## SPEC® MPI2007 Result

**SGI**

SGI Altix ICE 8200EX  
(Intel Xeon X5570, 2.93 GHz)  

<table>
<thead>
<tr>
<th>SPECmpim_base2007</th>
<th>SPECmpim_peak2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.80</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**MPI2007 license:** 4  
**Test sponsor:** SGI  
**Tested by:** SGI  

**Test date:** Feb-2009  
**Hardware Availability:** Mar-2009  
**Software Availability:** Jan-2009

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</table>

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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SPEC MPIM2007 Result

SGI

SGI Altix ICE 8200EX
(Intel Xeon X5570, 2.93 GHz)

SPECmpiM_peak2007 = Not Run
SPECmpiM_base2007 = 1.80

Test date:    Feb-2009
Hardware Availability: Mar-2009
Software Availability: Jan-2009

Results Table (Continued)

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<tr>
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<td>1.45</td>
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<td></td>
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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Hardware Summary
Type of System: Homogeneous
Compute Node: SGI Altix ICE 8200EX Compute Node
Interconnects: InfiniBand (MPI)
InfiniBand (I/O)
File Server Node: SGI InfiniteStorage Nexis 2000 NAS
Total Compute Nodes: 1
Total Chips: 2
Total Cores: 8
Total Threads: 16
Total Memory: 48 GB
Base Ranks Run: 8
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary
C Compiler: Intel C Compiler for Linux
Version 10.1, Build 20080801
C++ Compiler: Intel C++ Compiler for Linux
Version 10.1, Build 20080801
Fortran Compiler: Intel Fortran Compiler for Linux
Version 10.1, Build 20080801
Base Pointers: 64-bit
Peak Pointers: 64-bit
MPI Library: SGI MPT 1.23
Other MPI Info: OFED 1.3.1
Pre-processors: None
Other Software: None

Node Description: SGI Altix ICE 8200EX Compute Node

Hardware
Number of nodes: 1
Uses of the node: compute
Vendor: SGI
Model: SGI Altix ICE 8200EX (Intel Xeon X5570, 2.93 GHz)
CPU Name: Intel Xeon X5570
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 8
Cores per chip: 4
Threads per core: 2
CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz, 6.4 GT/s QPI, Hyper-Threading enabled
CPU MHz: 2934
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 8 MB I+D on chip per chip
Other Cache: None
Memory: 48 GB (12*4GB DDR3-1066 CL7 RDIMMs)
Disk Subsystem: None
Other Hardware: None
Adapter: Mellanox MT26418 ConnectX IB DDR (PCIe x8 Gen2 5 GT/s)
Number of Adapters: 1

Software
Adapter: Mellanox MT26418 ConnectX IB DDR (PCIe x8 Gen2 5 GT/s)
Adapter Driver: OFED-1.3.1
Adapter Firmware: 2.5.0
Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP2
Kernel 2.6.16.60-0.30-smp
Local File System: NFSv3
Shared File System: NFSv3 IPoIB
System State: Multi-user, run level 3
Other Software: SGI ProPack 6 for Linux Service Pack 2

Continued on next page
### SPEC mpiM2007 Result

**SGI**

**SGI Altix ICE 8200EX (Intel Xeon X5570, 2.93 GHz)**

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<td><strong>Software Availability:</strong> Jan-2009</td>
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</table>

#### Node Description: SGI Altix ICE 8200EX Compute Node

- **Slot Type:** PCIe x8 Gen2
- **Data Rate:** InfiniBand 4x DDR
- **Ports Used:** 2
- **Interconnect Type:** InfiniBand

#### Node Description: SGI InfiniteStorage Nexis 2000 NAS

**Hardware**

- **Number of nodes:** 1
- **Uses of the node:** fileserver
- **Vendor:** SGI
- **Model:** SGI Altix XE 240 (Intel Xeon 5140, 2.33 GHz)
- **CPU Name:** Intel Xeon 5140
- **CPU(s) orderable:** 1-2 chips
- **Chips enabled:** 2
- **Cores enabled:** 4
- **Cores per chip:** 2
- **Threads per core:** 1
- **CPU Characteristics:** 1333 MHz FSB
- **CPU MHz:** 2328
- **Primary Cache:** 32 KB I + 32 KB D on chip per core
- **Secondary Cache:** 4 MB I+D on chip per chip
- **L3 Cache:** None
- **Other Cache:** None
- **Memory:** 24 GB (6*4GB DDR2-400 DIMMS)
- **Disk Subsystem:** 7 TB RAID 5
  - 48 x 147 GB SAS (Seagate Cheetah 15000 rpm)
- **Other Hardware:** None
- **Adapter:** Mellanox MT25208 InfiniHost III Ex (PCIe x8 Gen1 2.5 GT/s)
- **Adapter Driver:** OFED-1.3
- **Adapter Firmware:** 5.3.0
- **Operating System:** SUSE Linux Enterprise Server 10 (x86_64) SP1
  - Kernel 2.6.16.54-0.2.5-smp
- **Local File System:** xfs
- **Shared File System:** --
- **System State:** Multi-user, run level 3
- **Other Software:** SGI ProPack 5 for Linux Service Pack 5

**Software**

- **Vendor:** Mellanox Technologies
- **Model:** MT26418 ConnectX
- **Switch Model:** Mellanox MT47396 InfiniScale III
- **Number of Switches:** 8
- **Number of Ports:** 24
- **Data Rate:** InfiniBand 4x DDR
- **Firmware:** 2020001

### Interconnect Description: InfiniBand (MPI)

**Hardware**

| **Vendor:** Mellanox Technologies |
| **Model:** MT26418 ConnectX |
| **Switch Model:** Mellanox MT47396 InfiniScale III |
| **Number of Switches:** 8 |
| **Number of Ports:** 24 |
| **Data Rate:** InfiniBand 4x DDR |
| **Firmware:** 2020001 |

**Software**

| **Vendor:** -- |
| **Model:** -- |
| **Switch Model:** -- |
| **Number of Switches:** -- |
| **Number of Ports:** -- |
| **Data Rate:** -- |
| **Firmware:** -- |

Continued on next page
### SPEC MPI2007 Result

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#### Interconnect Description: InfiniBand (MPI)

- **Topology:** Bristle hypercube with express links  
- **Primary Use:** MPI traffic

#### Interconnect Description: InfiniBand (I/O)

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#### Submit Notes

The config file option 'submit' was used.

#### General Notes

Software environment:

- `setenv MPI_REQUEST_MAX 65536`  
  Determines the maximum number of nonblocking sends and receives that can simultaneously exist for any single MPI process. MPI generates an error message if this limit (or the default, if not set) is exceeded. Default: 16384
- `setenv MPI_TYPE_MAX 32768`  
  Determines the maximum number of data types that can simultaneously exist for any single MPI process. MPI generates an error message if this limit (or the default, if not set) is exceeded. Default: 1024
- `setenv MPI_BUFS_THRESHOLD 1`  
  Determines whether MPT uses per-host or per-process message buffers for communicating with other hosts. Per-host buffers are generally faster but for jobs running across many hosts they can consume a prodigious amount of memory. MPT will use per-host buffers for jobs using up to and including this many hosts and will use per-process buffers for larger host counts. Default: 64
- `setenv MPI_DSM_DISTRIBUTE`  
  Activates NUMA job placement mode. This mode ensures that each MPI process gets a unique CPU and physical memory on the node with which that CPU is associated. Currently, the CPUs are chosen by simply starting at relative CPU 0 and incrementing

Continued on next page
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Test sponsor: SGI
Tested by: SGI

General Notes (Continued)

until all MPI processes have been forked.

limit stacksize unlimited
   Removes limits on the maximum size of the automatically-
   extended stack region of the current process and each
   process it creates.

PBS Pro batch scheduler (www.altair.com) is used with
placement sets to ensure each MPI job is assigned to
a topologically compact set of nodes

BIOS settings:
   AMI BIOS version 8.15
   Hyper-Threading Technology enabled (default)
   Intel Turbo Boost Technology enabled (default)
   Intel Turbo Boost Technology activated in the OS via
   /etc/init.d/acpid start
   /etc/init.d/powersaved start
   powersave -f

Base Compiler Invocation

C benchmarks:
   icc

C++ benchmarks:
   126.lammps: icpc

Fortran benchmarks:
   ifort

Benchmarks using both Fortran and C:
   icc ifort

Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG
127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX

Base Optimization Flags

C benchmarks:
   -O3 -ipo -xT -no-prec-div

C++ benchmarks:

Continued on next page
Base Optimization Flags (Continued)

126.lammps: -O3 -ipo -xT -no-prec-div -ansi-alias

Fortran benchmarks:
-03 -ipo -xT -no-prec-div

Benchmarks using both Fortran and C:
-03 -ipo -xT -no-prec-div

Base Other Flags

C benchmarks:
-lmpi

C++ benchmarks:
126.lammps: -lmpi

Fortran benchmarks:
-lmpi

Benchmarks using both Fortran and C:
-lmpi

The flags file that was used to format this result can be browsed at
http://www.spec.org/mpi2007/flags/EM64T_Intel101_flags.20080611.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/EM64T_Intel101_flags.20080611.xml