## SPECmpI2007 Results

### SGI

**SGI Altix ICE 8400EX**  
(Ind Xeon X5690, 3.46 GHz)

**SPECmpI2007 Peak** = Not Run

**SPECmpI2007 Base** = 33.3

**MPI2007 license:** 4  
**Test date:** Jun-2011

**Test sponsor:** SGI  
**Hardware Availability:** Feb-2011

**Tested by:** SGI  
**Software Availability:** Aug-2011

### 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>
</tr>
</thead>
<tbody>
<tr>
<td>104.milc</td>
<td>192</td>
<td>55.5</td>
<td>28.2</td>
<td>52.6</td>
<td>29.8</td>
<td>52.6</td>
<td>29.8</td>
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<tr>
<td>107.leslie3d</td>
<td>192</td>
<td>164</td>
<td>31.8</td>
<td>164</td>
<td>31.8</td>
<td>165</td>
<td>31.7</td>
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<tr>
<td>113.GemsFDTD</td>
<td>192</td>
<td>238</td>
<td>26.5</td>
<td>238</td>
<td>26.6</td>
<td>238</td>
<td>26.5</td>
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<tr>
<td>115.fds4</td>
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<td>58.2</td>
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<td>57.9</td>
<td>33.7</td>
<td>57.9</td>
<td>33.7</td>
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<tr>
<td>121.pop2</td>
<td>192</td>
<td>167</td>
<td>24.7</td>
<td>166</td>
<td>24.8</td>
<td>167</td>
<td>24.7</td>
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<tr>
<td>122.tachyon</td>
<td>192</td>
<td>90.0</td>
<td>31.1</td>
<td>90.1</td>
<td>31.1</td>
<td>90.1</td>
<td>31.1</td>
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<tr>
<td>126.lammps</td>
<td>192</td>
<td>127</td>
<td>22.9</td>
<td>127</td>
<td>22.9</td>
<td>127</td>
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<tr>
<td>127.wrf2</td>
<td>192</td>
<td>146</td>
<td>53.5</td>
<td>146</td>
<td>53.5</td>
<td>146</td>
<td>53.5</td>
</tr>
<tr>
<td>128.GAPgeofem</td>
<td>192</td>
<td>56.4</td>
<td>36.6</td>
<td>55.6</td>
<td>37.1</td>
<td>56.2</td>
<td>36.7</td>
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<tr>
<td>129.tera_tf</td>
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<td>93.4</td>
<td>29.6</td>
<td>93.4</td>
<td>29.6</td>
<td>93.8</td>
<td>29.5</td>
</tr>
</tbody>
</table>

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
### SPEC mpiM2007 Result

**SGI Altix ICE 8400EX**
*Intel Xeon X5690, 3.46 GHz*

**SPEC mpiM_peak2007 = Not Run**

**SPEC mpiM_base2007 = 33.3**

<table>
<thead>
<tr>
<th>MPI2007 license:</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>SGI</td>
</tr>
<tr>
<td>Tested by:</td>
<td>SGI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Results Table (Continued)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benchmark</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>130.scorro</td>
</tr>
<tr>
<td>132.zeusmp2</td>
</tr>
<tr>
<td>137.lu</td>
</tr>
</tbody>
</table>

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 8400EX Compute Node
- **Interconnect:** InfiniBand (MPI and I/O)
- **File Server Node:** SGI InfiniteStorage Nexis 2000 NAS
- **Total Compute Nodes:** 16
- **Total Chips:** 32
- **Total Cores:** 192
- **Total Memory:** 384 GB
- **Base Ranks Run:** 192
- **Minimum Peak Ranks:** --
- **Maximum Peak Ranks:** --

### Node Description: SGI Altix ICE 8400EX Compute Node

#### Hardware

- **Number of nodes:** 16
- **Uses of the node:** compute
- **Vendor:** SGI
- **Model:** SGI Altix ICE 8400EX (Intel Xeon X5690, 3.46 GHz)
- **CPU Name:** Intel Xeon X5690
- **CPU(s) orderable:** 1-2 chips
- **Chips enabled:** 2
- **Cores enabled:** 12
- **Cores per chip:** 6
- **Threads per core:** 2
- **CPU Characteristics:**
  - Six Core, 3.46 GHz, 6.4 GT/s QPI
  - Intel Turbo Boost Technology up to 3.73 GHz
  - Hyper-Threading Technology enabled
  - 3467 MHz
- **Primary Cache:** 32 KB L1 + 32 KB D on chip per core
- **Secondary Cache:** 256 KB I+D on chip per core
- **L3 Cache:** 12 MB I+D on chip per chip
- **Memory:** 24 GB (6 x 4 GB 2Rx4 PC3-10600R-9, ECC)
- **Disk Subsystem:** None
- **Other Hardware:** None
- **Adapter:** Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)
- **Number of Adapters:** 2
- **Slot Type:** PCIe x8 Gen2

#### Software

- **C Compiler:** Intel C++ Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309
- **C++ Compiler:** Intel C++ Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309
- **Fortran Compiler:** Intel Fortran Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **MPI Library:** SGI MPT 2.04 Patch 10789
- **Other MPI Info:** OFED 1.4.2
- **Pre-processors:** None
- **Other Software:** None

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**SPEC MPIM2007 Result**

**SGI**

SGI Altix ICE 8400EX
(Intel Xeon X5690, 3.46 GHz)

**SPECmpiM_peak2007 =** Not Run

**SPECmpiM_base2007 =** 33.3

<table>
<thead>
<tr>
<th>MPI2007 license:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>SGI</td>
</tr>
<tr>
<td>Tested by:</td>
<td>SGI</td>
</tr>
</tbody>
</table>

**Node Description: SGI Altix ICE 8400EX Compute Node**

<table>
<thead>
<tr>
<th>Data Rate:</th>
<th>InfiniBand 4x QDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports Used:</td>
<td>1</td>
</tr>
<tr>
<td>Interconnect Type:</td>
<td>InfiniBand</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of nodes:</td>
<td>1</td>
</tr>
<tr>
<td>Uses of the node:</td>
<td>filesystem</td>
</tr>
<tr>
<td>Vendor:</td>
<td>SGI</td>
</tr>
<tr>
<td>Model:</td>
<td>SGI Altix XE 270 (Intel Xeon X5670, 2.93 GHz)</td>
</tr>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon X5670</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1-2 chips</td>
</tr>
<tr>
<td>Chips enabled:</td>
<td>2</td>
</tr>
<tr>
<td>Cores enabled:</td>
<td>12</td>
</tr>
<tr>
<td>Cores per chip:</td>
<td>6</td>
</tr>
<tr>
<td>Threads per core:</td>
<td>2</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.33 GHz Hyper-Threading Technology enabled</td>
</tr>
<tr>
<td>CPU MHZ:</td>
<td>2933</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per chip</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>12 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>96 GB (12*8 GB DDR3-1333 CL9 DIMMs)</td>
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<tr>
<td>Disk Subsystem:</td>
<td>8.8 TB RAID 5</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>60 x 146 GB SAS (Seagate Cheetah 15K.5)</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
<tr>
<td>Adapter:</td>
<td>Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)</td>
</tr>
<tr>
<td>Number of Adapters:</td>
<td>2</td>
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<tr>
<td>Slot Type:</td>
<td>PCIe x8 Gen2</td>
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<tr>
<td>Data Rate:</td>
<td>InfiniBand 4x QDR</td>
</tr>
<tr>
<td>Ports Used:</td>
<td>2</td>
</tr>
<tr>
<td>Interconnect Type:</td>
<td>InfiniBand</td>
</tr>
</tbody>
</table>

**Interconnect Description: InfiniBand (MPI and I/O)**

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor:</td>
<td>Mellanox Technologies and SGI</td>
</tr>
<tr>
<td>Model:</td>
<td>None</td>
</tr>
<tr>
<td>Switch Model:</td>
<td>SGI QDR_1.5_HYPR_2454 with Mellanox Device 48438 (Infiniscale IV)</td>
</tr>
<tr>
<td>Number of Switches:</td>
<td>4</td>
</tr>
<tr>
<td>Number of Ports:</td>
<td>36</td>
</tr>
<tr>
<td>Data Rate:</td>
<td>InfiniBand 4x QDR</td>
</tr>
</tbody>
</table>

Test date: Jun-2011
Hardware Availability: Feb-2011
Software Availability: Aug-2011

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Continued on next page
**SPEC mpiM_peak2007 = Not Run**

**SPEC mpiM_base2007 = 33.3**

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**SGI**

SGI Altix ICE 8400EX
(Intel Xeon X5690, 3.46 GHz)

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**Interconnect Description: InfiniBand (MPI and I/O)**

- **Firmware:** 5040005
- **Topology:** Enhanced Hypercube
- **Primary Use:** MPI and I/O traffic

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**Submit Notes**

The config file option 'submit' was used.

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**General Notes**

**Software environment:**
- export MPI_REQUEST_MAX=65536
- export MPI_TYPE_MAX=32768
- export MPI_BUFS_THRESHOLD=1
- export MPI_IB_RAILS=2
- ulimit -s unlimited

**BIOS settings:**
- AMI BIOS version 080016
- 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

**Job Placement:**
Each MPI job was assigned to a topologically compact set of nodes, i.e. the minimal needed number of switches was used for each job: 2 switches for up to 96 ranks, 4 switches for 192 ranks, 8 switches for 384 ranks, 16 switches for 768 ranks.

**Additional notes regarding interconnect:**
The Infiniband network consists of two independent planes, with half the switches in the system allocated to each plane. I/O traffic is restricted to one plane, while MPI traffic can use both planes.

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**Base Compiler Invocation**

**C benchmarks:**
- icc

**C++ benchmarks:**

Continued on next page
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SPECmpiM_base2007 = 33.3

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Tested by: SGI

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Hardware Availability: Feb-2011
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Base Compiler Invocation (Continued)

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 -xSSE4.2 -no-prec-div
C++ benchmarks:
126.lammps: -O3 -xSSE4.2 -no-prec-div -ansi-alias
Fortran benchmarks:
-O3 -xSSE4.2 -no-prec-div
Benchmarks using both Fortran and C:
-O3 -xSSE4.2 -no-prec-div

Base Other Flags

C benchmarks:
-1mpi
C++ benchmarks:
126.lammps: -1mpi
Fortran benchmarks:
-1mpi
Benchmarks using both Fortran and C:
-1mpi
### SGI

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The flags file that was used to format this result can be browsed at:

http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel12_flags.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel12_flags.xml

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For questions about this result, please contact the tester.  
For other inquiries, please contact webmaster@spec.org.

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