## SPEC® MPI2007 Result

**SGI**

**SGI ICE X**

(Intel Xeon E5-2690 v3, 2.6 GHz)

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**SPEC® mpiM results**

- **SPECmpiM_peak2007 = Not Run**
- **SPECmpiM_base2007 = 49.5**

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**MPI2007 license:**

14

**Test sponsor:**

SGI

**Tested by:**

SGI

**Test date:**

Jul-2014

**Hardware Availability:**

Sep-2014

**Software Availability:**

Apr-2014

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### 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>42.2</td>
<td>37.1</td>
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<td>107.leslie3d</td>
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<td>49.3</td>
<td>106</td>
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<td>49.3</td>
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<td>113.GemsFDTD</td>
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<td>115.fds4</td>
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<td>121.pop2</td>
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<td>111</td>
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<td>103</td>
<td>28.4</td>
<td>103</td>
<td>28.4</td>
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<td>75.2</td>
<td>36.8</td>
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</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 ICE X
(SGI ICE X (Intel Xeon E5-2690 v3, 2.6 GHz))

SPECmpim_peak2007 = Not Run
SPECmpim_base2007 = 49.5

MPI2007 license: 14
Test sponsor: SGI
Tested by: SGI

Results Table (Continued)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Ranks</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Ranks</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
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<tbody>
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<td>130.socorro</td>
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<td>45.7</td>
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<td>53.2</td>
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<tr>
<td>137.lu</td>
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<td>54.1</td>
<td>68.0</td>
<td>54.0</td>
<td>68.1</td>
<td>54.4</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-131 Compute Node
Interconnect: InfiniBand (MPI and I/O)
File Server Node: SGI Rackable C1103-TY12
Total Compute Nodes: 8
Total Chips: 16
Total Cores: 192
Total Threads: 192
Total Memory: 1 TB
Base Ranks Run: 192
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C++ Composer XE 2013 for Linux,
Version 14.0.3.174 Build 20140422
C++ Compiler: Intel C++ Composer XE 2013 for Linux
Version 14.0.3.174 Build 20140422
Fortran Compiler: Intel Fortran Composer XE 2013 for Linux,
Version 14.0.3.174 Build 20140422
Base Pointers: 64-bit
Peak Pointers: Not Applicable
MPI Library: SGI MPT 2.09 Patch 11049
Other MPI Info: OFED 1.5.4
Pre-processors: None
Other Software: None

Node Description: SGI ICE X IP-131 Compute Node

Hardware

Number of nodes: 8
Uses of the node: compute
Vendor: SGI
Model: SGI ICE X (Intel Xeon E6-2690 v3, 2.6 GHz)
CPU Name: Intel Xeon E5-2690 v3
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 24
Cores per chip: 12
Threads per core: 1
CPU Characteristics: 12 Core, 2.60 GHz, 9.6 GT/s QPI
Intel Turbo Boost Technology up to 3.50 GHz
Hyper-Threading Technology disabled
CPU MHz: 2600
Primary Cache: 32 KB L1 + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (8 x 16 GB 2Rx4 PC4-17000R-15, ECC)
Disk Subsystem: None
Other Hardware: None
Adapter: Mellanox MT27500 with ConnectX-3 ASIC
(PCIe x8 Gen3 8 GT/s)
Adapter Driver: OFED-1.5.4
Adapter Firmware: 2.30.3000
Operating System: SUSE Linux Enterprise Server 11 SP3 (x86_64),
Kernel 3.0.93-0.8-default
Local File System: NFSv3
Shared File System: NFSv3 IPoIB
System State: Multi-user, run level 3
Other Software: SGI Tempo Service Node 2.8.1,
Build 709rp49.sles11sp3-1402182002

Software

Adapter: Mellanox MT27500 with ConnectX-3 ASIC
(PCIe x8 Gen3 8 GT/s)
Adapter Driver: OFED-1.5.4
Adapter Firmware: 2.30.3000
Operating System: SUSE Linux Enterprise Server 11 SP3 (x86_64),
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Continued on next page
**SPEC MPIM2007 Result**

**SGI**

SGI ICE X  
(Intel Xeon E5-2690 v3, 2.6 GHz)

**SPECmpiM_peak2007 = Not Run**  
**SPECmpiM_base2007 = 49.5**

<table>
<thead>
<tr>
<th>MPI2007 license:</th>
<th>14</th>
</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 ICE X IP-131 Compute Node**

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

**Node Description: SGI Rackable C1103-TY12**

**Hardware**

- **Number of nodes:** 1
- **Uses of the node:** fileserver
- **Vendor:** SGI
- **Model:** SGI Rackable C1103-TY12 (Intel Xeon X5670, 2.93 GHz)
- **CPU Name:** Intel Xeon X5670
- **CPU(s) orderable:** 1-2 chips
- **Chips enabled:** 2
- **Cores enabled:** 12
- **Cores per chip:** 6
- **Threads per core:** 2
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.33 GHz
- **CPU MHz:** 2933
- **Primary Cache:** 32 KB I + 32 KB D on chip per core
- **Secondary Cache:** 256 KB I+D on chip per chip
- **L3 Cache:** 12 MB I+D on chip per chip
- **Other Cache:** None
- **Memory:** 96 GB (12 * 8 GB 2Rx4 PC3-10600R-9, ECC)
- **Disk Subsystem:** 12 TB RAID 6 12 x 1 TB SATA (Seagate Constellation, 7200RPM)
- **Other Hardware:** None
- **Adapter:** Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8 GT/s)
- **Adapter Driver:** OFED-1.5.2
- **Adapter Firmware:** 2.30.3000
- **Operating System:** SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.46-0.3-default
- **Local File System:** xfs
- **System State:** Multi-user, run level 3
- **Other Software:** SGI Foundation Software 2.5, Build 705r10.sles11-1110192111

**Software**

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

**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**
SPEC MPIM2007 Result

SGI

SGI ICE X
(Intel Xeon E5-2690 v3, 2.6 GHz)

SPECmpiM_peak2007 = Not Run
SPECmpiM_base2007 = 49.5

MPI2007 license: 14
Test sponsor: SGI
Tested by: SGI

Interconnect Description: InfiniBand (MPI and I/O)

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<thead>
<tr>
<th>Firmware:</th>
<th>09.02.3000</th>
</tr>
</thead>
<tbody>
<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_IB_RAILS=2
- ulimit -s unlimited

BIOS settings:
- AMI BIOS version DY2E6044
- Hyper-Threading Technology disabled
- Intel Turbo Boost Technology enabled (default)
- Intel Turbo Boost Technology activated with
  modprobe acpi_cpufreq
  cpupower frequency-set -u 2601MHz -d 2601MHz -g performance

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 192 ranks,
4 switches for up to 384 ranks, 8 switches for 768 ranks,
and 16 switches for 1536 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

C++ benchmarks:
- 126.lammps: icpc

Continued on next page
### Base Compiler Invocation (Continued)

Fortran benchmarks:
```bash
ifort
```

Benchmarks using both Fortran and C:
```bash
icc ifort
```

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>121.pop2</td>
<td>-DSPEC_MPI_CASE_FLAG</td>
</tr>
<tr>
<td>127.wrf2</td>
<td>-DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX</td>
</tr>
<tr>
<td>130.socorro</td>
<td>-assume nostd_intent_in</td>
</tr>
</tbody>
</table>

### Base Optimization Flags

**C benchmarks:**
```bash
-O3 -xCORE-AVX2 -no-prec-div
```

**C++ benchmarks:**
```bash
-O3 -xCORE-AVX2 -no-prec-div -ansi-alias
```

**Fortran benchmarks:**
```bash
-O3 -xCORE-AVX2 -no-prec-div
```

Benchmarks using both Fortran and C:
```bash
-O3 -xCORE-AVX2 -no-prec-div
```

### Base Other Flags

**C benchmarks:**
```bash
-1mpi
```

**C++ benchmarks:**
```bash
-1mpi
```

**Fortran benchmarks:**
```bash
-1mpi
```

Benchmarks using both Fortran and C:
```bash
-1mpi
```
SGI

SGI ICE X
(Intel Xeon E5-2690 v3, 2.6 GHz)

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MP2007 license: 14
Test sponsor: SGI
Tested by: SGI

Test date: Jul-2014
Hardware Availability: Sep-2014
Software Availability: Apr-2014

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.20140908.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.20140908.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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