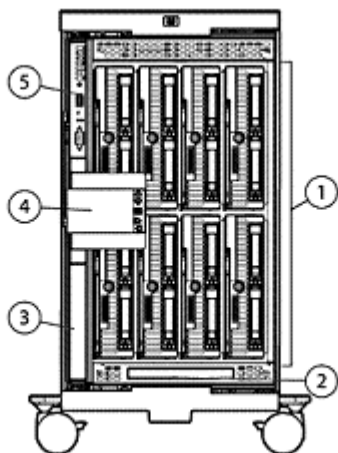
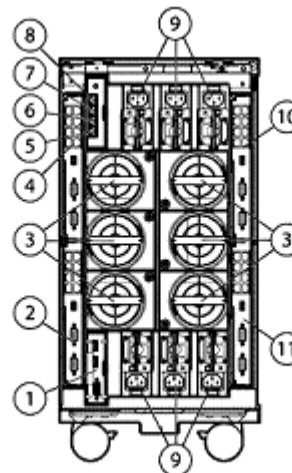


### Overview



HP BladeSystem c3000 Enclosure – Tower – Front View

1. Device Bays 1 thru 8
2. Enclosure DVD Drive
3. Standby Onboard Administrator (reserved for Future)\*
4. Insight Display
5. Active Onboard Administrator



HP BladeSystem c3000 Enclosure – Tower – Rear View

1. Local KVM interface\*
2. Interconnect Bay 1
3. Active Cool Fans
4. Interconnect Bay 2\*
5. Enclosure Up-link and Service Port
6. Enclosure Down-link
7. iLO/Onboard Administrator Port
8. iLO/Onboard Administrator Port 2 (reserved for future)\*
9. Power Supplies
10. Interconnect Bays 3 & 4
11. Enclosure Up-link and Service Port

\* Not currently used in the HP Cluster Platform Workgroup System configurations.

### At A Glance

- HP Cluster Platform Workgroup System (CP Workgroup System) is a single c3000 enclosure implementation of the HP Cluster Platform Express, with the most commonly selected configuration options. The CP Workgroup System comes with two hardware packages: the CP Workgroup System (Tower) is based on the HP BladeSystem c3000 Tower enclosure and the CP Workgroup System (Rack) is based on the HP BladeSystem c3000 rack enclosure. This quickspec documents the details for the CP Workgroup System (Tower). For details on the CP Workgroup System (Rack), please refer to the quickspec for the HP Cluster Platform Express.
- The simplified product menu eases configuration and ordering for solutions that require up to 8 server blade compute nodes or less, and are using Gigabit Ethernet or InfiniBand as the cluster interconnect
- Comprehensive single enclosure cluster offerings for high performance computing (HPC), integrating servers, networks with choice of HPC software and services
- The CP Workgroup System can be deployed easier and faster, requires less space, and is suitable for small to medium businesses, as well as HPC workgroup teams who may have constraints in space, power and cooling capacity, and limited local IT support.
- Customers who need more computing capacity than the HP CP Workgroup System should consider the HP Cluster Platform Express which is a single rack solution, or the HP Cluster Platforms which are the most scalable cluster configurations with up to 1024 nodes (larger clusters can be supported via custom configuration). See: <http://www.hp.com/go/clusters> for more information.
- Software options include the Linux or Windows operating system, cluster management (HP XC System software, HP CMU, HP ICE-LX or Scali Manage) and HP-MPI, with optional in-factory installation. Complementary HPC software products are offered

### Overview

by HP, tested and supported on HP Cluster Platforms by leading developers of cluster tools and applications. In addition, the HP ProLiant HPC Partner Software Suite is also available for customers wishing a broad coverage of infrastructure software including: compilers and cluster development tools, Job Management, Grid Resource Management, and Storage Management solutions suited for both Linux and Windows environments.

- Clusters are assembled to worldwide design specifications developed, tested and supported by HP. Configured and tested within HP Integration centers, with final integration at customer site (unpacking, assembling, power up and check).
- HP Consulting and Integration services offered include: Start-up Services and Knowledge Transfer, Cluster Implementation Program Management, Quickstart Services, including applications migration, and On-site Training.

HP Cluster Platform Workgroup System is available from HP Sales Representatives and HPC-Certified Resellers, utilizing Cluster Platform Express configurators. Quotes can be requested by submitting a form available at the following web site:

<http://www.hp.com/go/cp-express>.

### Basic Architecture Components: Nodes

- One control node is included per cluster. Choice of node is often based on capability to support external networks and/or attached storage. Optionally, a storage blade (SB40c) can be added adjacent to the control node (not available when a BL2x220c or DL1xx is selected as the control nodes) in the enclosure for expanded direct-attached storage. When InfiniBand is selected as the high performance interconnects, a host-based InfiniBand subnet manager software will also be running on the control node to establish and manage the InfiniBand fabric (this option is currently supported for Linux only).
- Compute (or application) nodes: nodes are primarily used for application computation, rather than administrative workloads. Control and compute nodes should belong to the same processor family.

### Basic Architecture Components: Networks

- InfiniBand Interconnect: an optional dedicated network to support internodes communication traffic (such as MPI communications) and file transfer. To add the InfiniBand interconnect option, a HP 4X DDR IB switch module must be selected and installed in switch bays 3&4, a HP 4X DDR mezzanine HCA card must be selected and added on each server blades (control node and compute nodes), and Voltaire InfiniBand software (driver and the host-based subnet manager) be selected. Both IB driver and the IB subnet manager have to be either from Cisco or from Voltaire - a mix and match is not supported. The host-based subnet manager from Voltaire (BladeFM) is supported on Linux only.
- Administrative network: The administrative network facilitates administration and management of the cluster, such as management of the user's applications. The Gigabit Ethernet admin network can also be shared with the internodes communication traffic (such as MPI communications).
- One console network provides access to the node's console network, enabling use of node-specific command functions such as power on. This network is provided by the iLO port on the Onboard Administrator (OA) in the c3000 enclosure.

### Basic Architecture Components: Infrastructure

- HP BladeSystem c3000 Enclosure (Tower) is a single-phase enclosure available worldwide for use with in-rack PDUs & UPSs or alternatively, in countries with low-line (100VAC to 110VAC) power outlets, the enclosure's power supplies can be connected directly to low-line wall outlets.
  - **NOTE:** Caution: when connecting directly to wall outlets, customers should determine the maximum amperage of the wall outlet circuit to prevent power overload.

### Basic Architecture Components: Software

The following components are available on the HP Cluster Platform product menu, and can be factory installed by HP:

- Operating systems options
  - Linux: Red Hat Enterprise Linux (RHEL) 5.0 and SUSE SLES 10 are available per node, or in HPC 8 packs. . HPC 8 packs subscriptions are for the Basic Server for RHEL. A Red Hat-compatible Linux is also included with the XC System Software management option below.
  - HPC 8 packs require purchase of one 10-incident Care Pack from HP Services, unless systems are covered by broad HP

### Overview

- Service agreement for Linux support.
- Microsoft® HPC Server™ 2008.
- Cluster management software options
  - HP XC System Software, developed and supported HP cluster solution integrates Linux OS, HP-MPI, Platform LSF HPC, and open source components to deliver comprehensive solution
  - HP CMU is available, offered with HP Cluster Platform Express with Red Hat or SUSE software OS selections.
  - HP Insight Control Environment for Linux (ICE-Linux) provides comprehensive imaging, deployment, monitoring, and management for Linux-based HP ProLiant server platforms. ICE-Linux is not offered factory integrated.
  - Platform Computing's Scali Manage is available, offered with HP Cluster Platform Express with Red Hat or SUSE software OS selections.
  - Microsoft HPC Server 2008 provides the components which are added onto the Windows OS to provide an HPC server. This includes a combination of interfaces, utilities, and management infrastructure (e.g., Job Scheduler) that are commonly used in HPC environments. This bundle can be factory pre-installed with HP ProLiant DL and BL server nodes.

### Summary Table of Cluster Platform Workgroup System Tower Options

Cluster Platform Workgroup System	Control node	Compute node	High Performance Cluster interconnect
	HP ProLiant BL460c * HP ProLiant BL460c G5 * HP ProLiant BL260c G5 * HP ProLiant BL2x220c G5  *w/ optional SB40c for more direct-attached storage	HP ProLiant BL460c HP ProLiant BL460c G5 HP ProLiant BL260c G5 HP ProLiant BL2x220c G5	InfiniBand, or use cluster's Gigabit Ethernet admin network
	HP ProLiant BL465c G5 w/ optional SB40c for more direct-attached storage	HP ProLiant BL465c G5	

### Standard Features

#### Packaging for HP Cluster Platform Workgroup System

- Tower: a single HP BladeSystem c3000 Tower enclosure with up to 8 HP ProLiant BL blade servers
- Rack: a single HP BladeSystem c3000 (rack) enclosure with up to 8 HP ProLiant BL blade servers and 1 (optional) HP ProLiant DL server as the control node, in a 22U rack. See more details in the quickspec for the HP Cluster Platform Express.

The CP Workgroup System Tower consists of one HP BladeSystem c3000 Tower enclosure with one OA, one DVD drive, one GbE2c Ethernet Switch blade, one control node and minimum of two compute nodes, fans and power supplies (quantity depending on the actual configuration of the server blades). A keyboard/monitor (not included) will be needed to access the enclosure and blades for initial setup

Delivered on shock resistant pallet

All hardware parts (servers, switches, etc) are installed in the enclosure

Fully pre-wired and factory integrated

### HP Cluster Platforms Workgroup System with HP ProLiant BL460c or BL460c G5 Compute Nodes

#### Control Node

HP ProLiant BL460c server blade

**NOTE:** Complete information on the servers can be found in the following QuickSpecs:

<http://h18000.www1.hp.com/products/quickspecs/division/12534.html>

<b>Choose Processor Option</b>	All currently shipping processors for each control node are available. Select one or two processors
<b>Memory Option</b>	HP ProLiant BL460c is available with PC2-5300 DDR2 FB-DIMMs. Maximum memory is 64GB per node.
<b>DVD Option</b>	Covered in the enclosure configuration
<b>Disk Option</b>	One disk minimum for control node, up to two HP SATA or HP SAS Small Form Factor drives can be configured. Optionally, SB40c storage blade can be added for more direct-attached storage.
<b>PCI - I/O Options</b>	HP ProLiant BL460c server blade has two multifunctional Gigabit NICs integrated. When InfiniBand interconnect is selected, a PCI-Express InfiniBand Mezzanine card must be added, and the IB driver software right-to-use license must be added. A host-based subnet manager must also be added (Linux support only).
<b>Redundant Power Supply</b>	Covered in the enclosure configuration

### Standard Features

Compute Node	<b>Specify Number of Nodes</b>	Select number of HP ProLiant BL460c Server. Total compute nodes cannot exceed 7 nodes. <b>NOTE:</b> Complete information on the servers can be found in the following QuickSpecs: <a href="http://h18000.www1.hp.com/products/quickspecs/division/12534.html">http://h18000.www1.hp.com/products/quickspecs/division/12534.html</a>
	<b>Memory Options</b>	HP ProLiant BL460c is available with PC2-5300 DDR2 FB-DIMMs. Maximum memory is 64GB per node.
	<b>DVD Drive Options</b>	Covered in the enclosure configuration
	<b>Disk Options</b>	One or two HP SATA or HP SAS Small Form Factor Drives.
	<b>PCI - I/O Options</b>	HP ProLiant BL460c server blade has two multifunctional Gigabit NICs integrated. When InfiniBand interconnect is selected, a PCI-Express InfiniBand Mezzanine card must be added, and the IB driver software right-to-use license must be added.
	<b>Redundant Power Supply</b>	Covered in the enclosure configuration

### HP Cluster Platforms Workgroup System with HP ProLiant BL260c G5 Compute Nodes

Control Node		HP ProLiant BL260c G5 server blade <b>NOTE:</b> Complete information on the servers can be found in the following QuickSpecs: <a href="http://h18000.www1.hp.com/products/quickspecs/division/12534.html">http://h18000.www1.hp.com/products/quickspecs/division/12534.html</a>
	<b>Choose Processor Option</b>	All currently shipping processors for each control node are available. Select one or two processors
	<b>Memory Option</b>	HP ProLiant BL260c G5 is available with PC2-5300 DDR2 memory. Maximum memory is 48GB per node.
	<b>DVD Option</b>	Covered in the enclosure configuration
	<b>Disk Option</b>	One disk minimum for control node, up to two NHP SATA drives can be configured. Optionally, SB40c storage blade can be added for more direct-attached storage.
	<b>PCI - I/O Options</b>	HP ProLiant BL260c G5 server blade has two multifunctional Gigabit NICs integrated. When InfiniBand interconnect is selected, a PCI-Express InfiniBand Mezzanine card must be added, and the IB driver software right-to-use license must be added. A host-based subnet manager must also be added (Linux support only).
	<b>Redundant Power Supply</b>	Covered in the enclosure configuration

### Standard Features

Compute Node	<b>Specify Number of Nodes</b>	Select number of HP ProLiant BL260c G5 Server. Total compute nodes cannot exceed 7 nodes. <b>NOTE:</b> Complete information on the servers can be found in the following QuickSpecs: <a href="http://h18000.www1.hp.com/products/quickspecs/division/12534.html">http://h18000.www1.hp.com/products/quickspecs/division/12534.html</a>
	<b>Memory Options</b>	HP ProLiant BL260c G5 is available with PC2-5300 DDR2 memory. Maximum memory is 48GB per node.
	<b>DVD Drive Options</b>	Covered in the enclosure configuration
	<b>Disk Options</b>	One or two NHP SATA drives.
	<b>PCI - I/O Options</b>	HP ProLiant BL260c G5 server blade has two multifunctional Gigabit NICs integrated. When InfiniBand interconnect is selected, a PCI-Express InfiniBand Mezzanine card must be added, and the IB driver software right-to-use license must be added.
	<b>Redundant Power Supply</b>	Covered in the enclosure configuration

### HP Cluster Platforms Workgroup System with HP ProLiant BL2x220c G5 Compute Nodes

Control Node		HP ProLiant BL2x220c G5 server blade. This is a double-dense blade made of two 2-socket servers. <b>NOTE:</b> Complete information on the servers can be found in the following QuickSpecs: <a href="http://h18000.www1.hp.com/products/quickspecs/division/12534.html">http://h18000.www1.hp.com/products/quickspecs/division/12534.html</a>
	<b>Choose Processor Option</b>	All currently shipping processors for each control node are available. Select one or two processors per server (two or four per blade/node).
	<b>Memory Option</b>	HP ProLiant BL2x220c G5 is available with PC2-5300 DDR2 memory. Maximum memory is 32GB per server (64GB per blade).
	<b>DVD Option</b>	Covered in the enclosure configuration
	<b>Disk Option</b>	One disk minimum per server for control node, up to one NHP SATA drive per server can be configured.
	<b>PCI - I/O Options</b>	HP ProLiant BL2x220c G5 server blade has two multifunctional Gigabit NICs integrated per server. When InfiniBand interconnect is selected, a PCI-Express InfiniBand Mezzanine card must be added to each server, and the IB driver software right-to-use licenses must be added. A host-based subnet manager must also be added (Linux support only).
	<b>Redundant Power Supply</b>	Covered in the enclosure configuration

### Standard Features

Compute Node	<b>Specify Number of Nodes</b>	Select number of HP ProLiant BL2x220c G5 server blades. This is a double-dense blade made of two 2-socket servers. Total compute nodes cannot exceed 7 nodes. <b>NOTE:</b> Complete information on the servers can be found in the following QuickSpecs: <a href="http://h18000.www1.hp.com/products/quickspecs/division/12534.html">http://h18000.www1.hp.com/products/quickspecs/division/12534.html</a>
	<b>Memory Options</b>	HP ProLiant BL2x220c G5 is available with PC2-5300 DDR2 memory. Maximum memory is 32GB per node (64Gb per blade).
	<b>DVD Drive Options</b>	Covered in the enclosure configuration
	<b>Disk Options</b>	One NHP SATA drive per server (Two per blade).
	<b>PCI - I/O Options</b>	HP ProLiant BL2x220c G5 server blade has two multifunctional Gigabit NICs integrated per server. When InfiniBand interconnect is selected, a PCI-Express InfiniBand Mezzanine card must be added to each server, and the IB driver software right-to-use licenses must be added.
	<b>Redundant Power Supply</b>	Covered in the enclosure configuration

### HP Cluster Platforms Express with HP ProLiant BL465c G5 Compute Nodes

Control Node		HP ProLiant BL465c G5 Blade Server <b>NOTE:</b> Complete information on the HP ProLiant Servers can be found in the following QuickSpecs: <a href="http://h18000.www1.hp.com/products/quickspecs/division/12534.html">http://h18000.www1.hp.com/products/quickspecs/division/12534.html</a>
	<b>Choose Processor Option</b>	All currently shipping processors for each control node are available. Select one or two processors
	<b>Memory Option</b>	HP ProLiant BL465c G5 is available with PC2-5300 or PC2-6400 memory. Maximum memory is 64GB per node.
	<b>DVD Drive Option</b>	Covered in the enclosure configuration
	<b>Disk Option</b>	One disk minimum for control node, up to two HP SATA or HP SAS Small Form Factor drives can be configured. Optionally, SB40c storage blade can be added for more direct-attached storage.
	<b>PCI - I/O Options</b>	HP ProLiant BL465c G5 server blade has two multifunctional Gigabit NICs integrated. When InfiniBand interconnect is selected, a PCI-Express InfiniBand Mezzanine card must be added, and the IB driver software right-to-use license must be added. A host-based subnet manager must also be added (Linux support only).
	<b>Redundant Power Supply</b>	Covered in the enclosure configuration

### Standard Features

Compute Node	<b>Specify Number of Nodes</b>	Select number of HP ProLiant BL465c G5 Server. Total compute nodes cannot exceed 7 nodes. <b>NOTE:</b> Complete information on the servers can be found in the following QuickSpecs: <a href="http://h18000.www1.hp.com/products/quickspecs/division/12534.html">http://h18000.www1.hp.com/products/quickspecs/division/12534.html</a>
	<b>Memory Options</b>	HP ProLiant BL465c G5 is available with PC2-5300 or PC2-6400 memory. Maximum memory is 64GB per node.
	<b>DVD Drive Options</b>	Covered in the enclosure configuration
	<b>Disk Options</b>	One or two HP SATA or HP SAS Small Form Factor Drives.
	<b>PCI - I/O Options</b>	HP ProLiant BL465c G5 server blade has two multifunctional Gigabit NICs integrated. When InfiniBand interconnect is selected, a PCI-Express InfiniBand Mezzanine card must be added, and the IB driver software right-to-use license must be added.
	<b>Redundant Power Supply</b>	Covered in the enclosure configuration

### InfiniBand High Speed Interconnects

InfiniBand	InfiniBand DDR fabric is based on the HP 4X DDR IB Switch Module for HP BladeSystem c-Class. The HP 4X DDR IB mezzanine HCA has to be configured with each server blades, and IB software and host-based subnet manager (running on control node) must be configured (see above node configuration for more details).
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### Administrative and Console Network

HP GbE2c Ethernet Blade Switch for c-Class BladeSystem	The administrative GbE2c Gigabit Ethernet switch integrated in the enclosure. Access to the console network is provided by the iLO port on the OA. <ul style="list-style-type: none"><li>● Full set of industry standard Gigabit Ethernet Layer 2 features</li><li>● Sixteen internal downlinks and five uplinks and two internal cross-connects</li><li>● Wire speed switching on all sixteen 1Gb server ports</li><li>● Wire speed switching on all five 10/100/1000T uplink ports</li></ul>
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### Other Infrastructure

Keyboard and Monitor Power	A keyboard/monitor (not provided) is needed for initial set up of the enclosure and server blades. HP BladeSystem c3000 enclosure supports up to 6 1200W AC Power Supplies.  <b>NOTE:</b> Minimum one power supply is required. To determine the number of power supplies required for the configuration, please use the HP BladeSystem Power Calculator. <b>NOTE:</b> Select one wall outlet power cord for each power supply when plugging the power supplies into a wall outlet. Wall Outlet power cords should only be used with low-line (100v to 110V) power sources. If high-line power outlets are required, safety regulations require the use of a PDU or a UPS between the c3000 enclosures power supplies and wall outlets. Order the appropriate power cord for your countries standard electrical outlets. Please refer to the QuickSpecs of the HP BladeSystem c3000 enclosure for more details <a href="http://h18000.www1.hp.com/products/quickspecs/division/division.html#12831">http://h18000.www1.hp.com/products/quickspecs/division/division.html#12831</a>
Documentation	HP Cluster Platform Workgroup System User Guide

### Standard Features

#### Software

##### OS Support

##### Linux

- Red Hat EL (1 year and 3 year subscriptions)
  - Standalone server RH EL 5.0
  - HPC RHEL 8-pack 2P License
  - HPC RHEL Single Node 2P License
- SUSE SLES 10 (1 year and 3 year subscriptions)
  - HPC 8 packs: 1-8 processor nodes
- XC System Software includes full Linux distribution, compatible with Red Hat EL 4.0

##### HPC 8 pack ordering information

- Order one base kit for the 1st eight compute nodes: A standalone server subscription is recommended for control node (for SUSE SLES10, the base kit includes the subscription for the control node in addition to the first eight subscriptions for compute nodes. A standalone subscription is not necessary for the control node).
- Order add-on kits to cover remaining compute nodes(1 kit per 8 nodes in case of SUSE SLES 10, 1 kit per node in case of RHEL)
  3. 8 packs require purchase of HPS 10 incident care pack (one per cluster - extension A for physical; E for electronic)

##### Windows

- Microsoft HPC Server 2008

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#### Cluster Management

##### HP XC System Software V3.2.1

The HP-developed XC System Software integrates leading open source cluster packages with the Linux operating system, HP-MPI, and Platform Computing's LSF. The XC System software provides single-system management for job and resource scheduling and simplified software installation, resulting in unprecedented levels of ease-of-use, productivity, and scalability.

On an XC System, all of the processors must be licensed. Standard software support includes 9x5 telephone support and rights to new versions for the specified period of time (one year or three years). 24x7 software support extends the telephone support window to round-the-clock access. See the HP XC System Software Version 3.2 QuickSpecs for more information and specific part numbers. A required Base license includes one set of media and documentation.

**NOTE:** Complete information on the XC System Software, including QuickSpecs, can be found at the following URL: [http://www.hp.com/techservers/clusters/xc\\_clusters.html](http://www.hp.com/techservers/clusters/xc_clusters.html)

##### HP Cluster Management Utility

The HP Cluster Management Utility (CMU) is designed to manage a large number of compute nodes with a Single System View GUI (Graphics User Interface). HP CMU comes with a full Java GUI that can be tailored for your needs and for any number of nodes in the cluster. HP CMU is HP SIM (System Integration Manager) level 1 integration compliant. HP CMU provides a Command Line Interface (CLI) for day-to-day administration and cloning. Through its user friendly graphical interface HP CMU provides the cluster administrator with three main features:

- Administration: From HP CMU you can administrate your cluster (eg: halt, boot reboot, power off, broadcast commands from a single keyboard session)
- Cloning: For the first installation or for future updates, the cluster administrator has the capability

### Standard Features

- to propagate a system configuration image to all or a part of the compute nodes in the cluster
- **Monitoring:** At a glance the manager can see the complete behaviour of the cluster without to painfully analyse the performance of the individual compute nodes.  
In a CMU cluster configuration, all the compute nodes must be licensed. Every management node just needs a base license that includes HP CMU distribution and documentation. HP CMU software supports HP ProLiant Intel and AMD Opteron servers running Linux.

**NOTE:** Complete information on HP CMU software, including QuickSpecs, can be found at the following URL: [http://www.hp.com/techservers/clusters/cmu\\_clusters.html](http://www.hp.com/techservers/clusters/cmu_clusters.html)

#### HP Insight Control Environment for Linux (ICE-Linux)

HP Insight Control Environment for Linux (ICE-Linux) provides comprehensive imaging, deployment, monitoring, and management for Linux-based HP ProLiant server platforms. Built on the industry-leading HP Systems Insight Manager (HP SIM) framework, this solution integrates open source technology with experience leveraged from HP's Linux products in HP ICLE and HP XC Clusters, while providing paths to the future with developing management technologies.

Why use HP Insight Control Environment for Linux?

- Integrated Linux management on industry-standard ProLiant servers
  - Architected to manage expanding Linux multi-server ProLiant environments to meet the need for increased productivity, utilization, and control.
  - Leverage the best open source and HP management technologies using the established HP Systems Insight Manager (SIM) framework
  - Use established open source technologies (Nagios & others) for extensible health and performance monitoring
  - Enable workgroup and departmental clustering
  - Global support by HP

HP Insight Control Environment for Linux (ICE-Linux) brings the full expertise of HP's management investments from UNIX & Windows to the Linux environment, while providing flexibility and productivity to fulfill the variety of usual management tasks. HP ICE-Linux is a Linux-hosted solution on HP BladeSystem c-Class servers and rack servers (iLO and iLO2 capable). From bare-metal system discovery through health and performance monitoring, HP ICE-Linux enables maximum server control for productively managing Linux multi-server environments. Productivity, utilization, and control result from effectively managing Linux multi-server environments.

**NOTE:** Ordering information on HP ICE-Linux can be found in the QuickSpecs for the HP Insight Control Management Suites at the following URL:

<http://h18000.www1.hp.com/products/quickspecs/division/division.html#12949>

#### Platform Computing's Scali Manage

Scali Manage from Platform Computing enables rapid installation and configuration of clusters including the operating system, middleware, communication modules, third party applications and user data. Scali Manage provides a centralized point of installation and ongoing management for clusters, applications, interconnects and industry-standard hardware platforms.

Platform software products supplied by HP are governed exclusively by the manufacturer's license terms and other documentation accompanying such third-party software.

**NOTE:** For three year support, please order quantity 2 of 1 year support options listed below.

### Standard Features

#### HP-Message Passing Library (MPI)

HP's implementation of the Message Passing Library, HP-MPI, is offered as an option with Cluster Platform Express. HP-MPI complies with the MPI-1.2 and MPI-2 standards and is a high performance, robust, high quality, native implementation. HP-MPI enhancements provide optimized point-to-point and collective communication routines. HP-MPI is available for both Linux and Windows.

**NOTE:** HP-MPI is also included with XC Software, so no separate purchase requirement if XC selected

### Service and Support

HP Cluster Platform Workgroup System warranty and service options are based on the offerings of the underlying components.

HP customer support provides onsite hardware break/fix support and remote, remedial software call-center support. Customer support offsite software services include level 1 and 2 support:

- Level 1 is defined as everyday user/system administration issues.
- Level 2 is defined as problems related to installation and configuration, along with other problems not solvable by following the vendor-supplied documentation.

The HP software support team will work in parallel with the appropriate vendor and development groups to address level 3 and 4 support elevations:

- Level 3 elevations typically require that patches and modifications be generated by the vendor to resolve deficiencies in the product.
- Level 4 elevations deal with enhancements in the functionality of the product that will typically be included in future releases.

Optional customer services

HP has experience servicing systems, networks, storage devices, and software for HPC deployments and environments of all sizes. A wide range of purchasing options and solutions built from standards-based service modules ensure the service coverage and the level of expert assistance desired.

Optional services may be purchased at the time of the product purchase as HP Care Pack services, easy to order and easy to use service packages. Optional services may also be purchased at a later point of time as HP Contractual or Per-Event Services to extend and/or expand and/or complement the standard product warranty.

Hardware Support: Service capabilities include total lifecycle support, preventive and diagnostic services, access to a global service network, and support for an array of third-party peripherals.

Hardware Support Services offer a full range of high-quality remote and onsite hardware support options to meet specific response or repair-time objectives. These support options range from next-day or 4-hour onsite response to 6-hour call-to-repair time commitments. To accommodate specific hours of operations, coverage window options range from standard business hours (9x5), Monday-Friday 8am-5pm local time up to 24x7.

Software Support: Standard software support includes 9x5 telephone support and rights to new versions for the specified period of time (one year or three years). 24x7 software support extends the telephone support window to round-the-clock access. Standard software support includes customer access to technical resources during standard hours (see later), problem analysis, escalation management, and resolution. HP also provides unlimited access to an electronic facility that includes a knowledge database with known symptoms and solutions, software product descriptions, specifications, and technical literature.

Software support contracts can be obtained to meet the needs of customers, including remedial technical

### Standard Features

remote support along with migration and upgrade planning and a full suite of proactive deliverables.

**NOTE:** For more complete information on HP Services offerings, customers and resellers, please visit us at: <http://www.hp.com/hps>

**NOTE:** Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

### Configuration Information - Factory Integration

**IMPORTANT:** The HP Cluster Platform, Cluster Platform Express and Cluster Platform Workgroup System are customized by HP and resellers using the Internal Configure-To-Order configurators process to receive a complete factory integrated cluster with options delivered in a single package. The Purchase Order must list each part number individually. The steps below describe the Factory Integration services provided during assembly and delivery of HP Cluster Platform Workgroup System

For a complete configuration of the HP BladeSystem, please do the following:

#### Step 1: Determine Hardware Factory Integration services

Factory Integration for HP Cluster Platform Workgroup System

Factory integration of all hardware components conforming to HP Cluster Platform Workgroup System configuration rules. This includes all networking and cluster test of these components at hardware level. Factory integration requires a hardware installation service per solution. An additional charge per node required if software installation is selected (Step 2)

A Hardware Integration service is required per Cluster Platform Workgroup System solution.

HP Factory Express Server System Custom SVC

HA839A1

#### Step 2: Determine Software Factory Installation Services

HPC Cluster Integration Service -

HP CPE Factory SW SVC Clustering Software Load for XC, CMU, ICE-Linux HP-MPI and SCALI (including OS) per compute node

HB488A

HP CPE Factory Linux OS Load SVC for Red Hat or SuSE distributions per compute node

HB489A

### Related Options

#### Software

##### OS Support

##### Linux

HPC RHEL 8-pack 2P 1Yr License	443934-B21
HPC RHEL 8-pack 2P 3Yr License	443935-B21
HPC RHEL Single Node 2P 1Yr License	443938-B21
HPC RHEL Single Node 2P 3Yr License	443939-B21
SUSE SLES10 1Yr Base Universal 8 pack, Media	431123-B21
SUSE SLES10 1Yr Universal Add-on 8 pack	431127-B21
SUSE SLES10 3Yr Universal Base 8 pack, Media	431128-B21
SUSE SLES10 3Yr Universal Add-on 8 pack	431129-B21
<b>NOTE:</b> HP Care Pack Services required for any part number above	
<b>Microsoft HPC Server 2008</b> (OS and cluster mgr)	
MS W2008 HPC Svr Npi FIO Eng SW	504103-B21

##### Cluster Management

<b>HP XC System Software V3.2.1</b> (includes OS)	
HP XC System Software Media and Manuals	434067-B21
HP XC System Software 1 Processor Flexible License	434066-B21
<b>NOTE:</b> The part numbers above do not include support contracts. Refer to next section.	
<b>NOTE:</b> Complete information on the XC System Software, including QuickSpecs, can be found at the following URL:	
<a href="http://www.hp.com/techservers/clusters/xc_clusters.html">http://www.hp.com/techservers/clusters/xc_clusters.html</a>	
<b>HP CMU</b>	
HP CMU License and Media	433257-B21
HP CMU Compute Node License	433258-B21
<b>HP Insight Control Environment for Linux</b>	
HP Insight Control Environment for Linux, 8-Server license, including one year of 24x7 Technical Support and Updates, FIO	464429-B21
<b>Scali Manage</b>	
Scali Manage Departmental Cluster Solution License / Node	432801-B21
Scali Manage 1Y Support Lic-Gold Support / Node	389400-B21
Scali Manage Educational Solution License / Node	389397-B21
<b>NOTE:</b> For three year support, please order quantity 3 of 1 year support options listed below.	

### Related Options

HP-MPI	HP-MPI for Linux Media Kit	433039-B21
	HP-MPI for Linux 4 Cores LTU	433028-B21
	HP-MPI for Linux 8 Cores LTU	433031-B21
	HP-MPI for Linux 256 Cores LTU	433034-B21
	<b>NOTE:</b> HP-MPI is also included with XC Software, so no separate purchase requirement if XC selected	
	HP-MPI for Windows Media Kit	433051-B21
	HP-MPI for Windows 4 Cores LTU	433040-B21
	HP-MPI for Windows 16 Cores LTU	433042-B21
	HP-MPI for Windows 128 Cores LTU	433045-B21
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<b>Service and Support Offerings</b> (HP Care Pack Services)	Red Hat Software Operating Environment Software Telephone, 1 Year 9x5 - 10 incident (Electronic)	U3402E
	Red Hat IA32,Software Technical Support, 1 Year 7x24 - 10 incident (Electronic)	U3406E
	SuSE IA, Software Technical Support, 1 Year 7x24 - 10 incident (Electronic)	U9935E
	SuSE IA, Software Technical Support, 1 Year 9x5 10 incident (Electronic)	U9936E
	HP 1 Year 9x5 10 Incidents MS/Novell Software Technical Support (per Windows cluster)	U9268E
	HP 1 Year 24x7 10 Incidents MS/Novell Software Technical Support (per Windows cluster)	U9269E
	Windows 1 Year 9x5 Unlimited Software technical Support (per node)	UF105E
	Windows 1 Year 24x7 Unlimited Software technical Support (per node)	UF106E
	Windows 3 Year 9x5 Unlimited Software technical Support (per node)	UF107E
	Windows 3 Year 24x7 Unlimited Software technical Support (per node)	UF108E
	HP XC Software 1 Year 9x5 1 processor Software Support	UF089E
	HP XC Software 1 Year 24x7 1 processor Software Support	UF090E
	HP XC Software 3 Year 9x5 1 processor Software Support	UF091E
	HP XC Software 3 year 24x7 1 processor Software Support	UF092E
	HP CMU one node 1 year 9x5 STS & Updates - unlimited	UE871E
	HP CMU one node 1 year 24x7 STS & Updates - unlimited	UF086E
	HP CMU one node 3 year 9x5 STS & Updates - unlimited	UF087E
	HP CMU one node 3 year 24x7 STS & Updates - unlimited	UF088E
	HP Insight Control Environment for Linux, 3 year, 24x7 Unlimited Software Support for 8 servers, including technical support and Software updates	UK131E
	HP-MPI for Linux or Windows 4 Cores LTU 1 Year 9x5 STS & Updates - unlimited	UF093E
	HP MPI for Linux or Windows 4 Cores LTU 1 Year 24x7 STS & Updates - unlimited	UF094E
	HP-MPI for Linux or Windows 4 Cores LTU 3 Year 9x5 STS & Updates - unlimited	UF095E
	HP-MPI for Linux or Windows 4 Cores LTU 3 Year 24x7 STS & Updates - unlimited	UF096E
	HP-MPI for Linux 32 Cores LTU 1 Year 9x5 STS & Updates - unlimited	UF101E
	HP-MPI for Linux 32 Cores LTU 1 Year 24x7 STS & Updates - unlimited	UF102E
	HP-MPI for Linux 32 Cores LTU 3 Year 9x5 STS & Updates - unlimited	UF103E
	HP-MPI for Linux 32 Cores LTU 3 Year 24x7 STS & Updates - unlimited	UF104E
	HP-MPI for Linux 256 Cores LTU 1 Year 9x5 STS & Updates - unlimited	UF113E
	HP-MPI for Linux 256 Cores LTU 1 Year 24x7 STS & Updates - unlimited	UF114E
	HP-MPI for Linux 256 Cores LTU 3 Year 9x5 STS & Updates - unlimited	UF115E
	HP-MPI for Linux 256 Cores LTU 3 Year 24x7 STS & Updates - unlimited	UF116E

### Related Options

HP-MPI for Windows 16 Cores LTU 1 Year 9x5 STS & Updates - unlimited	UF097E
HP-MPI for Windows 16 Cores LTU 1 Year 24x7 STS & Updates - unlimited	UF098E
HP-MPI for Windows 16 Cores LTU 3 Year 9x5 STS & Updates - unlimited	UF099E
HP-MPI for Windows 16 Cores LTU 3 Year 24x7 STS & Updates - unlimited	UF100E
HP-MPI for Windows 128 Cores LTU 1 Year 9x5 STS & Updates - unlimited	UF109E
HP-MPI for Windows 128 Cores LTU 1 Year 24x7 STS & Updates - unlimited	UF110E
HP-MPI for Windows 128 Cores LTU 3 Year 9x5 STS & Updates - unlimited	UF111E
HP-MPI for Windows 128 Cores LTU 3 Year 24x7 STS & Updates - unlimited	UF112E

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