Introduction

There are three ways to put together a cluster computing solution for your customer.

1) Selling standard desktop workstations (to build a "desktop" cluster) and referring to third parties for most of the enabling cluster software.

2) Selling a dedicated cluster—i.e., as a collection of components—so customers can configure a system to their specific requirements. Most of the enabling software is also referenced to third parties.

3) Selling a pre-assembled dedicated cluster from the factory. Here again most of the enabling software is referenced to third parties.

Note: Pricing for FDDI in a cluster of 735 workstations will be available from the Custom Products Group Hotline: TN or (508) 436-4999.

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Configuring and Ordering a "Desktop" Workstation Cluster

A "desktop cluster" is simply a standard group of networked workstations that, with the right software, can also be used to process batch or parallel jobs in addition to the interactive jobs they were mainly purchased for. As usual, refer to Series 700 Pricing and Configuration Guide (Part # 5091-7550EUS) for ordering information on the workstation products, Task Broker, and the HP system administration software. For third-party software, refer to the end of this guide for contact and pricing information.

Configuring and Ordering a Dedicated Workstation Cluster
Typically, a dedicated computational cluster is made up of several headless work-stations, usually in even numbers (4, 8, 12). The customer builds the cluster himself with headless workstation and his own networks. We have facilitated the ordering of systems that can be clustered by offering certain delete options that remove re-dundant hardware (the monitor and graphics card) from workstations used in a cluster. Most computational cluster applications require the highest performing workstation in a desktop package, so the 735 system is preferred. The 755 server is included for those applications requiring very large RAM and expansion capabili-ties, although the 755 cannot be racked.

Computational Cluster Base Modules

Product Number	Model Description	US List Price
A2608A	735 CRX color workstation 32MB RAM One 1GB disk	$38,940
007	Delete monitor & graphics	($4,000)
		$34,940
A2551A	755 CRX color workstation 64MB RAM One 2.0GB disk	$58,890
007	Delete monitor & graphics	($4,000)
		$54,890

Add–Ons
Of course each of these building block systems can be enhanced with all the same options any other Series 700 workstation can offer. Options like more RAM, disk, disk-arrays, etc. Refer to Series 700 Pricing and Configuration Guide (Part # 5091-7550EUS) for ordering information on these options.

Console
We recommend that the customer purchase a workstation to serve as a console to administer the workstations in the cluster (the customer may choose to use an ex-isting workstation if he prefers). We recommend ordering a 715/50 because of its price/performance leadership and expandability. Customers may prefer a more powerful workstation if the console will also be used as a file server. You have the option of either an intenal CD-ROM or DAT tape (but not both) on the 715/50. You may order an external DAT and CD-ROM drive in addition.

Computational Cluster Console

Product Number	Model Description	US List Price	
A2627A	715/50 color workstation 16MB RAM One 525MB disk	$13,890	
AMW	Add 2 GB 3.5" DDS SCSI-II	$2,625	
A1099C	Localization kit		$105
			$16,620

Networking

A critical option for a computational cluster is the network connection between machines in the cluster. Most applications, especially those using a cluster as a batch throughput engine, can make do with standard Ethernet. And as you know, Ethernet is already included with every Series 700 system at no extra charge. For convenience, you can order requisite Media Adapter Units. For applications that require higher bandwidth, select the FDDI option listed below. An FDDI concentrator is also required. The preferred concentrator is the DEConcentrator 500 from Digital Equipment Corporation. Depending on configuration, they cost on the order of $20,000. They can be ordered directly from Digital (1-800-DIGITAL). Finally, a terminal server is handy to have. It allows the control workstation to monitor each workstation in the cluster and plugs directly into the cluster console's EISA port.

FDDI Networking Option (Models 735 & 755 Only)

Option Number	Model Description	US List Price
009	FDDI/9000 option for Model 735 and Model 755	$2,000 (each)

Rack Cabinets

So your customer can keep all these workstations that make up a computational cluster in one place, we are offering rack cabinets to hold up to eight Model 735 workstations. As you know, the 735 systems were not designed to be rack mountable, so we have added special mounting hardware to a standard HP rack cabinet to hold the systems securely.

Rack Cabinets

Product Number	Model Description	US List Price
S2292A	1.6m HP rack cabinet modified to hold up to 8 Model 735 workstation units	$3,800

Configuring and Ordering a Pre-assembled Cluster

HP will assemble four or eight 735 systems in a rack with all the networking and cables included. We will also load Task Broker. To order a pre-assembled cluster, start with the 735 cluster modules, then you need to order the rack and the system integration services. You may also want to order a cluster console. As part of the system integration, you must define whether the network will be Ethernet or FDDI. Ethernet integration is option S00 (S as in SAM, zero, zero) and includes a thin net hub, a terminal server and cables. If you want more than eight workstations in a cluster, you must order a second rack. FDDI systems integration has not been priced yet; please call the Custom Products Hotline (TN or 508-436-4999) for a quote for FDDI. The systems integration will contain enough cables to handle eight workstations (for future expansion). The rack and integration services are discountable.

Computational Cluster Base Modules

Product Number	Model Description	US List Price
A2608A	735 CRX color workstation 32MB RAM , One 1GB disk	$38,940
007	Delete monitor & graphics	($4,000)
S01	Delete manuals & outer packing	N/C
		$34,940

FDDI Networking Option (Models 735 Only)

Option Number	Model Description	US List Price
TBD	FDDI integration	TBD
009	FDDI/9000 option for Model 735	$2,000 (each)

Rack Cabinet and System Integration

Product Number	Model Description	U.S. List Price
S2292A	1.6m HP rack cabinet modified to hold up to 8 Model 735 workstation units	$3,800
S00	Ethernet systems integration	$11,500
S02	Task Broker installation	N/C*
S04	U.S. power localization	N/C
S05	European power localization	N/C

* Task Broker must also be ordered via product number B1740L (10 node license), B1741L (50 node license) or B1742L (site license).

Note: Currently the cluster is not shipped in the rack. The workstation nodes must be loaded into the rack once they arrive at the customer site. Although this is a fairly simple process (the mounting hardware and cables are already installed), you may want to retain an SE or a CE to provide onsite set up services.

The following information is applicable to all of the products listed above:

Product line:	5X
Sales force:	AS APPLICABLE
Supplier:	J600
Marketer:	J600

Sample Ordering Instructions for Pre-assembled Cluster

1. Order S735 workstations and any associated standard options as you would a regular order. PLEASE INCLUDE THE FOLLOWING CUSTOM OPTIONS TO THE S735/S730 CONFIGURATION:

Example:	A2608A
Special Option Number:	S01 ("S" as in Sam, zero ,one)
Description:	deletes documentation/outer packaging
Price:	No additional charge

   NOTE: Option number S01 MUST be selected with the A2608A

Option Number:	007 (zero zero seven)
Description:	deletes monitor and graphics card
Price:	$4,000 credit

ECMO IS THE SUPPLIER FOR U.S. & NON-U.S. CLUSTER (S700) HARDWARE ORDERS; PRECAUTION MUST BE TAKEN TO OVERRIDE THE SYSTEM TO REFLECT DIVISION J600 AS THE SUPPLIER.

2. Order the Rack next:
   Example: S2292A
   Description: 1.6m rack
   List Price: $3,800
   Special Option Number: S04 ("S" as in Sam, zero, four)
   List Price of S04: N/C
   Description: U.S. Power Localization

   Discountable: Yes— per customer agreement

   NOTE: Option number S04 MUST be selected with the
              S2292A for U.S. localization.

   For non-U.S. customers, power localization will be configured
   at the customer's location.

3. Order Systems Integration:
   Example: S2292A Option # S00 ("Sam," zero, zero)
   Description: Factory Systems Integration
                       for up to 8 735 workstations
   List Price of S00: $11,500
   Discountable: Yes—per customer agreement

   NOTE: Option # S00 S2292A MUST be ordered
              to ensure factory systems integration.

   The customer may order the rack only [S2292A] and no systems
   integration (# S00) if they elect to do so.

4. Order a Console Workstation:
   This can be any Series 700 workstation from the CPL.

Software Pricing
Here is U.S. List pricing for the software. Contact each vendor directly for detailed pricing.

Company	Product	Unit Price (Per node)	10 Nodes
Convex	ConvexNQS+	$1,250	$4,750*
	ConvexPVM	$2,600	$9,500*
	ConvexNSQ+ and		
	ConvexPVM	$3,375	$12,825*
	ConvexMLIB	$4,995	$25,000*

* 8 node price

Company	Product	Unit Price (Per node)	10 Nodes
Sterling	NQS 2.2	$495	$4,700
	NQS/Exec 2.2	$795	$7,550
HP	TaskBroker	—	$5,000
Freedman Sharp & Assoc.	Load Balancer	$299	$1,500 (Site License)
Scientific Computing Assoc	Network Linda	$1,000	$4,995
Isis Distributed Systems	Isis Distributed Toolkit	$500 $2,500	$5,000 $25,000
Oak Ridge National Lab	PVM	$0	$0
	HeNCE	$0	$0
Parasoft	Express	Contact Parasoft	
Applied Parallel Research	Forge90	$2,405	$22,295
Torque Systems, Inc	Tuplex	Contact Torque	

Contacting Third-party Cluster Software Companies

Contact information for the various third-party solution suppliers is listed below.

Product	Contact	Company	Phone
Linda	Leigh Cagan	Scientific Computing Associates One Century Tower 265 Church Street New Haven, CT 06510	203-777-7442 203-776-4074 (FAX)
NQS	Thomasine Bailey	Sterling Software 1121 San Antonio Road Palo Alto, CA 94303	415-964-9900 415-969-3821 (FAX)
ConvexNQS+ ConvexPVM ConvexMLIB	Blair Baker	Convex Computer Corp. 3000 Waterview Parkway P.O. Box 833851 Richardson, TX 75083	214- 497-4000 214-497-4848 (FAX)
Express	Bill Rodart	Parasoft 2500 E. Foothill Blvd Suite 205 Pasadena, CA 91107	818-792-9941 818-792-0819 (FAX)
Isis	Pamela Salvaggio Rick Moran	Isis Distributed Systems Suite 200 111 Cayuga Street Ithaca, NY 14850	607- 272-6327 607-277-2611 (FAX)
Load Balancer	Dan Freedman	Freedman Sharp and Assoc. 204 Woodglen Place S.W. Calgary, Alberta T2W 4G3	403-251-2729 403-281-0204 (FAX)
PVM	netlib@ornl.gov (e-mail)	Oak Ridge National Laboratory Oak Ridge, TN	
Forge90	Robert Enk	Applied Parallel Research 5500 Lambeth Road Bethesda, MD 20814	301-718-3733 301-718-3734(FAX)
Tuplex	Scott Rafer	Torque Systems, Incs 825 Emerson St. Palo Alto, CA 94301	415-321-1200 415-321-1298(FAX)
Parasol	Peter Hunt	Parasol 440 EAgle Crest Drive Scotts Valley, CA 95066	408-354-9535