Building High Performance Computers Out of Standards-Based Components

Now, more than ever, technology is capable of powering the most intense research and business applications. And High Performance Computing Clusters have emerged as an exciting alternative to expensive supercomputers. Yet, how do you effectively harness this capability and make the most of it in your environment?

Dell HPCC solutions put the best technology at your fingertips easily and for a fraction of the cost of traditional supercomputers. Delivering cutting-edge technology and performance at an amazing price, Dell HPCC solutions provide the power necessary for your most demanding projects at an exceptional value.

Dell Delivers a Complete HPCC Solution

Through a combination of industry-standard hardware, the most advanced processor technology, software solution and excellent service and support, Dell provides an end-to-end HPCC solution tailored to meet the challenges of your high performance environment. Our comprehensive lines of Intel®-based servers, robust storage and high-bandwidth networking products allow you to build a fast, flexible, reliable cluster solution that is easy to manage.

Visit www.dell.com/clusters for more information.
Dell Clustering Solutions Are Designed to Make HPCC Easier, Faster and Simpler

Powerful, incredibly affordable industry-standard components form the building blocks of the Dell HPCC architecture. This modularity offers many advantages. It gives you the flexibility to build a system that addresses your specific needs. It also enables you to purchase what you can afford today, with the ability to grow as your problems or resources change. Plus, any piece of the solution can be easily replaced as technology advances and the components can be reused in other applications to help protect your investment. It also enables quick and simple deployment and easy ongoing manageability.

Giving you Choice and Flexibility

Dell will work carefully with you to build a cluster that takes full advantage of our available technology. Of the many configuration options available, Dell offers solutions built with PowerEdge™ 1750, PowerEdge 2650, PowerEdge 3250 and PowerEdge 1655MC servers. The cluster is based on either Fast Ethernet or Gigabit Ethernet network connections. PowerEdge 1750, 2650, 3250 and 1655MC configurations can be deployed from our prepackaged solutions with as many as 128 nodes in a cluster. Our custom configurations are available through Dell Professional Services and can be customized to your sizing needs.

For customers with applications requiring a High Speed Low Latency interconnect for node-to-node communications, Dell provides Myricom’s Mryinet technology through custom offerings.

“Even if a company must buy thousands of processors to attain the raw power of a supercomputer, making the switch often makes financial sense. First, the price per processor is far less in a cluster. For example, an IBM Regatta, which is a supercomputer-class Unix machine with 64 processors that CGG Americas used in the late 1990s, cost the company $1.5 million to $2 million. Two years ago, by comparison, CGG Americas paid Dell $830,000 for an initial cluster of 256 machines, or 512 processors. That’s about $31,250 per processor for the supercomputer compared to $1,621 per processor for the cluster.”

Baseline, December 2002
Centers of Research Excellence

Each year Dell recognizes innovative uses of HPCC in academic, commercial and government applications, projects and research through the Dell Centers of Research Excellence program. The award is based on the following criteria:

— Innovation in HPCC applications or solutions
— Size and scope of the cluster
— Applications and types of research

The Cornell Theory Center received Dell’s Center for Research Excellence award in October 2002 for their clusters of 64 Dell PowerEdge servers with a total of 256 processors on Microsoft® software. “CTC is receiving this award due to their groundbreaking research and for their pioneering role in the use of clustering technology,” said Michael Dell, CEO of Dell.

Congratulations to The University of Buffalo, State University of New York, this year’s winner, recognized for their cluster of 2,000 PowerEdge servers for bioinformatics research.

Case Study: Pennsylvania State University

Walk into almost any academic building these days on the Pennsylvania State University campus, and you’ll find researchers smiling. They’re getting a boost from the university’s newest Dell-based computing cluster operating at the university’s Center for Academic Computing. The cluster consists of 128 PowerEdge 1550 servers, with a total of 256 processors, and runs on the Red Hat Linux operating system. Researchers use a large number of application programs for their research. Low-cost Dell clusters stretch Pennsylvania State’s budget and extend the benefits of high-performance computing to more researchers.

In choosing Dell as the supplier for its cluster servers, PSU considered a number of factors: initial price, ease of maintenance, reliability, footprint, and form factor. “We already had a strong relationship with Dell, so we were confident we would be well supported,” says Vijay Agarwala, Director of PSU’s High Performance Computing and Visualization Group. “Dell’s pricing was very competitive, and they had a range of servers that met our specifications. Their systems have sufficient redundancy, meeting our needs for uptime and recovery. Finally, we needed a rack-mountable system to match our physical space requirements, and the PowerEdge line is well suited to that kind of setup.” The new LION-XE cluster consists of 128 PowerEdge 1550 servers, which is an ultra-thin 1U system. PSU’s PowerEdge 1550 servers are configured with dual Intel Pentium® III processors running at 1GHz and equipped with 2GB RAM and a 36GB* SCSI hard drive. “Because the PowerEdge 1550 is so slim and the processors are more powerful than those in our first cluster, we’re getting eight times the power per square inch,” Agarwala says. “You just don’t see those kinds of rapid price/performance advances in the proprietary world.”

Dell Cluster Solutions. Easy as Dell

Dell HPCC Products: Advanced Technology for Your Advanced Research Projects

Visit www.dell.com/clusters to view validated configurations, special offers, technical white papers, case studies and more.

PowerEdge 1750 Servers
- Ultra-thin 1U form factor
- Up to two Intel® Xeon® processors with Hyper-threading technology
- Up to 438GB internal storage capacity
- Up to 8GB of 266MHz ECC DDR SDRAM
- ServerWorks® GC-LE chipset utilizes 533MHz front side bus, 2:1 memory interleaving for fast memory

PowerEdge 2650 Servers
- Rack-dense 2U form factor
- Up to two Intel Xeon processors with NetBurst Micro-architecture with Hyper-Threading support
- Up to 365GB internal storage capacity
- Up to 12GB ECC DDR SDRAM
- ServerWorks GC-LE chipset utilizes 533MHz front side bus, 2:1 memory interleaving for faster memory access

PowerEdge 3250 Servers
- Rack-dense 2U form factor
- Up to two Intel Itanium 2 processors
- Up to 292GB internal storage capacity
- Up to 16GB of 266MHz ECC DDR SDRAM
- Intel E8870 chipset utilizes 400MHz front side bus

PowerEdge 1655MC Servers
- 3U enclosure holds up to six server blades
- Up to two Intel Pentium® III processors
- 146GB (2 x 73GB) maximum internal storage
- Up to 2GB 133MHz ECC SDRAM
- ServerWorks ServerSet LE3.0

PowerConnect® Network Switches
- Ethernet and Gigabit options
- Enterprise-class reliability and performance
- Standards-based
- A wide range of port number options: 8, 16, 24, or 28
- Contact your Dell Technical Sales Representative for recommendations.

Operating Systems
Option of Red Hat Linux or Microsoft® Windows® 2003

Build the HPCC solution that is right for you

Call your Dell sales representative to build a clustering solution that is right for your organization’s intense computation needs. Visit www.dell.com/clusters or call 1-800-www-dell for more information.

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