



Linux Networkx  
 14944 Pony Express Road  
 Bluffdale, Utah, 84065, USA  
 ph:801 562 1010  
 fx:801 568 1010  
 1282005-dconner-ev64da-0591

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 Jim Prewett  
 University of New Mexico  
 1601 Central Avenue  
 Albuquerque, NM 87131  
 505-277-8210  
 download@ahpcc.unm.edu

Linux Networkx is pleased to offer a price quote for the system described below.

In summary, the following proposal reflects a fully integrated system of 64 nodes (Dual AMD processors) working together as a single system. Nodes are interconnected via Fast Ethernet switch, system(s) can also include high speed interconnects such as Infiniband, Quadrics and Myricom . The system consists of (64) rackmounted compute modules in (2) standard(4500 Series 42U) rack cabinet.

Linux Networkx is also pleased to offer our powerful cluster management tools (see Clusterworx Software and ICE Box Hardware Management Utility section). Our ICE Box and Clusterworx utilities provide power management, temperature monitoring, remote reset, disk cloning, and various other system management utilities. 45 days of Linux Networkx's 'Priority Plus' support and a one year warranty are included with each system. On site installation, extended warranties, and various other additional options are available.

#### Base Node Configuration System

Item	SKU#	Qty	Product description	Unit Price	Ext Price
1	1081	64	AMD Opteron, .8U Evolocity Solution System includes: *Evolocity .8U chassis *400W Power supply MFG# P1H-6400P *Heatsinks *Opteron Motherboard *Supports two AMD Opteron processors ONLY *AMD-8131 HyperTransport PCI-X Tunnel chipset *128-bit DDR memory bus *(8)184-pin 2.5-Volt DDR DIMM sockets *Supports up to 8GB Registered ECC DDR 266-333MHz SDRAM *(1) independent PCI-X buses *8MB ATI Rage XL PCI graphics controller *(2) Broadcom 5702 Gigabit Ethernet controller  NOTE- In order for this solution to operate in 64-bit mode, you must include a 64-bit O/S. Suse Linux is available in the system integration section for 64-bit support. By default, the Opteron solutions will include Redhat Linux and support 32-bit architecture unless Suse Linux is requested.  The .8U chassis will support AMD Opteron processors from 240 up to 250 with limitations. Due to thermal issues, Linux Networkx will only support the .8U chassis configured with AMD Opteron processors up to 250, that are cooled in an environment with a sustained temperatures of 25 Celsius or less. Please contact your Sales representative should you have questions.	Incl	Incl
2	1006	256	1GB PC2700 DDR Memory ECC REG	Incl	Incl
3	118	64	Seagate UDMA EIDE hard drive (80GB) 7200RPM 2MB Cache	Incl	Incl
4	127	64	GB Ethernet Cables--Copper	Incl	Incl
5	555	64	FOP/C, 2F50,DZIP,R,LCDX,REV 3mtr MFG# 482-537-010-S	Incl	Incl
6	1031	64	Myrinet-2000 Fiber/PCIX interfacePCI half height card (M3F-PCIXD-4)4MB MFG# M3F-PCIXD-4	Incl	Incl
7	9	64	PCI 64-Bit Riser card	Incl	Incl
8	709	64	LinuxBIOS and Cluster Management Utilities (per node price)	Incl	Incl

Includes:  
 CMOS\_util  
 –View BIOS settings remotely  
 –Save BIOS setting to a file  
 –Make changes to BIOS settings  
 –Error checking of BIOS options to prevent bad options being saved  
 LB Flash  
 –Flash the EPROM remotely while the machine is running  
 –Provides a failsafe copy with default settings

LinuxBIOS is an alternative to the factory BIOS that would normally come standard from the board manufacturer. LinuxBIOS was designed to run on high-performance systems i.e. clusters, and therefore excels in specific areas.

LinuxBIOS is extremely simple and, therefore quick booting. LinuxBIOS supports those CMOS settings germane to HPC such as: Hyperthreading, Memory Error Correcting Code (ECC), and serial BAUD rate setting. LinuxBIOS currently supports the ability to load an ELF Boot Image (EBI) consisting of a Linux Kernel and ramdisk via Network Interface Cards (NIC) or from an EBI placed on the first partition of the harddrive.

NOTE–  
 LinuxBIOS supports cluster wide firmware and CMOS updates via linux userspace utilities.

At the present time Linuxbios only supports headless (no Keyboard, Video, Mouse) operation. This means that systems running under LinuxBIOS must be monitored and accessed using a network or serial connection. Therefore, LinuxBIOS would not be a viable solution for a Cluster system host or any host which requires video, keyboard, and mouse access. Linuxbios is targeted for compute nodes. Limited video chipset support may be available in the future. It should also be noted that LinuxBIOS does not support PXE-boot and will not have PXE-boot support in the foreseeable future. LinuxBIOS includes Etherboot, which has driver support for many of the network devices supported under Linux.

9	1203 128	Opteron Desktop Model 246 (OSA246BOX) MFG# OSA246BOX	Incl	Incl
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Note: Each compute node configured with 4GB RAM (4 X 1GB DIMMS)

### Rack, Network, and Peripherals

Item	SKU#	Qty	Product description	Unit Price	Ext Price
1	183	1	Myrinet, 5U high, 9-slot enclosure for switch networks up to 64 hosts (M3-E64) ENCLOSURE	Incl	Incl
2	186	8	Myrinet, Line-card switch with 8 Fiber ports on the front panel and 8 SAN ports to the backplane (M3-SW16-8F)	Incl	Incl
3	188	1	Myrinet, Monitoring line card with dual Ethernet ports (top slot only) (M3-M) MFG# M3-M	Incl	Incl
4	135	1	HP Procurve Switch 4108GL (5U empty 8-slot chassis) J4865A MFG J4865A	Incl	Incl
5	137	3	HP Procurve 10/100-TX 24-port Module for HP4100GL Series Switches (J4862B) MFG#J4862B	Incl	Incl
6	209	2	LNXI, Cabinet 42U Height (will support 4 sub-chassis)	Incl	Incl
7	650	7	Vertical Sub-Cabinet for Evolocity .8U Systems	Incl	Incl

Note: Myrinet switch configured for future scalability to 32 ports.

### Master Host Node

Item	SKU#	Qty	Product description	Unit Price	Ext Price
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1	1107	1	AMD Opteron, 2U rack mount sever solution System includes: *2U chassis (LNXI PT# CPC-RM 2Uchass) *460W Power supply MFG# P2G-6460P *Heatsinks *Opteron Motherboard *Supports two AMD Opteron processors ONLY *AMD-8131 HyperTransport PCI-X Tunnel chipset *128-bit DDR memory bus *(8)184-pin 2.5-Volt DDR DIMM sockets *Supports up to 8GB Registered ECC DDR 266-333MHz SDRAM *(2) independent PCI-X buses *8MB ATI Rage XL PCI graphics controller *(2) Broadcom 5702 Gigabit Ethernet controller	Incl	Incl
2	1005	4	512MB PC2700 DDR Memory ECC REG	Incl	Incl
3	118	1	Seagate UDMA EIDE hard drive (80GB) 7200RPM 2MB Cache	Incl	Incl
4	127	1	GB Ethernet Cables--Copper	Incl	Incl
5	1488	1	ATEN, 1U rackmount 15IN LCD console, Keyboard, Mouse MFG Part number# CS1200L	Incl	Incl
6	266	1	3.5 Black Floppy Disk	Incl	Incl
7	1699	1	Slimline CD/DVD/RW MAS PT# DVR-K12RA Write speed: DVD-RW 2X, DVD-R 2X, DVD+R 2.4X, CD-RW 10X, CD-R 16X This component has not been fully tested with Linux Networkx products. Product availability will be dependent upon final testing. Linux Networkx reserves the right to substitute this product with a similar product once final test results are complete. Products not fully tested may include additional fees and delayed shipments.	Incl	Incl
8	1203	2	Opteron Desktop Model 246 (OSA246BOX) MFG# OSA246BOX	Incl	Incl

Note:

### Clusterworx Management Software

Item	SKU#	Qty	Product description	Unit Price	Ext Price
1	1802	1	Clusterworx 3.2 Cluster Master Node Management Software (price per host): *Comprehensive system monitoring (real time) including CPU usage, disk I/O, file system usage, kernel and OS information, load, memory usage, network information and bandwidth, swap usage, and more.  *Cluster overview and health status monitoring with automatic administrator notification through an extensible event subsystem.  *Powerful version-controlled image management with support for saving and logging revisions of multiple linux distributions and linux kernels.  *High-speed multicast provisioning for efficient loading of the OS and applications.  *ICE Box configuration and control featuring power management, temperature and basic motherboard monitoring, and serial access to each node.  *Integrated user management with support for NIS, LDAP, and Kerberos.  *GUI based parallel shell and parallel copy.	Incl	Incl
2	1803	128	Clusterworx 3.2 Cluster Management Software (price per processor): *Comprehensive system monitoring (real time) including CPU usage, disk I/O, file system usage, kernel and OS information, load, memory usage, network information and bandwidth, swap usage, and more.  *Cluster overview and health status monitoring with automatic	Incl	Incl

administrator notification through an extensible event subsystem.

\*Powerful version-controlled image management with support for saving and logging revisions of multiple linux distributions and linux kernels.

\*High-speed multicast provisioning for efficient loading of the OS and applications.

\*ICE Box configuration and control featuring power management, temperature and basic motherboard monitoring, and serial access to each node.

\*Integrated user management with support for NIS, LDAP, and Kerberos.

\*GUI based parallel shell and parallel copy.

Note:

### ICE Box Hardware Management Utility

Item	SKU#	Qty	Product description	Unit Price	Ext Price
1	1694	7	Integrated Cluster Environment (ICE) Box, supports up to 40AMPS, Rev. 4	Incl	Incl

Note:

### System Integration (Required to Build Systems and Load Software)

Item	SKU#	Qty	Product description	Unit Price	Ext Price
1	252	1	Cluster Software & System Integration *Pre-loaded/configured Red Hat Linux *Pre-loaded/configured PVM and MPI *Pre-loaded/configured PBS v2.3.14, (Includes one working default FIFO queue, and one root user) *S/W load, System integration, testing in-house, and burn-in, System documentation/CD-ROM	Incl	Incl
2	1477	65	SuSE 9 Professional	Incl	Incl

Note:

### Service and Support

Item	SKU#	Qty	Product description	Unit Price	Ext Price
1	239	1	12-Month - Priority Plus Service / Support Contract *45 days of Priority Plus (Included with purchase of any cluster system) *30 days dedicated engineering support (Included with purchase of any cluster system) *1-year hardware warranty *Unlimited Online Support *Phone and Fax Support *ClusterworX Upgrades *Automatic Update Notification *ClusterworX Upgrade on CD-ROM *Optional Spares	Incl	Incl

Note:

Grand Total: \$ 365,295.00

Be sure to ask your sale representative about our Cluster training courses:  
Cluster System Fundamentals  
Migrating to Clusters for High Performance Computing (HPC)  
Storage and Filesystems

Resource and Job Management  
Linux Networkx Cluster System Administration  
Introduction to MPI  
Advanced MPI

Prices are in USD and are FOB Salt Lake City, Utah. Standard delivery is 4–6 weeks ARO. All cluster purchases must include order acknowledgement (Purchase Order) and required documentation (Integration Questionnaire, when applicable) before Linux Networkx acceptance. All products and services quoted do not include freight costs for delivery, unless freight fees are clearly identified in the quote. Linux Networkx reserves the right to run cluster performance tests and submit collected data at will, unless written notice is provided. Persons receiving the quoted product are responsible for paying any and all freight costs. Linux Networkx will prepay freight costs and include these costs with the final invoice unless purchase order specifies a preferred carrier. All invoices must be paid within 30–days of invoice date (30–day net term must be pre–approved). Memory prices are subject to change and are valid for 7–days only.

All purchases outside North America are paid before shipment unless otherwise negotiated through your Linux Networkx account representative.

Thank you for the opportunity to provide pricing information on these products and services Please contact me with any questions at 510–749–0166 or Dusty Kramer at 801–649–1249.

Best regards,  
Danielle Conner  
Linux Networkx