

Session 2187

ProLiant Clusters: Deploying Blade Clusters

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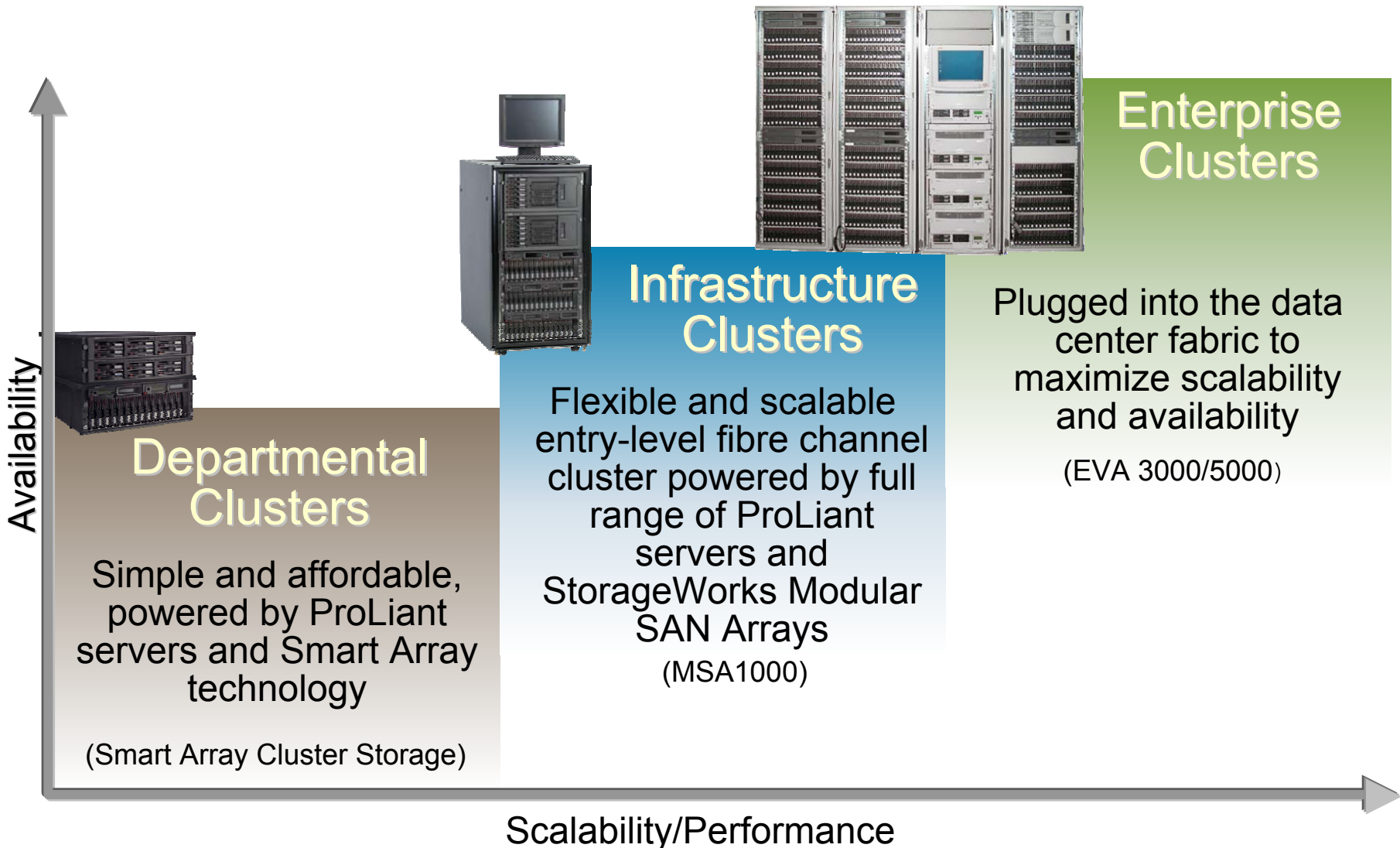
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Agenda

- ProLiant Cluster product offerings
- ProLiant Blade Cluster SAN configurations
- ProLiant Blade Clusters overview
- ProLiant Blade Cluster deployment overview
- ProLiant Essentials Rapid Deployment Pack
- ProLiant Blade Cluster deployments using RDP 1.40
- ProLiant Blade Cluster deployment walkthrough
- Questions

ProLiant Cluster Product Offerings



ProLiant Cluster HA/F200 (MSA1000)

- Multi-cluster support
- 2Gb support
- Max 20 cluster nodes
 - 4 total clusters
 - 5 total clusters if 2-node
- Interconnect devices
 - 1Gb / 2Gb SAN switch
 - 8 port internal switch
- Secure Path support



ProLiant Cluster HA/F500 (Enterprise Virtual Array)

- Multi-cluster support
- Virtualization support
- 2Gb support
- Max 32 cluster nodes
- Interconnect devices
 - 1Gb / 2Gb SAN Switch
- SAN Script support
- SAN Management Appliance support
- Secure Path support



ProLiant Cluster HA/F500 (HSG80)

- Includes MA8000, EMA12000, and EMA16000
- Multi-cluster support
- 2Gb support
- Interconnect devices
 - 1Gb / 2Gb SAN Switch
- Command Scriptor support
- SAN Management Appliance support
- Secure Path support



ProLiant Blade Cluster SAN Configurations

- ProLiant BL Storage Connectivity
- Fibre Channel Adapters
- BL20p G2 Interconnect Options
 - G2 Patch Panel 2
 - GbE2 Switch
- BL40p Interconnect Options

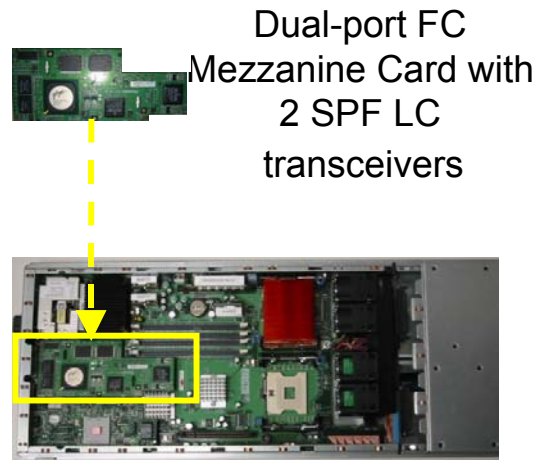


ProLiant BL Storage Connectivity

- ProLiant BL10e and BL20p
 - Network attached storage
 - No cluster support
- ProLiant BL20p G2 (Cluster Support)
 - Fibre channel (FC) via mezzanine card (with a pass-through connectivity option)
 - GbE2 interconnect switch or G2 Patch Panel 2
 - Network attached storage
- ProLiant BL40p (Cluster Support)
 - (2) PCI-X slots that can be used for storage HBAs
 - Network attached storage

Fibre Channel Adapters – BL20p G2 Fibre Adapters

- Two ports on each FC mezzanine card provide a redundant fibre connection to each server blade
- Supports up to 2Gb speed
- Based on QLogic chipset
 - Supports HP StorageWorks arrays
 - Option for ProLiant BL20p G2 (not ProLiant BL20p G1)



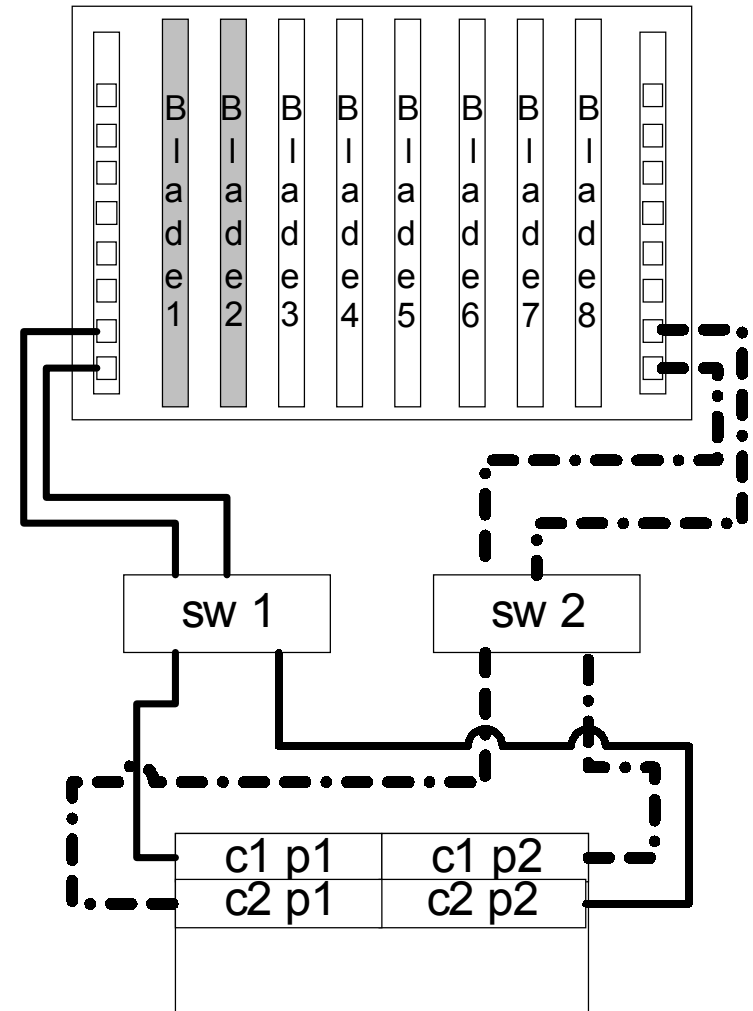
Fibre Channel Adapters – BL40p Fibre Adapters



- Adapters support up to 2Gb speed
- Standard single port PCI Fibre Channel Adapters (FCA)
- FCA2101 support
 - Based on the Emulex chipset
 - Supports HP StorageWorks arrays
- FCA2214 for Linux support
 - Based on the QLogic chipset
 - Supports HP StorageWorks arrays
- 64-Bit/33-MHz PCI-to-Fibre Channel HBA for Windows support
 - Based on the Emulex chipset
 - Supports HP StorageWorks arrays

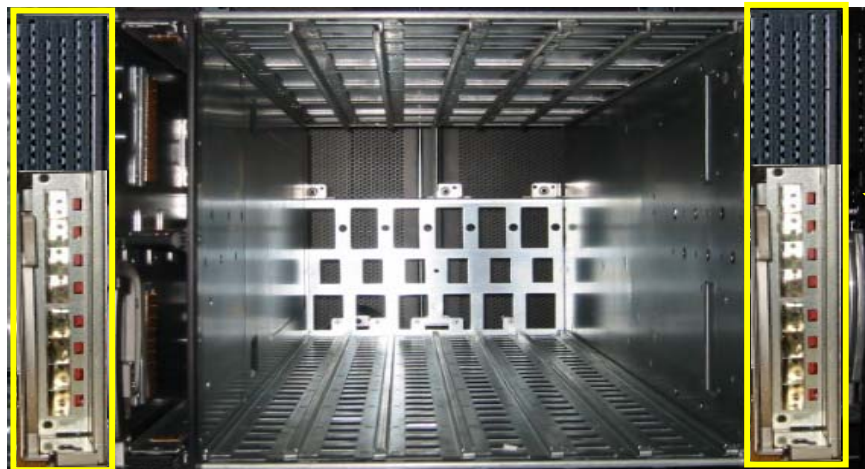
BL20p G2 Interconnect Options

- Connect to SAN switches
 - G2 Patch Panel 2 FC pass through
 - Optional GbE2 Integrated Switch with FC pass through
- Redundant FC path using the embedded FC mezzanine

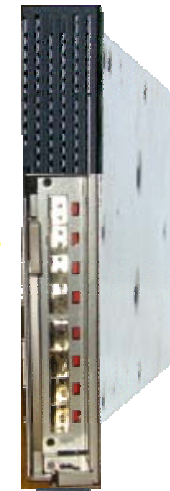


BL p-Class G2 Patch Panel 2

- Allows pass through of both LAN and SAN signals
- LAN Ethernet signals (32 total) at rear
- SAN FC signals (16) at front
 - FC cables can be routed through the a channel in the server blade enclosure for rear cable management



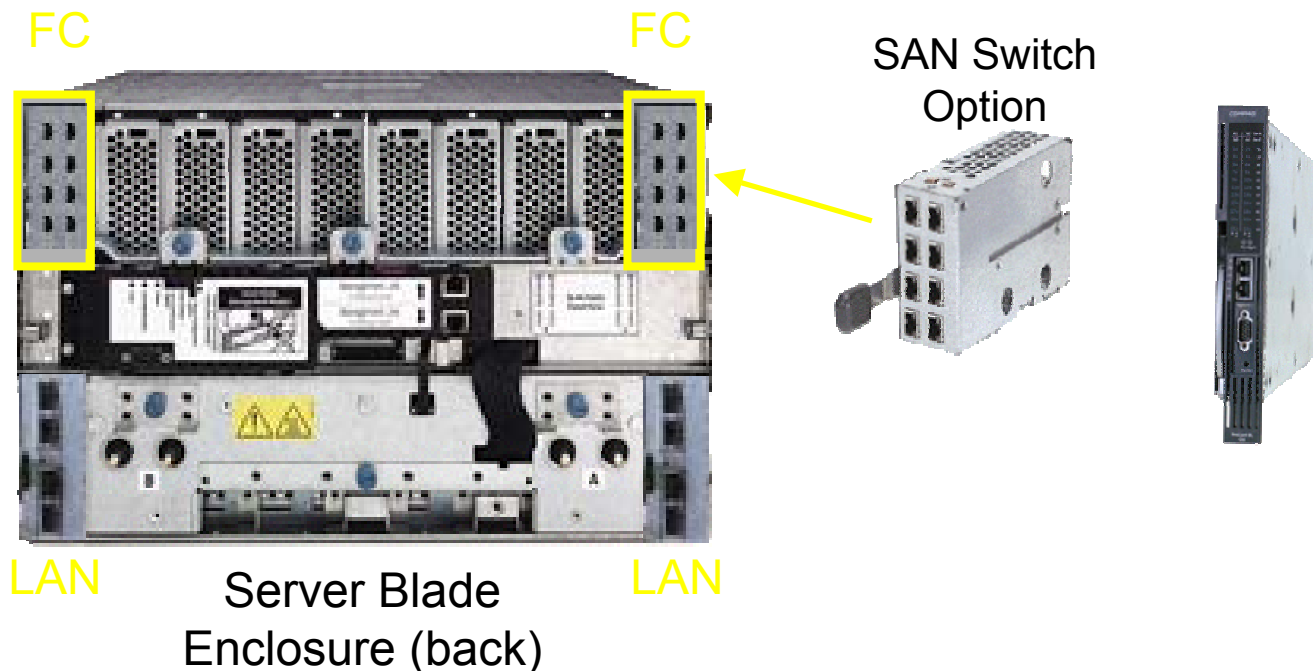
Server Blade
Enclosure (front)



G2 Patch Panel 2

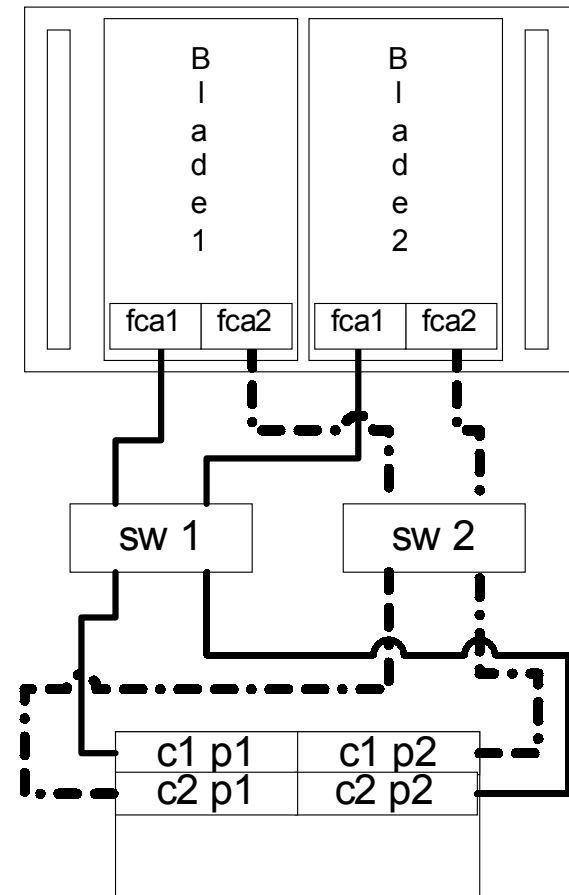
BL p-Class GbE2 Interconnect Switch

- Next generation ProLiant BL p-Class integrated switch
- Pass-through of the ProLiant BL20p G2 FC signals
- SAN interconnect module at rear of each switch
 - 8 FC GBICs (LC connectors) per switch



BL40p Interconnect Options

- Direct connection to SAN switches from FCA
 - Uses standard PCI Fibre Channel Adapters
- (2) PCI-X slots allow redundant Fibre Channel paths
- Uses standard SAN switches

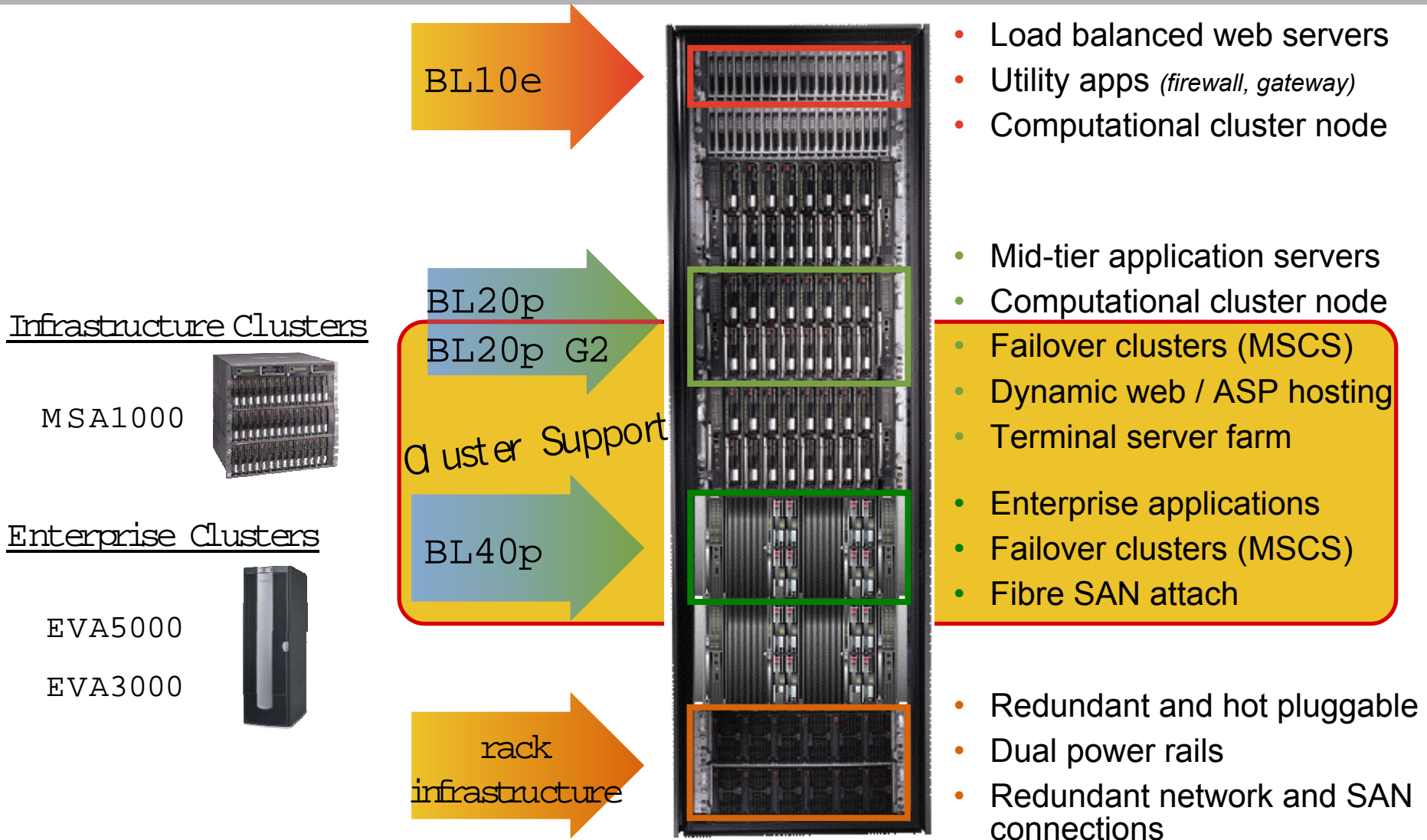


ProLiant Blade Clusters Overview



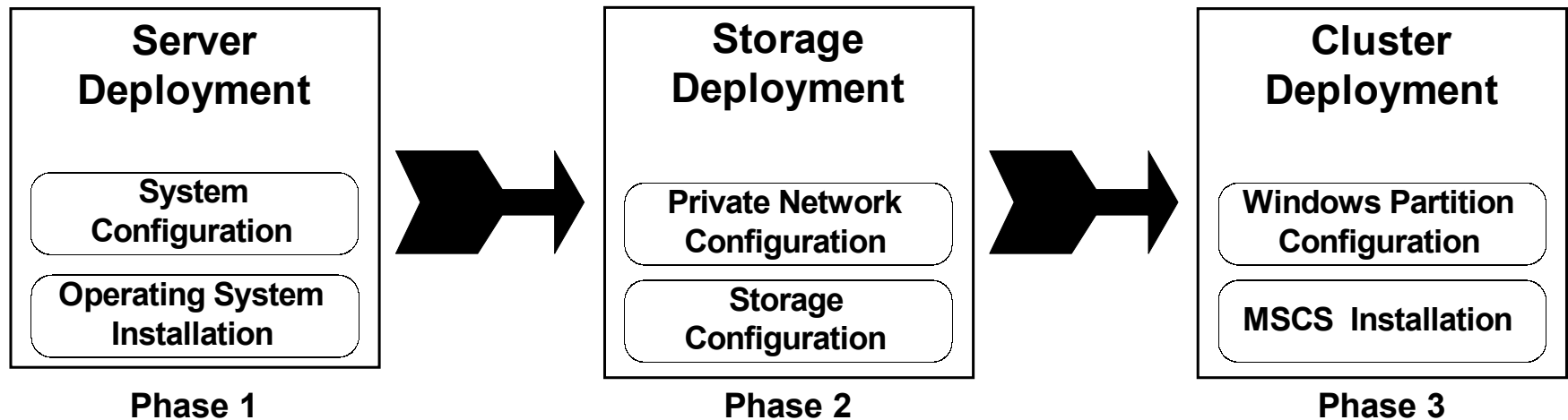
- ProLiant BL20p G2
 - Uses dual port Fibre Channel mezzanine card
- ProLiant BL40p
 - Uses standard Fibre Channel adapters
- Supported external storage enclosures
 - StorageWorks Enterprise Virtual Array (EVA 3000/5000)
 - StorageWorks Modular Array (MA8000/EMA12000/EMA16000)
 - StorageWorks Modular San Array (MSA1000)
- MSA1000, EVA 3000/5000, MA8000
- Will use standard HA/F200 and HA/F500 Cluster Kits
- Investigating Lifekeeper for Linux on Blades

ProLiant Blade Failover Cluster Support



ProLiant Blade Cluster Deployment

Conceptual Overview of Cluster Deployment



- Phase 1 - Automated server configuration
- Phase 2 - Manual private network and storage configuration
- Phase 3 - Automated Windows partition and MSCS configuration

ProLiant Blade Cluster Deployment - Phase 1



Automated server configuration with a deployment job

- Configure the blade server hardware
 - CONREP
 - ACR
 - Create partition
- Install and configure Windows
 - Install Windows
 - Install PSPs
- Deploy SAN Deliverables
 - Fibre Channel Adapter (FCA) Driver
 - FCUtil (Fibre Channel Setup Utility)
 - StorageWorks Secure Path

ProLiant Blade Cluster Deployment – Phase 2



- Manual private **network** and storage configuration
 - Use iLO, RDP, TS, or RDC for these tasks
- Configure the cluster interconnect
 - Choose from 2 free connections in BL20p G2
 - Choose from 4 free connections in BL40p
- Configure the external storage

ProLiant Blade Cluster Deployment – Phase 3

*Automated Windows partition and MSCS configuration
with a deployment job*

- Configure logical drives for use by Windows
 - Create Windows partitions
 - Format partitions
- Create or join the cluster
 - Primary node creates the cluster while the secondary node(s) waits
 - Secondary node(s) joins when the primary node creates a flag

ProLiant Essentials Rapid Deployment Pack

Features of RDP

- GUI, console-based deployment server
- 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 (via WOL, RILOE II, iLO)
- Server configuration on-the-fly
- Drag and drop tasks to create configs
- Scalable deployment without network degradation



ProLiant Essentials Rapid Deployment Pack



What's New in RDP 1.40?

- ProLiant DL380 Packaged Cluster Deployment
 - Imaging and scripting deployment jobs for Packaged Cluster
 - Support for Windows 2000 and Windows Server 2003
- Altiris Deployment Solution for Servers 5.6
- Role and scope-based security
 - Control who can perform tasks/jobs
 - Control who can manage groups of servers
 - Supports NT/AD authentication
- Switch Management Support
 - Windows 32 interface for discovering switches and attached clients
 - Ability to manually set the VLAN for the ports on the switch
 - Sample event showing how to use the CLI
 - Support for Cisco, HP ProLiant Blade, and 3 COM switches

ProLiant Blade Cluster Deployment Using RDP 1.40



- What's new for cluster deployment in RDP v1.40?
 - One unattended answer file per OS
 - One configuration file per cluster
 - One job for all blade clusters
 - More robust error checking and status reporting

- Advantages of using RDP to deploy clusters
 - Unattended installation of operating system
 - Unattended configuration of shared partitions and MSCS
 - Consistent cluster configurations
 - Deploy multiple clusters simultaneously

Blade Deployment Features for RDP 1.40

- Jobs are provided for Server Deployment...
 - Windows 2000 scripted installs
 - Scripted Windows 2000 BL20p G2 for SAN
 - Scripted Windows 2000 BL40p for SAN
 - Windows Server 2003 scripted installs
 - Scripted Windows 2003 BL20p G2 for SAN
 - Scripted Windows 2003 BL40p for SAN
- ...and for Cluster Deployment
 - BL40p/20p G2 Windows Partitions and MSCS Deployment
- These jobs can be used for all blade cluster deployments (1 OS install + the MSCS job)

Blade Deployment Features for RDP 1.40

Also provided for blade deployment RDP 1.40

- Cluster configuration file template
- Unattended text file template
- Computer import file template
- Documentation for the entire process
 - Modifying and using the configuration files
 - Modifying and using the deployment jobs
 - Configuring the private network
 - Configuring the storage system

Using the Deployment Jobs with RDP 1.40

- Complete pre-deployment configuration tasks
 - Prepare deployment environment
 - Edit cluster configuration file
 - Edit OS answer files
 - Import nodes into deployment console
 - Modify the MSCS deployment job for the domain
- Launch the Phase 1 deployment job
- Complete the manual configuration tasks for Phase 2
- Launch the Phase 3 deployment job
- Validate cluster deployment

Pre-Deployment Steps - Preparing the Environment



- Download and run setup for blade deployment files
 - Download SP24893 (see link at end of presentation)
 - In `.\extras\bladecluster` on RDP 1.40 CD
- Cable the network for all blades to be deployed
 - Connect PXE-capable NIC to deployment server
- Create and populate *san* directory on deployment server with most current SAN deliverables
 - FCA2101 (`.\san\kgpsa`)
 - Embedded FC mezzanine in BL20p G2 (`.\san\q1a`)
 - Secure Path Server (`.\san\sps.40b`)
 - FCUtil (`.\san\kgpsa` and `.\san\q1a`)

Cluster Configuration File

- A cluster configuration file is required for each cluster deployed
- Name the configuration file after the cluster
 - Ex: *mycluster.ini*
- Edit the `cluster` section with cluster specific variables
 - Removes admin credentials from the deployment job

```
;===Cluster Section=====
[Cluster]
account=administrator
password=password
domain=rdp
ipaddr=30.31.0.50
subnet=255.255.0.0
```

Cluster Configuration File

- Edit the `Network` section with cluster network information
 - Used to specify network for cluster
 - Allows a choice for NIC to host private network
- The private network addresses specified are not used

```
;===Network Section=====
;PRIVATE0=1.1.1.1
;PRIVATE1=1.1.1.2
;ClusPublicNet=Local Area Connection
;ClusPrivateNet=Local Area Connection 2
```

Pre-Deployment Steps – Unattended OS Answer File

- Only one Windows unattended answer file is need for all cluster nodes (*w2kclus.txt* and *wnetclus.txt*)
- Verify all required values

```
[GuiUnattended]
  AdminPassword=*

[UserData]
  ProductKey=* (needed if not using a Microsoft Select distribution)
  FullName=*
  OrgName=*

[Identification]
  DomainAdmin=*
  DomainAdminPassword=*
  JoinDomain=*

[Components]
  Cluster=On (only needed for Windows 2000 AS deployments)
```

Pre-Deployment Steps – Importing Computers



- Servers must be in the deployment console before execution of jobs
- 3 methods for computer import available
 - Import file
 - Manual import via GUI
 - Configure node details after automatic discovery via PXE

Pre-Deployment Steps – Method 1: Import File



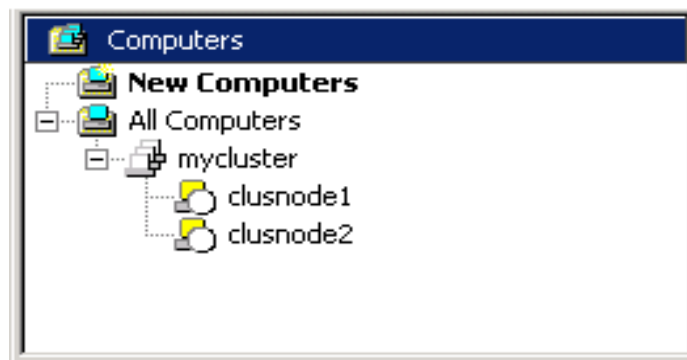
- Deployment server import mechanism using a formatted computer import file
- Required values
 - Server name/console name
 - Server serial number (or MAC address of PXE NIC)
 - Domain name
 - Cluster name (computer group name)
- Don't forget the commas!

Computer Import File Sample Text

```
PNODE1,,D129FRW1K361,,PNODE1,1,CLUSDEMO,,1,,,,,,,,,,,,,,,,,HASE,hp,,,,  
,,,,,,,,,PCLUS,,,,,15.15.15.1,255.0.0.0
```

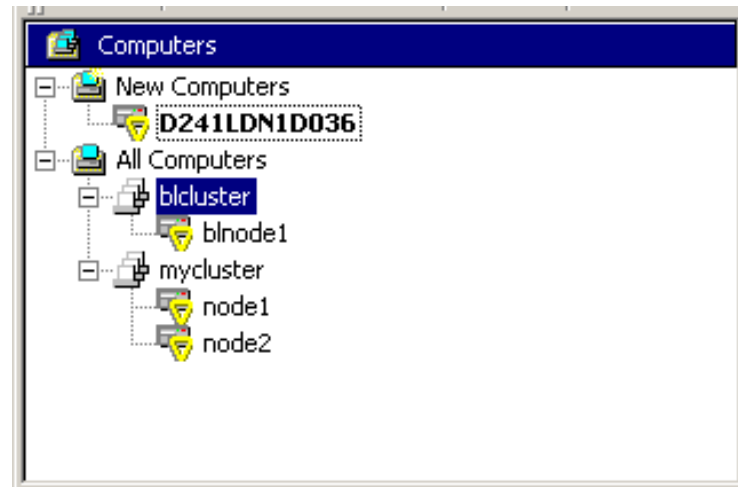

Pre-Deployment Steps – Method 2: Import GUI

- Use *New Computers GUI* to add each blade to console
- For each node, provide
 - Server name/console name
 - Server serial number (or MAC address of PXE NIC)
- Once all nodes are in the Altiris console:
 - Create a group with the same name as the cluster
 - Move the renamed cluster nodes into the new group



Pre-Deployment Steps – Method 3: After PXE Boot

- Once a server boots using PXE, it shows up in the console
- Once all nodes are in the Altiris console:
 - Create a group with the same name as the cluster
 - Rename each machine in the console
- Move the renamed cluster nodes into the new group



Launching the Deployment Jobs – Phase 1



- Complete all pre-deployment tasks
- Drag-and-drop the appropriate OS deployment job onto the cluster group
- After the manual configuration tasks are complete, drag-and-drop the storage and cluster deployment job onto the cluster group

Manual Task: Configuring the Networks – Phase 2



- Manual configuration of the network cards
 - Configure the cluster private interconnect
- ProLiant BL20p G2 has a total of 4 network connections
- ProLiant BL40p has a total of 6 network connections

Manual Tasks: Storage Configuration – Phase 2

- Connect the storage box to the SAN switches
- Configure the SAN appliance
- Create the zones on the SAN for the cluster
- Create the logical units
- Present the drives to the Blade servers via SSP

Launching the Deployment Jobs – Phase 3




- Complete the manual configuration tasks in Phase 2
- Drag-and-drop the **BL40p/20p G2 Windows Partitions and MSCS Deployment** job onto the cluster group
- Set permissions on the Create/Join cluster task

Validation of Cluster Deployment

- Initiate a failover of all of the cluster groups
 - In a Microsoft Windows Server 2003, Enterprise Edition n-node configuration, failover to all nodes
- Verify all resources come online
- Initiate a failback of all cluster groups
- Verify all resources come online

ProLiant HA Web Site

<http://www.hp.com/servers/proliant/highavailability>



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Clustering Spotlight

Get the Latest Information on News, Success Stories, and more



Microsoft Windows Server 2003

"Find out more about HP ProLiant Cluster support for Microsoft Windows Server 2003, Enterprise Edition. Everything you need to know for migrating your existing clusters or installing new clusters".

» details

Other Information

- Blade Cluster Deployment Files
 - SP24893 available at HP High Availability Website
<http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/proliant-bl.html>
 - Or on the RDP-WE 1.40 CD
[.\extras\bladecluster](#)
- HP High Availability Solutions
 - www.hp.com/servers/proliant/highavailability
- ProLiant Essentials Rapid Deployment Pack
 - www.hp.com/servers/rdp
- Session 2186 - ProLiant Clusters: Deploying a Well Managed ProLiant Cluster for Windows

Questions?





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BL20p G2 Interconnect Options

		Provides network cable reduction	Supports FC pass-through for BL20p G2	Supported NIC speeds from server blade
Patch Panels	G2 Patch Panel	No	Yes	10/100/1000
Switches	GbE2 switch <i>(4Q03 Availability)</i>	Yes	Yes with GbE2 switch FC Option	10/100/1000