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

**SPECmpiM_base2007 = 22.8**

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

**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Seconds</td>
<td>Ratio</td>
</tr>
<tr>
<td>104.milc</td>
<td>80</td>
<td>93.7</td>
<td>16.7</td>
</tr>
<tr>
<td>107.leslie3d</td>
<td>80</td>
<td>259</td>
<td>20.2</td>
</tr>
<tr>
<td>113.GemsFDTD</td>
<td>80</td>
<td>207</td>
<td>30.4</td>
</tr>
<tr>
<td>115.fds4</td>
<td>80</td>
<td>111</td>
<td>17.6</td>
</tr>
<tr>
<td>121.pop2</td>
<td>80</td>
<td>216</td>
<td>19.1</td>
</tr>
<tr>
<td>122.tachyon</td>
<td>80</td>
<td>161</td>
<td>17.4</td>
</tr>
<tr>
<td>126.lammps</td>
<td>80</td>
<td>180</td>
<td>16.2</td>
</tr>
<tr>
<td>127.wrf2</td>
<td>80</td>
<td>213</td>
<td>36.6</td>
</tr>
<tr>
<td>128.GAPgeofem</td>
<td>80</td>
<td>83.5</td>
<td>24.7</td>
</tr>
<tr>
<td>129.tera_tf</td>
<td>80</td>
<td>156</td>
<td>17.8</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 MPI2007 Result

**SGI**

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

<table>
<thead>
<tr>
<th>SPECmpiM_peak2007</th>
<th>SPECmpiM_base2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>= Not Run</td>
<td>= 22.8</td>
</tr>
</tbody>
</table>

### MPI2007 license:
- 4

### Test sponsor:
- SGI

### Tested by:
- SGI

### Performance Results

<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></td>
<td>Base</td>
<td></td>
<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130.socorro</td>
<td>80</td>
<td>80.8</td>
<td>47.3</td>
<td>80.6</td>
<td>47.4</td>
<td>80.8</td>
<td>47.2</td>
</tr>
<tr>
<td>132.zeusmp2</td>
<td>80</td>
<td>137</td>
<td>22.7</td>
<td>136</td>
<td>22.8</td>
<td>137</td>
<td>22.7</td>
</tr>
<tr>
<td>137.lu</td>
<td>80</td>
<td>138</td>
<td>26.7</td>
<td>133</td>
<td>27.7</td>
<td>135</td>
<td>27.2</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 ICE X IP-113 Compute Node
- **Interconnect:** InfiniBand (MPI and I/O)
- **File Server Node:** SGI Modular InfiniteStorage Server
- **Total Compute Nodes:** 4
- **Total Chips:** 8
- **Total Cores:** 80
- **Total Threads:** 160
- **Total Memory:** 256 GB

### Software Summary

- **C Compiler:** Intel C++ Composer XE 2011 for Linux, Version 14.0.0.080 Build 20130728
- **C++ Compiler:** Intel C++ Composer XE 2011 for Linux, Version 14.0.0.080 Build 20130728
- **Fortran Compiler:** Intel Fortran Composer XE 2011 for Linux, Version 14.0.0.080 Build 20130728
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **MPI Library:** SGI MPT 2.09
- **Other MPI Info:** OFED 1.5.2
- **Pre-processors:** None
- **Other Software:** None

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

#### Hardware

- **Number of nodes:** 4
- **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, Intel Turbo Boost Technology up to 3.60 GHz, Hyper-Threading Technology enabled 3000
- **CPU MHz:** 32 KB 1 + 32 KB D on chip per core
- **Primary 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:** NFSv3 IPoIB
- **System State:** Multi-user, run level 3
- **Other Software:** SGI Tempo Compute Node 2.7.3, Build 708rp14.sles11sp2-1305311204

---

Continued on next page
SGI

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

<table>
<thead>
<tr>
<th>SPECmpiM_peak2007 = Not Run</th>
<th>SPECmpiM_base2007 = 22.8</th>
</tr>
</thead>
<tbody>
<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**

| Data Rate: | InfiniBand 4x FDR |
| Ports Used: | 2 |
| Interconnect Type: | InfiniBand |

**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
  - Hyper-Threading Technology enabled
- 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

**Software**

- Adapter Driver: OFED-1.5.0
- Adapter Firmware: 2.11.312
- Operating System: SUSE Linux Enterprise Server 11 SP3
- Kernel
- Local File System: xfs
- Shared File System: --
- 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

**Continued on next page**
**SGI**

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

**SPECmpim_peak2007** = **Not Run**

**SPECmpim_base2007** = **22.8**

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

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

**SPECmpiM_peak2007** = Not Run

**SPECmpiM_base2007** = 22.8

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

Test date: Dec-2013
Hardware Availability: Sep-2013
Software Availability: Nov-2013

---

**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:
-1mpi

C++ benchmarks:
126.lammps: -1mpi

Fortran benchmarks:
-1mpi

---

Continued on next page
**SGI ICE X (Intel Xeon E5-2690 v2, 3.0 GHz)**

<table>
<thead>
<tr>
<th>SPECmpiM_peak2007 = Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECmpiM_base2007 = 22.8</td>
</tr>
</tbody>
</table>

**Tested** by: SGI  
**Software Availability:** Nov-2013

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

**Base Other Flags (Continued)**

Benchmarks using both Fortran and C:

```bash
-mpi
```

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

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

---

SPEC and SPEC MPI are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC MPI2007 v2.0.1.
Originally published on 22 January 2014.