# SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

## SGI

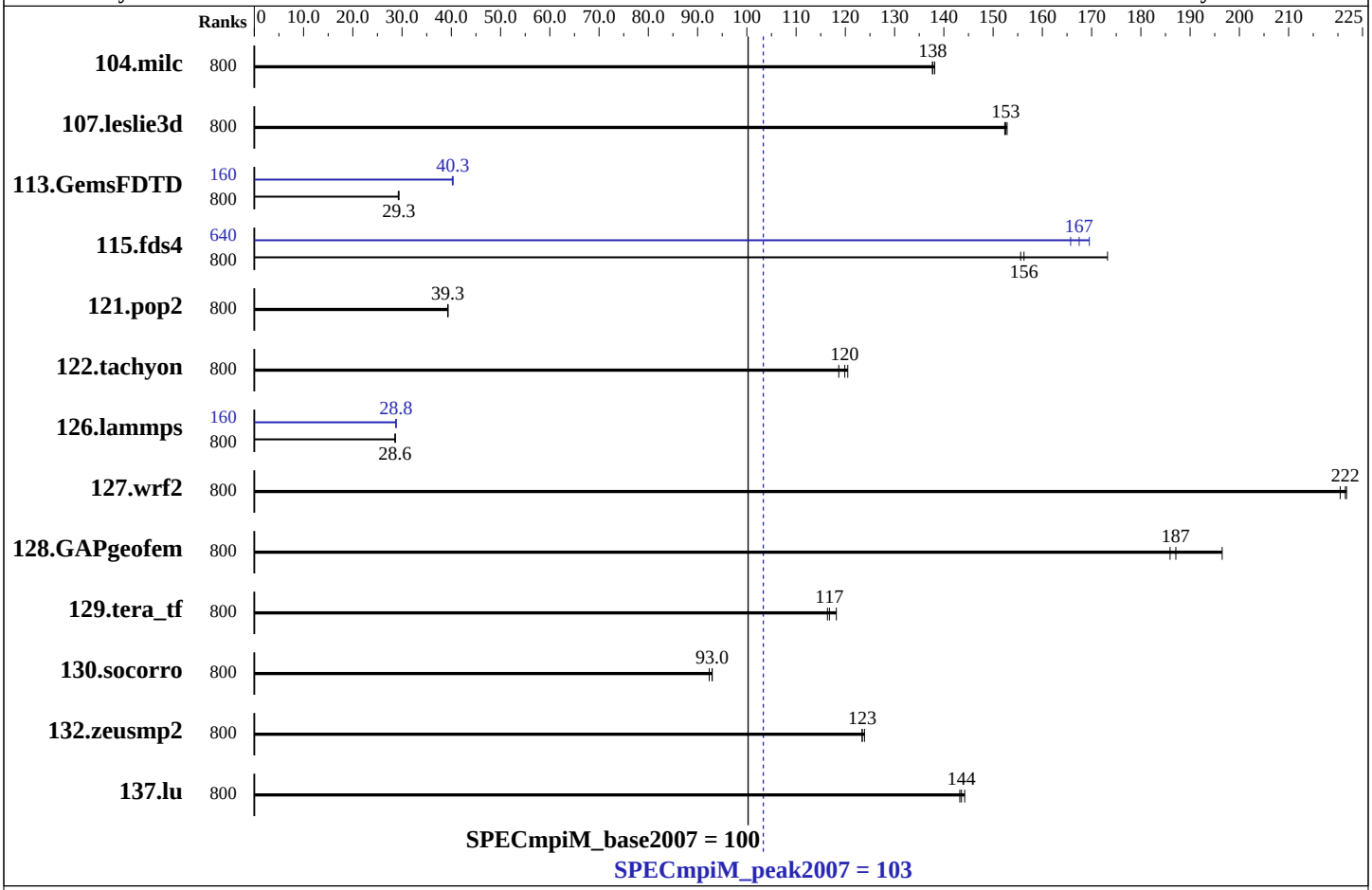
## SGI ICE X (Intel Xeon E5-2690 v2, 3.0 GHz)

SPECmpiM_peak2007 = 103

SPECmpiM_base2007 = 100

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

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




## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 104.milc | 800 | **11.4** | **138** | 11.4 | 138 | 11.3 | 138 | 800 | **11.4** | **138** | 11.4 | 138 | 11.3 | 138 |
| 107.leslie3d | 800 | **34.2** | **153** | 34.2 | 153 | 34.3 | 152 | 800 | **34.2** | **153** | 34.2 | 153 | 34.3 | 152 |
| 113.GemsFDTD | 800 | 215 | 29.4 | 216 | 29.2 | **215** | **29.3** | 160 | 156 | 40.3 | **156** | **40.3** | 157 | 40.2 |
| 115.fds4 | 800 | 12.5 | 156 | 11.3 | 173 | **12.5** | **156** | 640 | **11.6** | **167** | 11.5 | 170 | 11.8 | 166 |
| 121.pop2 | 800 | 105 | 39.3 | 105 | 39.4 | **105** | **39.3** | 800 | 105 | 39.3 | 105 | 39.4 | **105** | **39.3** |
| 122.tachyon | 800 | 23.2 | 120 | 23.6 | 119 | **23.3** | **120** | 800 | 23.2 | 120 | 23.6 | 119 | **23.3** | **120** |
| 126.lammps | 800 | 102 | 28.6 | **102** | **28.6** | 102 | 28.6 | 160 | 102 | 28.7 | 101 | 28.8 | **101** | **28.8** |
| 127.wrf2 | 800 | **35.2** | **222** | 35.4 | 220 | 35.2 | 222 | 800 | **35.2** | **222** | 35.4 | 220 | 35.2 | 222 |
| 128.GAPgeofem | 800 | 10.5 | 197 | **11.0** | **187** | 11.1 | 186 | 800 | 10.5 | 197 | **11.0** | **187** | 11.1 | 186 |
| 129.tera_tf | 800 | 23.8 | 116 | 23.4 | 118 | **23.7** | **117** | 800 | 23.8 | 116 | 23.4 | 118 | **23.7** | **117** |

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

Copyright 2006-2010 Standard Performance Evaluation Corporation

## SGI

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

SPECmpiM_peak2007 = 103

SPECmpiM_base2007 = 100

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

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

## Results Table (Continued)

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 130.socorro | 800 | **41.1** | **93.0** | 41.1 | 93.0 | 41.3 | 92.4 | 800 | **41.1** | **93.0** | 41.1 | 93.0 | 41.3 | 92.4 |
| 132.zeusmp2 | 800 | **25.1** | **123** | 25.0 | 124 | 25.1 | 123 | 800 | **25.1** | **123** | 25.0 | 124 | 25.1 | 123 |
| 137.lu | 800 | **25.6** | **144** | 25.5 | 144 | 25.7 | 143 | 800 | **25.6** | **144** | 25.5 | 144 | 25.7 | 143 |

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: | 40 |
| Total Chips: | 80 |
| Total Cores: | 800 |
| Total Threads: | 1600 |
| Total Memory: | 2560 GB |
| Base Ranks Run: | 800 |
| Minimum Peak Ranks: | 160 |
| Maximum Peak Ranks: | 800 |

### 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: | 40 |
| 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<br>Intel Turbo Boost Technology up to 3.60 GHz<br>Hyper-Threading Technology enabled |
| CPU MHz: | 3000 |
| Primary Cache: | 32 KB I + 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 |

Continued on next page

### 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 |

Copyright 2006-2010 Standard Performance Evaluation Corporation

## SGI

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

SPECmpiM_peak2007 = 103

SPECmpiM_base2007 = 100

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

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

## 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<br>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<br>72 x 900 GB SAS (Western Digital, 10K RPM) |
| Other Hardware: | None |
| Adapter: | Mellanox MT27500 with ConnectX-3 ASIC<br>(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<br>(PCIe x8 Gen3 8 GT/s) |
| Adapter Driver: | OFED-1.5.0 |
| Adapter Firmware: | 2.11.312 |
| Operating System: | SUSE Linux Enterprise Server 11 SP3<br>Kernel |
| Local File System: | xfs |
| Shared File System: | -- |
| System State: | Multi-user, run level 3 |
| Other Software: | SGI Foundation Software 2.9,<br>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<br>Mellanox SwitchX device 51000 |
| Number of Switches: | 12 |
| Number of Ports: | 36 |
| Data Rate: | InfiniBand 4x FDR |

### Software

Continued on next page

## 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
   export MPI_CONNECTIONS_THRESHOLD=0
   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.

 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`

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:
`-O3 -xAVX -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -xAVX -no-prec-div -ansi-alias`

Fortran benchmarks:
`-O3 -xAVX -no-prec-div`

Benchmarks using both Fortran and C:
`-O3 -xAVX -no-prec-div`

## Peak Optimization Flags

C benchmarks:

104.milc: `basepeak = yes`

122.tachyon: `basepeak = yes`

C++ benchmarks:

Continued on next page

## Peak Optimization Flags (Continued)

126.lammps: `-O3 -xAVX -no-prec-div -ansi-alias`

Fortran benchmarks:

107.leslie3d: `basepeak = yes`

113.GemsFDTD: `-O3 -xAVX -no-prec-div`

129.tera_tf: `basepeak = yes`

137.lu: `basepeak = yes`

Benchmarks using both Fortran and C:

115.fds4: `-O3 -xAVX -no-prec-div`

121.pop2: `basepeak = yes`

127.wrf2: `basepeak = yes`

128.GAPgeofem: `basepeak = yes`

130.socorro: `basepeak = yes`

132.zeusmp2: `basepeak = yes`

## Other Flags

C benchmarks:
`-lmpi`

C++ benchmarks:

126.lammps: `-lmpi`

Fortran benchmarks:
`-lmpi`

Benchmarks using both Fortran and C:
`-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`

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`

Copyright 2006-2010 Standard Performance Evaluation Corporation

## SGI

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

SPECmpiM_peak2007 = 103

SPECmpiM_base2007 = 100

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

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

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.
Report generated on Tue Jul 22 13:48:20 2014 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 22 January 2014.