# SPEC® MPIM2007 Result

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## SGI

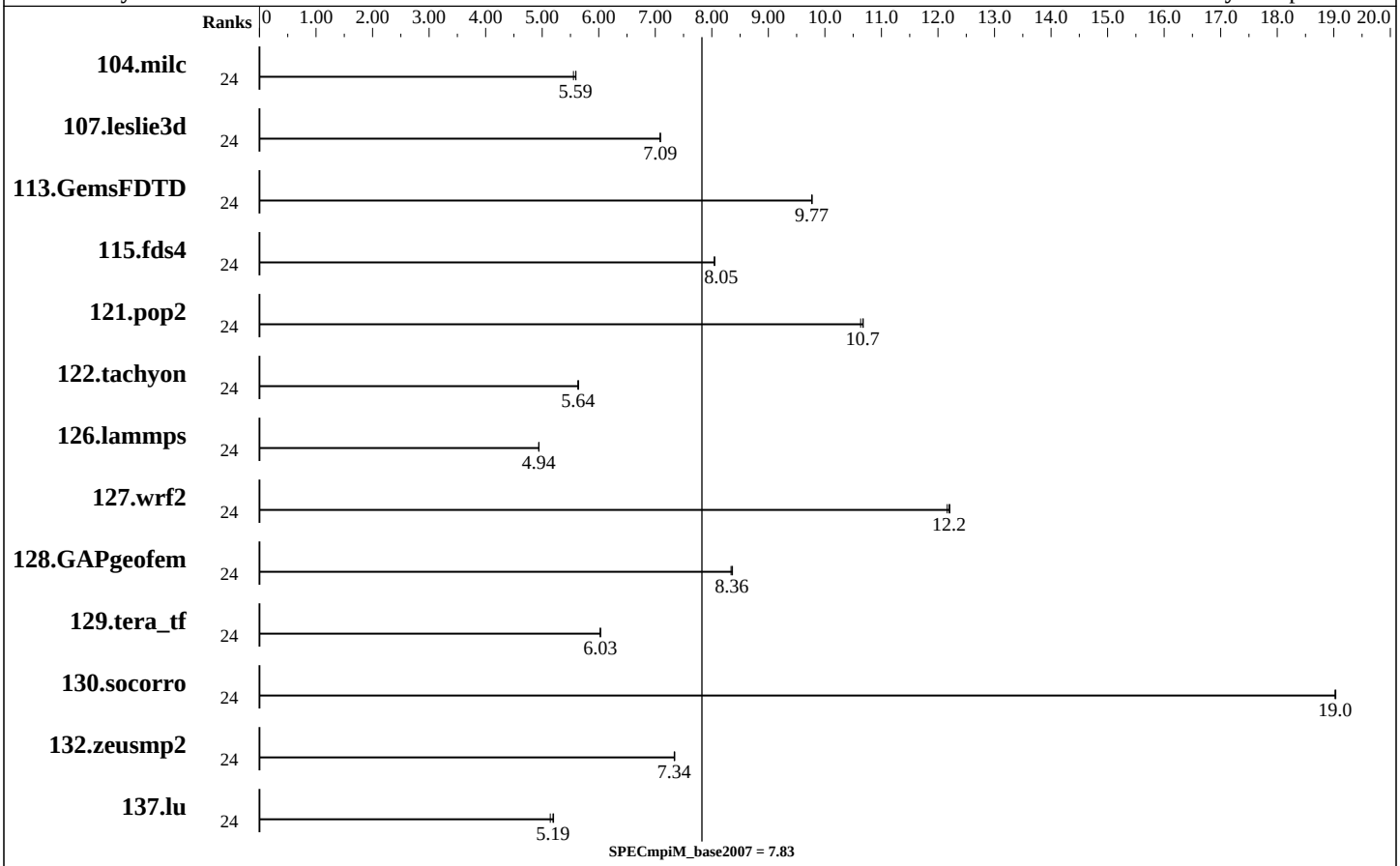
SGI ICE X
(Intel Xeon E5-2690 v3, 2.6 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 7.83

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

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




## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 104.milc | 24 | 282 | 5.55 | **280** | **5.59** | 280 | 5.60 | | | | | | | |
| 107.leslie3d | 24 | **737** | **7.09** | 736 | 7.09 | 737 | 7.09 | | | | | | | |
| 113.GemsFDTD | 24 | 646 | 9.77 | 645 | 9.77 | **646** | **9.77** | | | | | | | |
| 115.fds4 | 24 | 242 | 8.05 | **242** | **8.05** | 243 | 8.05 | | | | | | | |
| 121.pop2 | 24 | 388 | 10.6 | **387** | **10.7** | 387 | 10.7 | | | | | | | |
| 122.tachyon | 24 | 497 | 5.63 | 496 | 5.64 | **496** | **5.64** | | | | | | | |
| 126.lammps | 24 | **590** | **4.94** | 590 | 4.94 | 590 | 4.94 | | | | | | | |
| 127.wrf2 | 24 | 641 | 12.2 | 639 | 12.2 | **639** | **12.2** | | | | | | | |
| 128.GAPgeofem | 24 | **247** | **8.36** | 247 | 8.37 | 248 | 8.34 | | | | | | | |
| 129.tera_tf | 24 | 459 | 6.03 | **459** | **6.03** | 459 | 6.03 | | | | | | | |

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

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## Results Table (Continued)

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 130.socorro | 24 | 201 | 19.0 | 201 | 19.0 | **201** | **19.0** | | | | | | | |
| 132.zeusmp2 | 24 | 423 | 7.34 | **423** | **7.34** | 422 | 7.35 | | | | | | | |
| 137.lu | 24 | **708** | **5.19** | 707 | 5.20 | 715 | 5.14 | | | | | | | |

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: | 1 |
| Total Chips: | 2 |
| Total Cores: | 24 |
| Total Threads: | 24 |
| Total Memory: | 128 GB |
| Base Ranks Run: | 24 |
| 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: | 1 |
| Uses of the node: | compute |
| Vendor: | SGI |
| Model: | SGI ICE X (Intel Xeon E5-2690 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<br>Intel Turbo Boost Technology up to 3.50 GHz<br>Hyper-Threading Technology disabled |
| CPU MHz: | 2600 |
| 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 |
| 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) |
| Number of Adapters: | 2 |
| Slot Type: | PCIe x8 Gen3 |

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### 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), 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 |

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**Test sponsor:** SGI
**Tested by:** SGI

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

## 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<br>Hyper-Threading Technology enabled |
| 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<br>12 x 1 TB SATA (Seagate Constellation, 7200RPM) |
| 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: | 2.30.3000 |
| Operating System: | SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.46-0.3-default |
| Local File System: | xfs |
| Shared File System: | -- |
| System State: | Multi-user, run level 3 |
| Other Software: | SGI Foundation Software 2.5, Build 705r10.sles11-1110192111 |

## 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

Continued on next page

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

| | |
|---|---|
| Firmware: | 09.02.3000 |
| Topology: | Enhanced Hypercube |
| Primary Use: | MPI and I/O traffic |

## 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:
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:
-O3 -xCORE-AVX2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX2 -no-prec-div -ansi-alias

Fortran benchmarks:
-O3 -xCORE-AVX2 -no-prec-div

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

## Base 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.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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