Dynamic resource allocation model – Oracle 10g Grid and HP BladeSystem

HP Solutions Alliance – Oracle

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Executive Summary

- Implementing an Adaptive Enterprise IT strategy is key to capitalizing on business change

- Identifying opportunities for practical implementation of this strategy is the challenge

- The following presentation offers a tactical example based on HP BladeSystem technology

"The ability to manage change is increasingly the difference between the companies that win and the companies that lose."

- Carly Fiorina

HP BladeSystem reference architecture for Oracle 10g Grid - components

- The HP BladeSystem Reference Architecture
  - Solutions specifications optimized on HP Blades
  - Partnership with ISV and technology partners
  - Focused Engineering and services content

- The HP Parallel Database Cluster for Oracle
  - Tested and proven solutions stack for Oracle RAC
  - Reliable and repeatable implementation processes and tools
  - Backed by HP RAC Services and call center support

- HP Blades Management
  - Systems Insight Manager
  - Rapid Deployment Pack
  - Integrated Lights Out Management
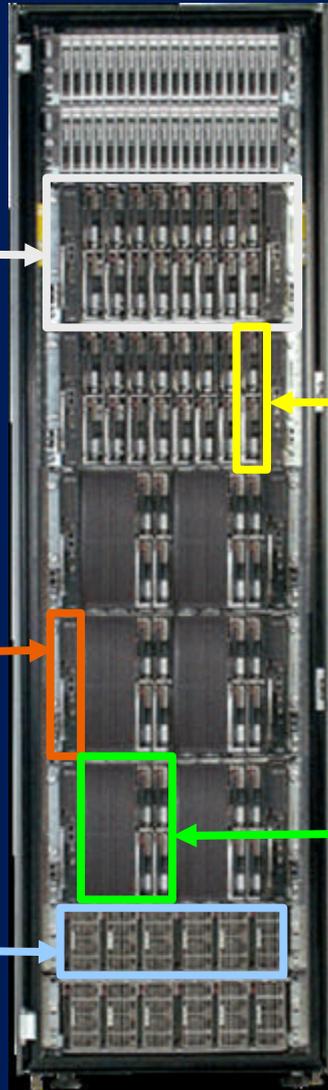
- Oracle 10g Grid and Real Application Clusters on Linux

ProLiant BL p-Class Blades

6U server enclosure: routes power, networking, & FC thru backplane for 32 :1 cable reduction

network interconnect modules: GbE2, redundant NIC teaming, FC consolidation

power enclosure: redundant, hot plug power supply pool eliminates cables and PDUs

Rapid [   ]nt Pack

BL20p G2 2P server: max 8 per 6U enclosure (16p), 2 Xeon 3.2 GHz, max 8GB mem., 2 drives, 3 NICs, 1 iLO, dual FC

BL40p 4P server: max 2 per 6U enclosure (8p), 4 Xeon 3.0 GHz, max 12GB mem., 4 drives w/ RAID contrlr, 5 NICs, 1 iLO, 2 slots for FC

Oracle scale-out solutions

Oracle Application Server, E-Business Suite, Collaboration Suite

Real Application Clusters database servers (some app servers)

ProLiant BL p-Class SAN storage solutions

- HP MSA, EVA and XP storage
- Select EMC and Hitachi storage
- BL20p G2 SAN connectivity:
  - Optional dual port FC w/ QLogic chip set
  - Max data transfer rate of 2Gb/s per port (each direction)
  - Simplified cabling with backplane routing to patch panel
- BL40p SAN connectivity:
  - Two 64bit PCI-X expansion slots available for optional HBAs
  - Supported HP HBAs w/ QLogic chip – FCA2241 single & dual
  - Max data transfer rate of 2Gb/s per port (each direction)
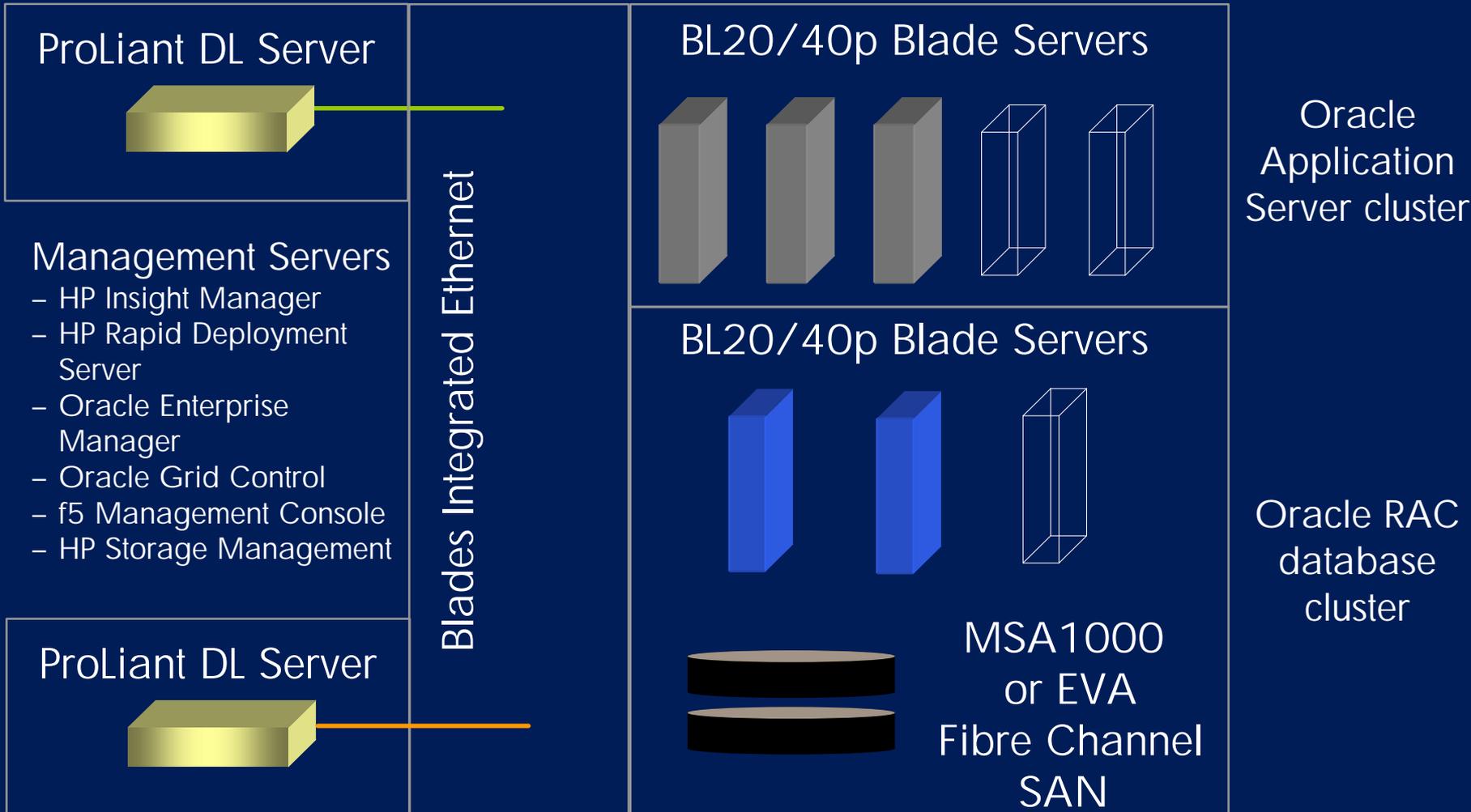 - Traditional HBA cabling

BladeSystem management stack

- **HP Systems Insight Manager**
- Central management console
- Web browser or command line
- Status & alerts for ProLiant and Integrity servers
- Distributed tasks via secure shell (SSH)
- Role-based security

- **HP Integrated Lights-Out (iLO)**
- Remote Administration/Management
- Browser access to full functionality

- **HP Rapid Deployment Pack**
- Supports scripted or imaged OS installation
- Event utilities initiate actions from command line
- Image editor to add or change images
- Distribute patches, security updates, applications
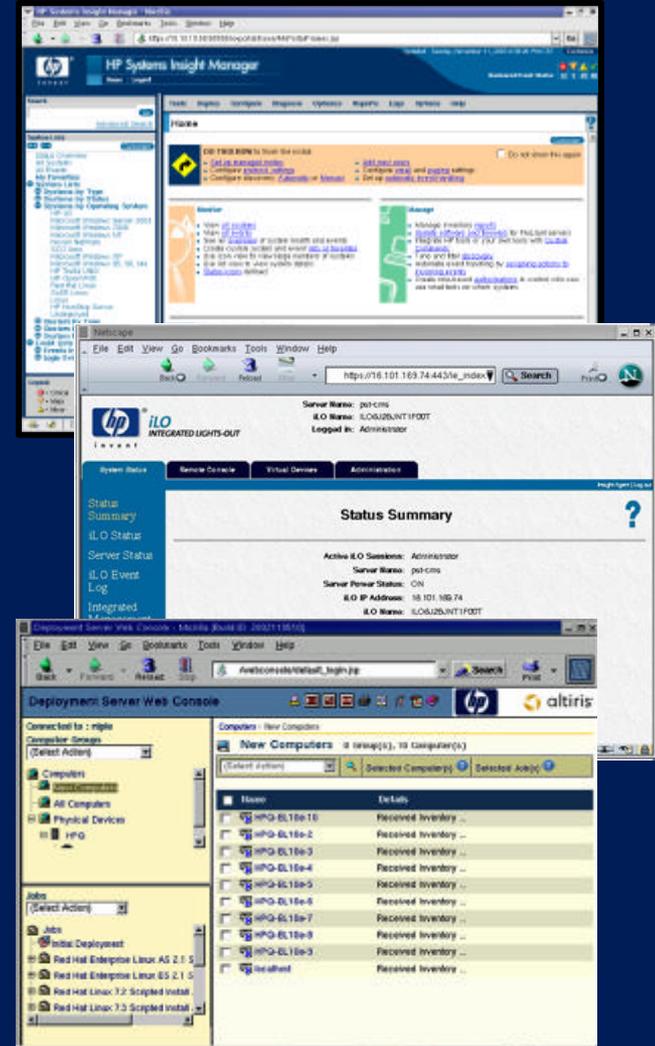
Browser access from Netscape and Mozilla

Blades RA with Oracle hardware and software configuration

ProLiant DL Server

Management Servers
- HP Insight Manager
- HP Rapid Deployment Server
- Oracle Enterprise Manager
- Oracle Grid Control
- f5 Management Console
- HP Storage Management

ProLiant DL Server

Blades Integrated Ethernet

BL20/40p Blade Servers

BL20/40p Blade Servers

MSA1000 or EVA Fibre Channel SAN

Oracle Application Server cluster

Oracle RAC database cluster

Dynamic allocation scenarios

- Temporary capacity increase
  - Critical sales application is experiencing abnormal demand – deploy additional server resource by RDP drag and drop of image
  - HP Parallel Database Cluster RDP sample scripts personalize new servers, expand cluster definitions and load balancing matrix on-line

- Failed server node:
  - Oracle RAC with Grid Control automatically redirects client connections to surviving node, without interruption of service
  - RDP recognizes replacement server on boot
  - Provision with production software via RDP drag and drop image
  - Custom RDP scripts personalize new server, rejoins cluster
  - Oracle Grid Control dynamically rebalances client traffic

Blades RA with Oracle dynamic resource allocation model

- Capture existing server images w/ HP Rapid Deployment Pack

- For replacement or expansion drag and drop image via RDP

1. New server integration via HP RDP scripting for Oracle

2. App Tier load balancing via f5 Networks BIG-IP

3. RAC cluster load balancing via Oracle 10g Grid Control

Application Servers

RAC Cluster Nodes

HP Rapid Deployment Server

iLO Network

Image repository

MSA1000 or EVA Fibre Channel SAN

Blades Management and scripts

Add a RAC node

Integrated Lights-Out interface -

- PXE boot with automatic discovery by RDP server and awaits instruction

From RDP server, submit multi-task job (drag and drop) to new server:

- Create RAID 1 volume for OS
- Deploy pre-captured RAC image
- Reboot with generic network configuration
- Update OS and Oracle for unique network and node name etc.
- Reboot system with new network configuration)
- Update Oracle CRS Grid data to include new RAC node
- Start up Oracle services (Listener, virtual IP, etc) and db instance

Server begins responding to app

Add an Application node

Integrated Lights-Out interface -

- PXE boot with automatic discovery by RDP server and awaits instruction

From RDP server, submit multi-task job (drag and drop) to new server:

- Create RAID 1 volume for OS
- Deploy pre-captured APPS generic image
- Reboot with generic network configuration
- Update OS and Oracle for unique network and node name etc.
- Reboot (System comes up with new network configuration)
- Update f5 BIG-IP load balancing configuration to include new node
- Start up application, f5 services etc.

Server begins responding to clients

Summary

- HP Delivers
  - Simplicity
    - Standard components tightly integrated with partner applications
      - Blades Reference Architecture program
      - Linux Reference Architecture program
      - HP Parallel Database Cluster for Oracle RAC

  - Agility
    - HP ProLiant Essentials Management software
      - Systems Insight Manager element management
      - ProLiant Essentials iLO and Rapid Deployment Pack

  - Value
    - Tightly integrated and cost effective Oracle RAC solution stack
    - Value-add engineering content and open tools => lower TCO