### SPEC® MPIM2007 Result

**SGI**

SGI Altix ICE 8400EX  
(Intel Xeon X5680, 3.33 GHz)

**SPECmpiM_peak2007 = Not Run**  
**SPECmpiM_base2007 = 18.0**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>104.milc</td>
<td>96</td>
<td></td>
<td>98.5</td>
<td>15.9</td>
<td></td>
<td>97.5</td>
<td>16.0</td>
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<tr>
<td>107.leslie3d</td>
<td>96</td>
<td></td>
<td>323</td>
<td>16.2</td>
<td></td>
<td>323</td>
<td>16.2</td>
</tr>
<tr>
<td>113.GemsFDTD</td>
<td>96</td>
<td></td>
<td>237</td>
<td>26.6</td>
<td></td>
<td>238</td>
<td>26.5</td>
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<td>115.fds4</td>
<td>96</td>
<td></td>
<td>141</td>
<td>13.8</td>
<td></td>
<td>142</td>
<td>13.8</td>
</tr>
<tr>
<td>121.pop2</td>
<td>96</td>
<td></td>
<td>260</td>
<td>15.9</td>
<td></td>
<td>262</td>
<td>15.8</td>
</tr>
<tr>
<td>122.tachyon</td>
<td>96</td>
<td></td>
<td>193</td>
<td>14.5</td>
<td></td>
<td>192</td>
<td>14.5</td>
</tr>
<tr>
<td>126.lammps</td>
<td>96</td>
<td></td>
<td>190</td>
<td>15.3</td>
<td></td>
<td>190</td>
<td>15.3</td>
</tr>
<tr>
<td>127.wrf2</td>
<td>96</td>
<td></td>
<td>281</td>
<td>27.7</td>
<td></td>
<td>281</td>
<td>27.7</td>
</tr>
<tr>
<td>128.GAPgeofem</td>
<td>96</td>
<td></td>
<td>113</td>
<td>18.3</td>
<td></td>
<td>112</td>
<td>18.4</td>
</tr>
<tr>
<td>129.tera_tf</td>
<td>96</td>
<td></td>
<td>187</td>
<td>14.8</td>
<td></td>
<td>187</td>
<td>14.8</td>
</tr>
</tbody>
</table>

**MPI2007 license:** 4  
**Test sponsor:** SGI  
**Tested by:** SGI  
**Test date:** Sep-2010  
**Hardware Availability:** May-2010  
**Software Availability:** Oct-2010

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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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**SPECmpiM_peak2007 = Not Run**

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**Results Table (Continued)**

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<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130.socorro</td>
<td>96</td>
<td>201</td>
<td>19.0</td>
<td>201</td>
<td>19.0</td>
<td>207</td>
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<tr>
<td>132.zeusmp2</td>
<td>96</td>
<td>155</td>
<td>20.0</td>
<td>156</td>
<td>19.9</td>
<td>154</td>
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<tr>
<td>137.lu</td>
<td>96</td>
<td>171</td>
<td>21.5</td>
<td>171</td>
<td>21.4</td>
<td>173</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

Interconnects: InfiniBand (MPI)

File Server Node: SGI InfiniteStorage Nexis 2000 NAS

Total Compute Nodes: 8

Total Chips: 16

Total Cores: 96

Total Threads: 192

Total Memory: 192 GB

Base Ranks Run: 96

Minimum Peak Ranks: --

Maximum Peak Ranks: --

**Software Summary**

C Compiler: Intel C Compiler for Linux

Version 11.1, Build 20100414

C++ Compiler: Intel C++ Compiler for Linux

Version 11.1, Build 20100414

Fortran Compiler: Intel Fortran Compiler for Linux

Version 11.1, Build 20100414

Base Pointers: 64-bit

Peak Pointers: 64-bit

MPI Library: SGI MPT 2.02 Beta

Other MPI Info: OFED 1.4.2

Pre-processors: None

Other Software: None

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

**Hardware**

Number of nodes: 8

Uses of the node: compute

Vendor: SGI

Model: SGI Altix ICE 8400EX (Intel Xeon X5680, 3.33 GHz)

CPU Name: Intel Xeon X5680

CPU(s) orderable: 1-2 chips

Chips enabled: 2

Cores enabled: 12

Cores per chip: 6

Threads per core: 2

CPU Characteristics: Six Core, 3.33 GHz, 6.4 GT/s QPI

Intel Turbo Boost Technology up to 3.6 GHz

Hyper-Threading Technology enabled

CPU MHz: 3333

Primary Cache: 32 KB I + 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

Other Cache: None

Memory: 24 GB (6*4GB DDR3-1333 CL9 RDIMMs)

Disk Subsystem: None

Other Hardware: None

Adapter: Mellanox MT26428 ConnectX IB QDR

(PCIe x8 Gen2 5 GT/s)

**Software**

Adapter: Mellanox MT26428 ConnectX IB QDR

(PCIe x8 Gen2 5 GT/s)

Adapter Driver: OFED-1.4.2

Adapter Firmware: 2.7.200

Operating System: SUSE Linux Enterprise Server 11 SP1, Kernel 2.6.32.13-0.4-default

Local File System: NFSv3

Shared File System: NFSv3 IPoIB

System State: Multi-user, run level 3

Other Software: SGI ProPack 7 for Linux Service Pack 1, SGI Tempo V 2.1

Continued on next page
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**SGI Altix ICE 8400EX**  
(Intel Xeon X5680, 3.33 GHz)

**SPECmpiM_peak2007 = Not Run**  
**SPECmpiM_base2007 = 18.0**

<table>
<thead>
<tr>
<th><strong>MPI2007 license:</strong></th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test sponsor:</strong></td>
<td>SGI</td>
</tr>
<tr>
<td><strong>Tested by:</strong></td>
<td>SGI</td>
</tr>
<tr>
<td><strong>Test date:</strong></td>
<td>Sep-2010</td>
</tr>
<tr>
<td><strong>Hardware Availability:</strong></td>
<td>May-2010</td>
</tr>
<tr>
<td><strong>Software Availability:</strong></td>
<td>Oct-2010</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th><strong>Slot Type:</strong></th>
<th>PCIe x8 Gen2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Rate:</strong></td>
<td>InfiniBand 4x QDR</td>
</tr>
<tr>
<td><strong>Ports Used:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Interconnect Type:</strong></td>
<td>InfiniBand</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th><strong>Number of nodes:</strong></th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uses of the node:</strong></td>
<td>fileserver</td>
</tr>
<tr>
<td><strong>Vendor:</strong></td>
<td>SGI</td>
</tr>
<tr>
<td><strong>Model:</strong></td>
<td>SGI Altix XE 270 (Intel Xeon X5670, 2.93 GHz)</td>
</tr>
<tr>
<td><strong>CPU Name:</strong></td>
<td>Intel Xeon X5670</td>
</tr>
<tr>
<td><strong>CPU(s) orderable:</strong></td>
<td>1-2 chips</td>
</tr>
<tr>
<td><strong>Chips enabled:</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Cores enabled:</strong></td>
<td>12</td>
</tr>
<tr>
<td><strong>Cores per chip:</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Threads per core:</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>CPU Characteristics:</strong></td>
<td>Intel Turbo Boost Technology up to 3.33 GHz Hyper-Threading Technology enabled</td>
</tr>
<tr>
<td><strong>CPU MHz:</strong></td>
<td>2933</td>
</tr>
<tr>
<td><strong>Primary Cache:</strong></td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>Secondary Cache:</strong></td>
<td>256 KB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>L3 Cache:</strong></td>
<td>12 MB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>Other Cache:</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Memory:</strong></td>
<td>24 GB (6*4GB DDR3-1333 CL9 DIMMs)</td>
</tr>
<tr>
<td><strong>Disk Subsystem:</strong></td>
<td>8.8 TB RAID 5</td>
</tr>
<tr>
<td><strong>Others:</strong></td>
<td>60 x 146 GB SAS (Seagate Cheetah 15K.5)</td>
</tr>
<tr>
<td><strong>Other Hardware:</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Number of Adapters:</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Slot Type:</strong></td>
<td>PCIe x8 Gen2, PCIe x8 Gen1</td>
</tr>
<tr>
<td><strong>Data Rate:</strong></td>
<td>InfiniBand 4x DDR</td>
</tr>
<tr>
<td><strong>Ports Used:</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Interconnect Type:</strong></td>
<td>InfiniBand</td>
</tr>
</tbody>
</table>

#### Interconnect Description: InfiniBand (MPI)

<table>
<thead>
<tr>
<th><strong>Vendor:</strong></th>
<th>Mellanox Technologies and SGI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model:</strong></td>
<td>MT26428 ConnectX</td>
</tr>
<tr>
<td><strong>Switch Model:</strong></td>
<td>SGI QDR_1.5_HYPR_2454 with Mellanox Device 48438 (Infiniscale IV)</td>
</tr>
<tr>
<td><strong>Number of Switches:</strong></td>
<td>32</td>
</tr>
<tr>
<td><strong>Number of Ports:</strong></td>
<td>36</td>
</tr>
</tbody>
</table>

#### Software

<table>
<thead>
<tr>
<th><strong>Adapter:</strong></th>
<th>Mellanox MT26418 ConnectX, MT25208 InfiniHost III Ex</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adapter Driver:</strong></td>
<td>OFED-1.4.0</td>
</tr>
<tr>
<td><strong>Adapter Firmware:</strong></td>
<td>2.6.0 and 5.2.0</td>
</tr>
<tr>
<td><strong>Operating System:</strong></td>
<td>SUSE Linux Enterprise Server 11 (x86_64)</td>
</tr>
<tr>
<td><strong>Kernel:</strong></td>
<td>2.6.27.19-5-default</td>
</tr>
<tr>
<td><strong>Local File System:</strong></td>
<td>xfs</td>
</tr>
<tr>
<td><strong>Shared File System:</strong></td>
<td>--</td>
</tr>
<tr>
<td><strong>System State:</strong></td>
<td>Multi-user, run level 3</td>
</tr>
<tr>
<td><strong>Other Software:</strong></td>
<td>SGI Foundation Software 2</td>
</tr>
</tbody>
</table>

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

#### Interconnect Description: InfiniBand (MPI)

<table>
<thead>
<tr>
<th>Data Rate</th>
<th>InfiniBand 4x QDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firmware</td>
<td>5030005</td>
</tr>
<tr>
<td>Topology</td>
<td>Enhanced Hypercube</td>
</tr>
<tr>
<td>Primary Use</td>
<td>MPI traffic</td>
</tr>
</tbody>
</table>

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

**Hardware**

<table>
<thead>
<tr>
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<td>I/O traffic</td>
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</tbody>
</table>

**Software**

<table>
<thead>
<tr>
<th>BIOS settings:</th>
<th>AMI BIOS version 080016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyper-Threading Technology enabled (default)</td>
<td></td>
</tr>
<tr>
<td>Intel Turbo Boost Technology enabled (default)</td>
<td></td>
</tr>
<tr>
<td>Intel Turbo Boost Technology activated in the OS via /etc/init.d/acpid start /etc/init.d/powersaved start powersave -f</td>
<td></td>
</tr>
</tbody>
</table>

| 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 96 ranks, 4 switches for 192 ranks, 8 switches for 384 ranks, |

#### Submit Notes

The config file option 'submit' was used.

#### 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

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General Notes (Continued)
16 switches for 768 ranks, 32 switches for 1536 ranks.

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  -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:
    -lmpi

C++ benchmarks:
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Base Other Flags (Continued)

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/SGI_x86_64_Intel1111_flags.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel1111_flags.xml

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

Tested with SPEC MPI2007 v2.0.
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