AMAX’s ClusterMax™ Workgroup HPC Cluster was engineered as a space-saving, versatile cluster architecture that addresses today’s need for a high performance, high-density mobile cluster, enabling smaller workgroups to handle larger and more complex workloads outside of the datacenter with limited IT support. High performance, multi-processor and multi-core compute servers let you run more individual jobs concurrently and reduce time-to-solution for individual, parallelized jobs – all in a workgroup environment. Based on the 22nm 18-core Intel® Xeon® E5-2600 v3, 12-core Intel® Xeon® E5-2600 v2, or AMD Opteron 6300 processor series, the ClusterMax™ Workgroup features up to 720 Intel Xeon® 640 AMD Opteron processor cores, or 104,832 Tesla K80 GPU cores, 117+ Teraflops of single precision performance and 39+ Teraflops of double precision performance per 14U standard rack cabinet, doubling the density compared with traditional rack mounted servers.

The ClusterMax™ Workgroup is ideal for workgroups or small sites running HPC applications in computer-aided engineering, oil & gas, financial services, and life and material sciences, and requires no special power or cooling. The result: with the ClusterMax™ Workgroup, you own the computing power you need to improve productivity, reduce design and development cycles, speed computation, improve efficiency, and reduce the cost of innovation.

Cluster Specifications:
- Mobile/modular, and space-saving 14U HPC cluster, with support for up to:
- 720 Intel Xeon® E5-2600 v3 processor cores,
- 640 AMD Opteron processor cores, or 104,832 Tesla K80 GPU cores, 117+ Teraflops of single precision performance and 39+ Teraflops of double precision performance
- Onboard IPMI 2.0 with KVM over IP and remote Virtual Media over LAN, enabling ease of management and control
- Highest power efficiency – 93% efficiency earth-friendly power supply

Applications:
- Bio-chemical / Biotechnology / Life Sciences
- Computational grid endpoint
- Computer-aided engineering (CAE)
- Computational fluid dynamics (CFD)
- Data mining and stream processing
- Electronic design automation (EDA)
- Financial market modeling
- HPC applications (eg. Nastran, Ansys, LS-Dyna)
- Metrology
- Petro-clusters / oil & gas
- Server consolidation
- Scientific research
- Simulations
- Visualization / rendering modeling
- Web hosting
- Yield Optimization

Cluster Features:
- Delivers high availability, scalability, flexibility and power efficiency in a dense cluster architecture
- Improves RAS with hot-swappable and redundant fans, and hard disk drives
- Addresses today’s natural business growth of mid to large-sized HPC and high-density computing
- Lowest TCO for support, maintenance and upgradeability
- Ideal for mid- to large data centers scaling up to 1,000 nodes

Complete Cluster Assembly and Set Up Services:
- Fully integrated and pre-packaged turnkey HPC solution, including HPC professional services and support, expert installation and setup of rack-optimized cluster nodes, cabling, rails, and other peripherals
- Configuration of cluster nodes AND the network
- Installation of applications and clients computers to offer a true replacement of customer's IT department
- Rapid deployment
- Server management options include Standards-based IPMI or AMAX remote server management
- Seamless standard and custom application integration & cluster installation
- Cluster management options include a choice of open source software solutions using Rocks+ and MOAB
- Firmware upgrades & BIOS modification
- Supports a variety of UPS and PDU configuration and interconnect options, including DQR/FDR Infiniband, Intel True Scale, Fibre channel, and Ethernet (Gigabit, 10GbE/40GbE)

Clustered File Storage (from Terabyte to Petabyte):
- Hardware design & software stack
- Lustre / Open source file system (Redundancy across system nodes)

Rack Level Verification
- Performance and Benchmark Testing (HPL)
- ATA rack level stress test
- Rack Level Serviceability
- Ease of Deployment Review
- MPI jobs over IB for HPC
- GPU stress test using CUDA
- Cluster management

Large Scale Rack Deployment Review
- Scalability Process
- Rack to Rack Connectivity
- Multi-Cluster Testing
- Software/Application Load
- Cluster management

Optional Cluster System Software Installed:
- Intel Cluster Ready, Microsoft Windows Server 2012
- Bright Computing Cluster Manager
- SuSE / Red Hat Enterprise Linux, Red Hat Enterprise MRG
- IBM Platform Cluster Manager, IBM Platform HPC Enterprise, IBM Platform LSF
- Beowulf Cluster, Lustre/Cluster, Rocks cluster
- OSCAR (The Open Source Cluster Applications Resources) clustering software
- High availability/failover cluster
- Virtualization cluster, Visualization cluster
- C-based software development tools, CUDA 6.x Toolkit and SDK, and various libraries for CPU GPU clusters
- Intel® Xeon Phi™ Coprocessor Many-core Platform Software Stack (MPSS)
## Pre-Configured ClusterMax™ Workgroup Cluster Specifications:

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<tbody>
<tr>
<td><strong>Number of Nodes</strong></td>
<td>Seven dual socket 22nm E5-2600 v3 or 12-core Intel® Xeon® E5-2600 v2 processors</td>
<td>Seven dual socket AMD Opteron 6300 series nodes</td>
<td>Seven dual processor Nvidia Tesla K40/K20/X GPUs (with 56,448 GPU cores, up to 82.95 Teraflops of single precision performance and 27.72 Teraflops of double precision performance)</td>
<td>Seven dual processor Nvidia Tesla K80 GPGPU nodes</td>
</tr>
<tr>
<td><strong>Compute Node CPUs</strong></td>
<td>- 720 cores with 14x Xeon® E5-2600 v3 processors or 480 cores with 14x Xeon® E5-2600 v2 processors</td>
<td>640 cores with 14x AMD Opteron 6300 series processors</td>
<td>- 14x dual socket 22nm 18-core Intel® Xeon® E5-2600 v3 or 12-core Intel® Xeon® E5-2600 v2 processors, with up to 224 processor cores per 14U cabinet</td>
<td>- 14x dual socket 22nm 18-core Intel® Xeon® E5-2600 v3 processors, with up to 224 processor cores per 14U cabinet</td>
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<tr>
<td><strong>Compute Node Memory</strong></td>
<td>Up to 10TB DDR4 2133MHz or DDR3 1866/1333/1066/800MHz memory (512GB per node)</td>
<td>Up to 10TB DDR3 1866/1333/1066/800MHz memory (512GB per node)</td>
<td>Up to 3.5TB DDR4 2133MHz or DDR3 1866/1333/1066/800MHz memory (512GB per node)</td>
<td>Up to 3.5TB DDR4 2133MHz or DDR3 1866/1333/1066/800MHz memory (512GB per node)</td>
</tr>
<tr>
<td><strong>Compute Node Storage</strong></td>
<td>One dual socket 22nm 18-core Intel® Xeon® E5-2600 v3 or 12-core Intel® Xeon® E5-2600 v2 storage node</td>
<td>One dual socket 22nm 18-core Intel® Xeon® E5-2600 v3 or 12-core Intel® Xeon® E5-2600 v2 storage node</td>
<td>One dual socket 22nm 18-core Intel® Xeon® E5-2600 v3 or 12-core Intel® Xeon® E5-2600 v2 storage node</td>
<td>One dual socket 22nm 18-core Intel® Xeon® E5-2600 v3 or 12-core Intel® Xeon® E5-2600 v2 storage node</td>
</tr>
<tr>
<td><strong>Storage Node CPUs</strong></td>
<td>36 cores with 2x Xeon® E5-2600 v3 processors or 24 cores with 2x Xeon® E5-2600 v2 processors</td>
<td>2 dual-socket AMD Opteron 6300 series processors</td>
<td>36 cores with 2x Xeon® E5-2600 v3 processors or 24 cores with 2x Xeon® E5-2600 v2 processors</td>
<td>36 cores with 2x Xeon® E5-2600 v3 processors or 24 cores with 2x Xeon® E5-2600 v2 processors</td>
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<tr>
<td><strong>Storage Node Memory</strong></td>
<td>Up to 512GB DDR4 2133MHz or DDR3 1866/1333/1066/800MHz memory (512GB per node)</td>
<td>Up to 512GB DDR3 1866/1333/1066/800MHz memory (512GB per node)</td>
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<tr>
<td><strong>Storage Node Storage</strong></td>
<td>Up to 72TB hot-plug SATA, SAS, or SSD storage capacity</td>
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<tr>
<td><strong>Network Connectivity</strong></td>
<td>GbE connectivity on each node</td>
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<td>QDR/FDR InfiniBand connectivity on each node</td>
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<tr>
<td><strong>Network Switch</strong></td>
<td>1x 16-port GbE Ethernet switch</td>
<td>One 16-port GbE Ethernet switch</td>
<td>One 16-port 10GbE Ethernet switch</td>
<td>One 16-port 10GbE Ethernet switch</td>
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<tr>
<td><strong>Infiniband Switch</strong></td>
<td>Optional InfiniBand switch</td>
<td>Optional InfiniBand switch</td>
<td>One 18-port QDR/FDR InfiniBand switch</td>
<td>One 18-port QDR/FDR InfiniBand switch</td>
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<tr>
<td><strong>Cluster Software</strong></td>
<td>IBM Platform Cluster Manager, Bright Cluster Manager software options with 1-year or 3-year support</td>
<td>IBM Platform Cluster Manager, Bright Cluster Manager software options with 1-year or 3-year support</td>
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