SGI
SGI Altix ICE 8400EX
(AMD Opteron 6282 SE, 2.6GHz)

SPECmpiM_peak2007 = Not Run
SPECmpiM_base2007 = 21.5

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

---

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
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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.
SPEC MPIM2007 Result

SGI

SGI Altix ICE 8400EX
(AMD Opteron 6282 SE, 2.6GHz)

SPECmpiM_peak2007 = Not Run
SPECmpiM_base2007 = 21.5

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

Results Table (Continued)

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</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 4000
Total Compute Nodes: 8
Total Chips: 16
Total Cores: 256
Total Threads: 256
Total Memory: 1 TB
Base Ranks Run: 256
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C Compiler for Linux,
Version 11.1.073 Build 20100806
C++ Compiler: Intel C++ Compiler for Linux,
Version 11.1.073 Build 20100806
Fortran Compiler: Intel Fortran Compiler for Linux,
Version 11.1.073 Build 20100806
Base Pointers: 64-bit
Peak Pointers: 64-bit
MPI Library: SGI MPT 2.05
Other MPI Info: OFED 1.5.2
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 (AMD Opteron 6282 SE, 2.6GHz)
CPU Name: AMD Opteron 6282 SE
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 32
Cores per chip: 16
Threads per core: 1
CPU Characteristics: 16 cores/chip, 2.6 GHz
AMD Turbo CORE technology up to 3.30 GHz
CPU MHz: 2600
Primary Cache: 512 KB I on chip per chip,
64 KB I shared / 2 cores;
16 KB D on chip per core
Secondary Cache: 16 MB I+D on chip per chip, 2 MB I+D on chip per core
L3 Cache: 16 MB I+D on chip per chip, 8 MB shared / 8 cores
Other Cache: None
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)
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-1.5.2
Adapter Firmware: 2.7.0
Operating System: SUSE Linux Enterprise Server 11 SP1 (x86_64)
Kernel 2.6.32.46-0.3-default #1 SMP
Local File System: NFSv3
Shared File System: NFSv3 IPoIB
System State: Run level 3 (Multi-User)
Other Software: SGI Performance Suite 1.3,
Build 705r8.sles11-111092106
SGI Tempo Compute Node 2.5,
Build 705r10.sles11-111092111

Continued on next page
### SPEC MPI2007 Result

**SGI**

SGI Altix ICE 8400EX
(AMD Opteron 6282 SE, 2.6GHz)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>SPECmpiM_peak2007</td>
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</tr>
</tbody>
</table>

**MPI2007 license:** 4

**Test sponsor:** SGI

**Tested by:** SGI

**Test date:** Feb-2012

**Hardware Availability:** Nov-2011

**Software Availability:** Nov-2011

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

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
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<tbody>
<tr>
<td>Number of Adapters</td>
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<td>Slot Type</td>
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<tr>
<td>Data Rate</td>
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<tr>
<td>Ports Used</td>
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<tr>
<td>Interconnect Type</td>
<td>InfiniBand</td>
</tr>
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</table>

#### Node Description: SGI InfiniteStorage 4000

**Software**

Adapter: Mellanox MT25208 InfiniHost III Ex (PCIe x8 Gen1 2.5 GT/s)

Adapter Driver: OFED-1.4.2

Adapter Firmware: 5.3.0

Operating System: SUSE Linux Enterprise Server 11 SP1 (ia64) Kernel 2.6.32.12-0.7-default

Local File System: xfs

System State: Run Level 3 (Multi-User)

Other Software: SGI ProPack 7SP1 for Linux, Build 701r2.sles11-1005242307

**Hardware**

Vendor: SGI

Model: SGI Altix 450 (Intel Itanium 2, 1.6GHz)

CPU Name: Intel Itanium 2 9030

CPU(s) orderable: 2-38 chips

Chips enabled: 2

Cores enabled: 4

Cores per chip: 2

Threads per core: 1

CPU Characteristics: 1.6GHz/8MB, 533MHz FSB

CPU MHz: 1600

Primary Cache: 16 KB I + 16 KB D on chip per core

Secondary Cache: 1 MB I + 256 KB D on chip per core

L3 Cache: 4 MB I+D on chip per core

Other Cache: None

Memory: 24 GB (12 x 2 GB, 2Rx4 PC2-3200-3, ECC)

Disk Subsystem: 16 TB RAID 5

Other Hardware: None

Adapter: Mellanox MT25208 InfiniHost III Ex (PCIe x8 Gen1 2.5 GT/s)

Number of Adapters: 2

Slot Type: PCIe x8 Gen1

Data Rate: InfiniBand 4x DDR

Ports Used: 2

Interconnect Type: InfiniBand

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

**Hardware**

Vendor: Mellanox Technologies and SGI

Model: None

Switch Model: SGI QDR_1.5_HYPR_2454 with Mellanox Device 48438 (Infiniscale IV)

Number of Switches: 2

Number of Ports: 36

Continued on next page
SGI

SGI Altix ICE 8400EX
(AMD Opteron 6282 SE, 2.6GHz)

**SPEC mpiM**

<table>
<thead>
<tr>
<th><strong>SPEC mpiM peak2007</strong></th>
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**Interconnect Description: InfiniBand (MPI and I/O)**

<table>
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<tr>
<th>Data Rate:</th>
<th>InfiniBand 4x QDR</th>
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<tr>
<td>Firmware:</td>
<td>5040005</td>
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<tr>
<td>Topology:</td>
<td>Enhanced Hypercube</td>
</tr>
<tr>
<td>Primary Use:</td>
<td>MPI and I/O traffic</td>
</tr>
</tbody>
</table>

**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 2.0

- Job Placement:
  In the base run, each MPI job is assigned to a topologically compact set of nodes, i.e. the minimal needed number of switches was used for each job: 2 switch for up to 256 ranks, 4 switches for 512 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.
  SGI manufactures its own switch blades using unmodified Mellanox switch ASICs. The test system has SGI QDR_1.5_HYPR_2454 switch with Mellanox 36-port QDR Infiniband switch Device 40438 (InfiniScale IV).

**Base Compiler Invocation**

- C benchmarks:
  - icc

- C++ benchmarks:

**Continued on next page**
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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 -xSSE2 -ipo -no-prec-div
C++ benchmarks:
126.lammps: -O3 -xSSE2 -ipo -no-prec-div -ansi-alias
Fortran benchmarks:
-O3 -xSSE2 -ipo -no-prec-div
Benchmarks using both Fortran and C:
-O3 -xSSE2 -ipo -no-prec-div

Base Other Flags

C benchmarks:
-1mpi
C++ benchmarks:
126.lammps: -1mpi
Fortran benchmarks:
-1mpi
Benchmarks using both Fortran and C:
-1mpi
<table>
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**Test date:** Feb-2012  
**Hardware Availability:** Nov-2011  
**Software Availability:** Nov-2011

The flags file that was used to format this result can be browsed at [http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_flags.20120720.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_flags.20120720.html)

You can also download the XML flags source by saving the following link:  
[http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_flags.20120720.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_flags.20120720.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 v2.0.1.
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