### SPEC® MPIM2007 Result

**SGI**

SGI ICE X (Intel Xeon E5-2690 v2, 3.0 GHz)

**SPECmpiM_peake2007 = Not Run**

**SPECmpiM_base2007 = 12.0**

**MPI2007 license:** 4

**Test sponsor:** SGI

**Tested by:** SGI

**Test date:** Dec-2013

**Hardware Availability:** Sep-2013

**Software Availability:** Nov-2013

**104.milc**

**107.leslie3d**

**113.GemsFDTD**

**115.fds4**

**121.pop2**

**122.tachyon**

**126.lammps**

**127.wrf2**

**128.GAPgeofem**

**129.tera_tf**

**130.socorro**

**132.zeusmp2**

**137.lu**

---

**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>Seconds</th>
<th>Ratio</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
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<td>122.tachyon</td>
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<td>127.wrf2</td>
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<td>128.GAPgeofem</td>
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<td>13.0</td>
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<td>13.0</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 mpiM Peak2007** = Not Run

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>130.socorro</td>
<td>40</td>
<td>137</td>
<td>27.8</td>
<td>137</td>
<td>27.8</td>
<td>137</td>
<td>27.8</td>
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<tr>
<td>132.zeusmp2</td>
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<td>137.lu</td>
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<td>404</td>
<td>9.09</td>
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<td>9.11</td>
<td>397</td>
<td>9.25</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

<table>
<thead>
<tr>
<th>Compute Node:</th>
<th>SGI ICE X IP-113 Compute Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interconnect:</td>
<td>InfiniBand (MPI and I/O)</td>
</tr>
<tr>
<td>File Server Node:</td>
<td>SGI Modular InfiniteStorage Server</td>
</tr>
<tr>
<td>Total Compute Nodes:</td>
<td>2</td>
</tr>
<tr>
<td>Total Chips:</td>
<td>4</td>
</tr>
<tr>
<td>Total Cores:</td>
<td>40</td>
</tr>
<tr>
<td>Total Threads:</td>
<td>80</td>
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<tr>
<td>Total Memory:</td>
<td>128 GB</td>
</tr>
<tr>
<td>Base Ranks Run:</td>
<td>40</td>
</tr>
<tr>
<td>Minimum Peak Ranks:</td>
<td>--</td>
</tr>
<tr>
<td>Maximum Peak Ranks:</td>
<td>--</td>
</tr>
</tbody>
</table>

**Software Summary**

C Compiler: Intel C++ Composer XE 2011 for Linux, Version 14.0.0.080 Build 20130728

**Node Description: SGI ICE X IP-113 Compute Node**

**Hardware**

- **Number of nodes:** 2
- **Uses of the node:** compute
- **Vendor:** SGI
- **Model:** SGI ICE X IP-113 (Intel Xeon E5-2690 v2, 3.0 GHz)
- **CPU Name:** Intel Xeon E5-2690 v2
- **CPU(s) orderable:** 1-2 chips
- **Chips enabled:** 2
- **Cores enabled:** 20
- **Cores per chip:** 10
- **Threads per core:** 2
- **CPU Characteristics:** Ten Core, 3.0 GHz, 8.0 GT/s QPI
- **CPU MHz:** 3000
- **Primary Cache:** 32 KB L1 + 32 KB D on chip per core
- **Secondary Cache:** 256 KB I+D on chip per core
- **L3 Cache:** 25 MB I+D on chip per chip
- **Other Cache:** None
- **Memory:** 64 GB (8 x 8 GB 2Rx4 PC3-14900R-13, ECC)
- **Disk Subsystem:** None
- **Other Hardware:** None
- **Adapter:** Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8 GT/s)
- **Number of Adapters:** 2
- **Slot Type:** PCIe x8 Gen3

**Software**

- **Adapter:** Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8 GT/s)
- **Adapter Driver:** OFED-1.5.2
- **Adapter Firmware:** 2.11.312
- **Operating System:** SUSE Linux Enterprise Server 11 SP2, Kernel 3.0.80-0.7-default
- **Local File System:** NFSv3
- **Shared File System:** SUSE Linux Enterprise Server 11 SP2, NFSv3 IPoIB
- **System State:** Multi-user, run level 3
- **Other Software:** SGI Tempo Compute Node 2.7.3, Build 708rp14.sles11sp2-1305311204
## SPEC MPI2007 Result

**SGI**

SGI ICE X (Intel Xeon E5-2690 v2, 3.0 GHz)

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<tr>
<td>MPI2007 license: 4</td>
<td>Test date: Dec-2013</td>
</tr>
<tr>
<td>Test sponsor: SGI</td>
<td>Hardware Availability: Sep-2013</td>
</tr>
<tr>
<td>Tested by: SGI</td>
<td>Software Availability: Nov-2013</td>
</tr>
</tbody>
</table>

### Node Description: SGI ICE X IP-113 Compute Node

<table>
<thead>
<tr>
<th>Data Rate:</th>
<th>InfiniBand 4x FDR</th>
</tr>
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<tbody>
<tr>
<td>Ports Used:</td>
<td>2</td>
</tr>
<tr>
<td>Interconnect Type:</td>
<td>InfiniBand</td>
</tr>
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</table>

### Node Description: SGI Modular InfiniteStorage Server

**Hardware**

- Number of nodes: 1
- Uses of the node: fileserver
- Vendor: SGI
- Model: SGI Modular InfiniteStorage Server
- CPU Name: Intel Xeon E5-2670
- CPU(s) orderable: 1-2 chips
- Chips enabled: 2
- Cores enabled: 16
- Cores per chip: 8
- Threads per core: 2
- CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz
- CPU MHz: 2600
- Primary Cache: 32 KB I + 32 KB D on chip per core
- Secondary Cache: 256 KB I+D on chip per chip
- L3 Cache: 20 MB I+D on chip per chip
- Other Cache: None
- Memory: 128 GB (8 * 16 GB 2Rx4 PC3-12800R-11, ECC)
- Disk Subsystem: 64.8 TB RAID 6
- Other Hardware: None
- Adapter: Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8 GT/s)
- Number of Adapters: 2
- Slot Type: PCIe x8 Gen3
- Data Rate: InfiniBand 4x FDR
- Ports Used: 2
- Interconnect Type: InfiniBand

**Software**

- Adapter Driver: OFED-1.5.0
- Adapter Firmware: 2.11.312
- Operating System: SUSE Linux Enterprise Server 11 SP3
- Local File System: xfs
- System State: Multi-user, run level 3
- Other Software: SGI Foundation Software 2.9, Build 700r3.sles11-1004061553

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

**Hardware**

- Vendor: Mellanox Technologies and SGI
- Model: None
- Switch Model: SGI FDR Integrated IB Switch Blade 2SW9x27 with Mellanox SwitchX device 51000
- Number of Switches: 2
- Number of Ports: 36
- Data Rate: InfiniBand 4x FDR

**Software**

- Local File System: --
- Shared File System: --
- Other Software: --

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SPEC MPI2007 Result

SGI

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Interconnect Description: InfiniBand (MPI and I/O)

| Firmware: | 07130007_LLR and 08130007_LLR |
| Topology: | Enhanced Hypercube |
| Primary Use: | MPI and I/O traffic |

Submit Notes

The config file option 'submit' was used.

General Notes

130.socorro (base): "nullify_ptrs" src.alt was used.

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 3.0
- 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 180 ranks, 4 switches for up to 320 ranks, 8 switches for 640 ranks, 10 switches for 800 ranks, 16 switches for 1280 ranks, 22 switches for 1920 ranks, and 30 switches for 2560 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.

Base Compiler Invocation

C benchmarks:
- icc

Continued on next page
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Base Compiler Invocation (Continued)

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
130.socorro: -assume nostd_intent_in

Base Optimization Flags

C benchmarks:
-03 -xAVX -no-prec-div

C++ benchmarks:
126.lammps: -03 -xAVX -no-prec-div -ansi-alias

Fortran benchmarks:
-03 -xAVX -no-prec-div

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

Base Other Flags

C benchmarks:
-lmpi

C++ benchmarks:
126.lammps: -lmpi

Fortran benchmarks:
-lmpi

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### Base Other Flags (Continued)

Benchmarks using both Fortran and C:

```bash
-lmpi
```

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

[http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.html)

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

[http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.xml)