## SPEC® MPI2007 Result

### SGI

SGI Rackable C2112-4RP4
(Intel Xeon E5-2697 v2, 2.70 GHz)

**SPECmpiM_peak2007** = 87.4  
**SPECmpiM_base2007** = 84.1

**MPI2007 license:** 4  
**Test date:** Aug-2013  
**Test sponsor:** SGI  
**Hardware Availability:** Sep-2013  
**Tested by:** SGI  
**Software Availability:** Jun-2013

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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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</table>

**SPECmpiM_base2007** = 84.1  
**SPECmpiM_peak2007** = 87.4

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
RESULTS TABLE (CONTINUED)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>30.4</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 Rackable C2112-4RP4 Compute Node
Interconnect: InfiniBand (MPI and I/O)
File Server Node: SGI MIS Server
Total Compute Nodes: 32
Total Chips: 64
Total Cores: 768
Total Threads: 1536
Total Memory: 4 TB
Base Ranks Run: 768
Minimum Peak Ranks: 96
Maximum Peak Ranks: 768

SOFTWARE SUMMARY

C Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.0.051 Build 20130529
C++ Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.0.051 Build 20130529
Fortran Compiler: Intel Fortran Composer XE 2013 for Linux, Version 14.0.0.051 Build 20130529
Base Pointers: 64-bit
Peak Pointers: 64-bit
MPI Library: SGI MPT 2.08 Patch 11012
Other MPI Info: OFED 1.5.2
Pre-processors: None
Other Software: None

NODE DESCRIPTION: SGI Rackable C2112-4RP4 Compute Node

Hardware

Number of nodes: 32
Uses of the node: compute
Vendor: SGI
Model: SGI Rackable C2112-4RP4 (Intel Xeon E5-2697 v2, 2.70GHz)
CPU Name: Intel Xeon E5-2697 v2
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 24
Cores per chip: 12
Threads per core: 2
CPU Characteristics: Twelve Core, 2.7 GHz, 8.0 GT/s QPI
CPU MHz: 2700
Primary Cache: 32 KB I + 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, 30 MB shared / 12 cores
Other Cache: None
Memory: 128 GB (8 x 16 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem: None
Other Hardware: None
Adapter: Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8.0 GT/s)

Software

Adapter: Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8.0 GT/s)
Adapter Driver: OFED-1.5.2
Adapter Firmware: 2.10.2370
Operating System: SUSE Linux Enterprise Server 11 SP2, Kernel 3.0.74-0.6.6-default
Local File System: xfs
Shared File System: NFSv3 IPoIB
System State: Multi-user, run level 3
Other Software: SGI Accelerate 1.6, Build 708r14.sles11sp2-1304102205

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# SPEC MPI2007 Result

**SGI**

SGI Rackable C2112-4RP4  
(Intel Xeon E5-2697 v2, 2.70 GHz)

**SPECmpiM_peak2007 = 87.4**  
**SPECmpiM_base2007 = 84.1**

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

## Node Description: SGI Rackable C2112-4RP4 Compute Node

| Number of Adapters: | 2 |
| Slot Type:          | PCIe x8 Gen3 |
| Data Rate:          | InfiniBand 4x FDR |
| Ports Used:         | 1 |
| Interconnect Type:  | InfiniBand |

## Node Description: SGI MIS Server

### Hardware

- Number of nodes: 1
- Uses of the node: fileserver
- Vendor: SGI
- Model: SGI MIS Server (Intel Xeon X2670, 2.60 GHz)
- 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 12800R-11, ECC)
- Disk Subsystem: 57.6TB RAID6  
64 x 900 GB SAS (Western Digital WD9001BKHG 10K)
- 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: Mellanox MT27500 with ConnectX-3 ASIC  
(Pcie x8 Gen3 8 GT/s)
- Adapter Driver: OFED-1.5.2
- Adapter Firmware: 2.11.500
- Operating System: SUSE Linux Enterprise Server 11 SP2 (x86_64)  
Kernel 3.0.74-6.6.5-default
- Local File System: xfs
- Shared File System: --
- System State: Multi-user, run level 3
- Other Software: SGI Foundation Software 2.8,  
Build 708r14.sles11sp2-1304102205

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

### Hardware

- Vendor: Mellanox Technologies
- Model: None
- Switch Model: Mellanox SX6025 InfiniBand Switch
- Number of Switches: 4
- Number of Ports: 36

### Software
SGI

SGI Rackable C2112-4RP4
(Intel Xeon E5-2697 v2, 2.70 GHz)

SPECmpiM_peak2007 = 87.4
SPECmpiM_base2007 = 84.1

Interconnect Description: InfiniBand (MPI and I/O)

| Data Rate: | InfiniBand 4x FDR |
| Firmwre:   | 9.1.7000         |
| Switch Model: | Mellanox SX6036 InfiniBand Switch |
| Number of Switches: | 2 |
| Number of Ports: | 36 |
| Data Rate: | InfiniBand 4x FDR |
| Firmwre:   | 9.1.6500         |
| Topology:  | Fat Tree        |
| 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
ulimit -s unlimited

Transparent Hugepage : disabled
  Transparent Hugepage is disabled by
  echo never > /sys/kernel/mm/transparent_hugepage/enabled

BIOS settings:
Intel BIOS version SE5C600.86B.99.99.x067.060720130951
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

Peak run:
  In the peak run, some benchmarks used different number of ranks
  from base. It is the only difference between base and peak.

Compiler Invocation

C benchmarks:
 icc

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SGI Rackable C2112-4RP4  
(Intel Xeon E5-2697 v2, 2.70 GHz)

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Compiler Invocation (Continued)

C++ benchmarks:
126.lammps: icpc
Fortran benchmarks:
ifort
Benchmarks using both Fortran and C:
icc ifort

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

Peak Optimization Flags

C benchmarks:
104.milc: basepeak = yes
122.tachyon: basepeak = yes
C++ benchmarks:
126.lammps: basepeak = yes
SGI
SGI Rackable C2112-4RP4 (Intel Xeon E5-2697 v2, 2.70 GHz)

SPECmpiM_peak2007 = 87.4
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Peak Optimization Flags (Continued)

Fortran benchmarks:

107.leslie3d: basepeak = yes
113.GemsFDTD: -O3 -xAVX -no-prec-div
129.tera_if: basepeak = yes
137.lu: basepeak = yes

Benchmarks using both Fortran and C:

115.fds4: basepeak = yes
121.pop2: basepeak = yes
127.wrf2: basepeak = yes
128.GAPgeofem: basepeak = yes
130.socorro: basepeak = yes
132.zeusmp2: basepeak = yes

Other Flags

C benchmarks:
-1mpi

C++ benchmarks:

126.lammps: -1mpi

Fortran benchmarks:
-1mpi

Benchmarks using both Fortran and C:
-1mpi

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
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<thead>
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<td>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.</td>
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<tr>
<td>For questions about this result, please contact the tester.</td>
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<td>For other inquiries, please contact <a href="mailto:webmaster@spec.org">webmaster@spec.org</a>.</td>
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