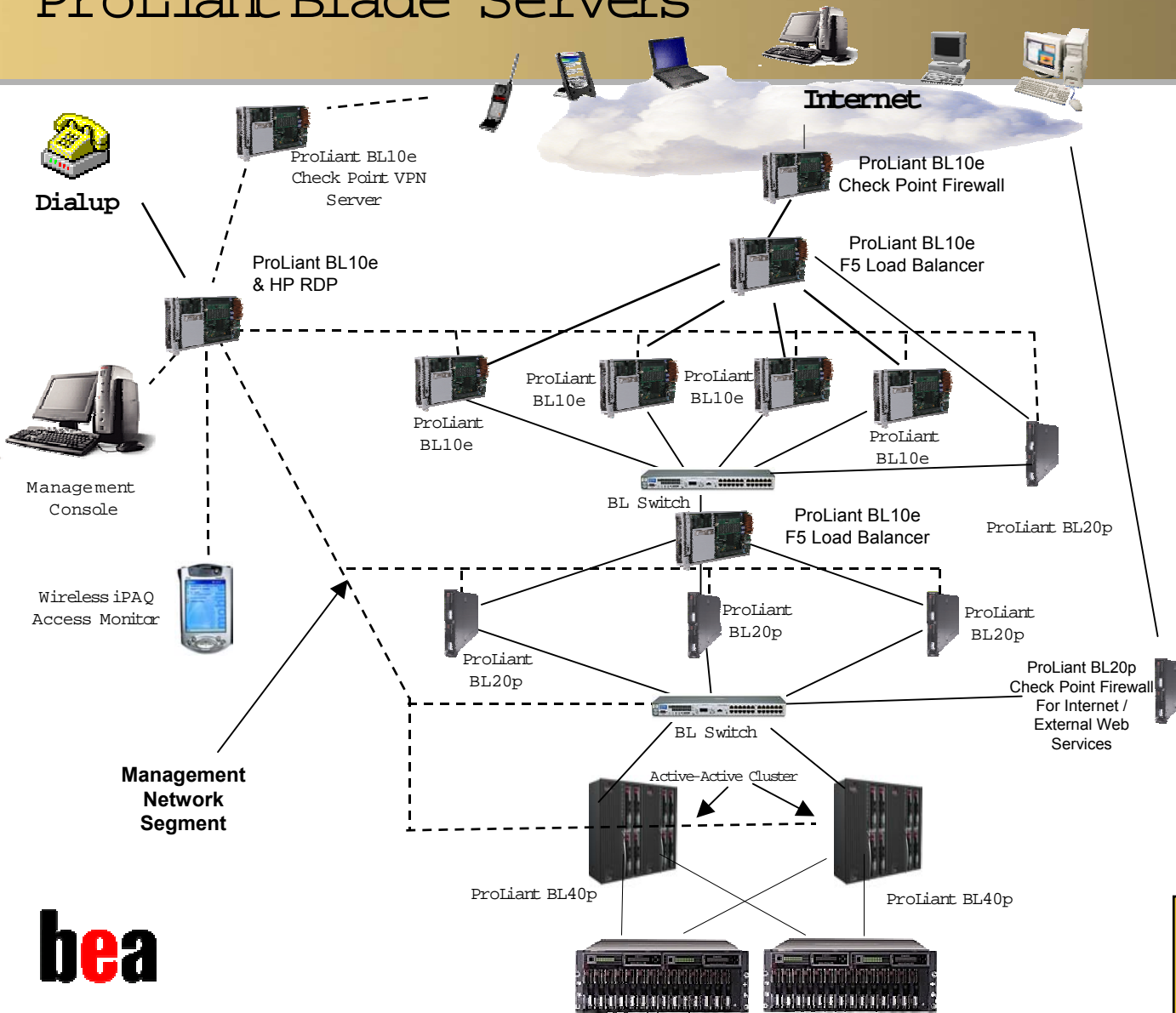
StorageWorks 4314   Modular SAN Array 1000   StorageWorks 4314   Modular SAN Array 1000

BEA WebLogic Server Under Linux on ProLiant Blade Servers

Internet

Dialup

ProLiant BL10e
Check Point VPN
Server

ProLiant BL10e
Check Point Firewall

ProLiant BL10e
& HP RDP

ProLiant BL10e
F5 Load Balancer

Management
Console

ProLiant
BL10e

ProLiant
BL10e

ProLiant
BL10e

ProLiant
BL10e

ProLiant BL20p

BL Switch

ProLiant BL10e
F5 Load Balancer

Wireless iPAQ
Access Monitor

ProLiant
BL20p

ProLiant
BL20p

ProLiant
BL20p

ProLiant BL20p
Check Point Firewall
For Internet /
External Web
Services

BL Switch

**Management
Network
Segment**

Active-Active Cluster

ProLiant BL40p

ProLiant BL40p

Modular SAN Array 1000

**Access
Clients**

Firewall

**F5 Load Balancer
on a BL10e blade**

**Covalent Apache
Web Servers**

**Application Servers
Running BEA
WebLogic Servers**

**ProLiant Servers
w/Oracle 9iRAC**

**ProLiant Storage Works,
Storage Area Networks and
Storage Management Software**

Summary

Almost any application for Windows and Linux can be implemented on ProLiant BL Blade systems

ProLiant BL
endorsements

"At Starbucks, we have relied on HP ProLiant server technology for more than seven years because it has consistently addressed the rapidly changing needs of our business. Today, HP has done it again with the introduction of the HP ProLiant BL e-Class. The innovative blade design is exactly what we need--it's the right thing at the right time."
---Kenneth Stringer, Vice President, IT Global Shared Services for Starbucks

HP has continued its innovative engineering leadership by delivering the industry-standard performance we rely upon with the optimal power-efficient ProLiant BL10e server blade of the new ProLiant BL e-Class.
---Barry Brazil, Enterprise Architect

By introducing the HP ProLiant BL e-Class into our enterprise data center, we will achieve new levels of efficiencies in power, IT resources, and space that will translate directly into cost-savings and be passed along to our customers' bottom line."
---Todd Preece, Sr. Internet Systems Manager

IT consolidation:

Challenge

New Balance was looking for a server refresh, with maximum ROIT, data center real estate savings and ease-of-deployment capabilities

Solution

HP ProLiant BL20p blade servers and enclosures, which allowed New Balance to deploy in their current ProLiant rack architecture and use the drive compatibility features to save time on data migration.

Results

Decreased the server deployment time from 150 minutes to 15 minutes per server. While compute requirements have grown, the staff required to deploy & manage has stayed the same.

"...I could see lots of possibilities for easy blade upgrades and future technology." – Pierre Baudet, Business Systems Manager, New Balance

Why HP ProLiant blades?

- Comprehensive portfolio, unmatched in the market
- First to market with blades
- Strongest suite of deployment and management tools
- Fully enabled virtual remote management
- Densest blade offering with hot plug SCSI drives (+12%)
- Flexible interconnect options
- Investment protection
- ProLiant advantages (Depth of integration and reliability testing, frontline partnerships, global support)

HP is the best choice for blades!

Blade Applications at HPworld?

- In the HP exhibit area:
  - Microsoft web hosting & automated provisioning using Windows 2003
  - Lotus Notes
  - Sendmail
- In the F5 Networks exhibit area
  - F5 Big-IP Blade Controller software
- In the Microsoft exhibit area:
  - Provisioning blades with Windows tools

- Other sessions & workshops:
  - Quantifying the Value of Blade Systems – 2194
  - Common Blade Solutions for the Adaptive Enterprise - 2195
  - Future Blade System Architectures (NDA) – 2371
  - ProLiant Clusters: deploying Blade Clusters – 2187
  - *Workshop:* Implementing Blade Clusters with MSA1000 – 2274
  - *Workshop:* Blades 101 – HP Blade server planning & deployment - 2275

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