



SPEC® MPIM2007 Result

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SGI

SGI Altix ICE 8200EX
(Intel Xeon X5570, 2.93 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 39.2

MPI2007 license: 4

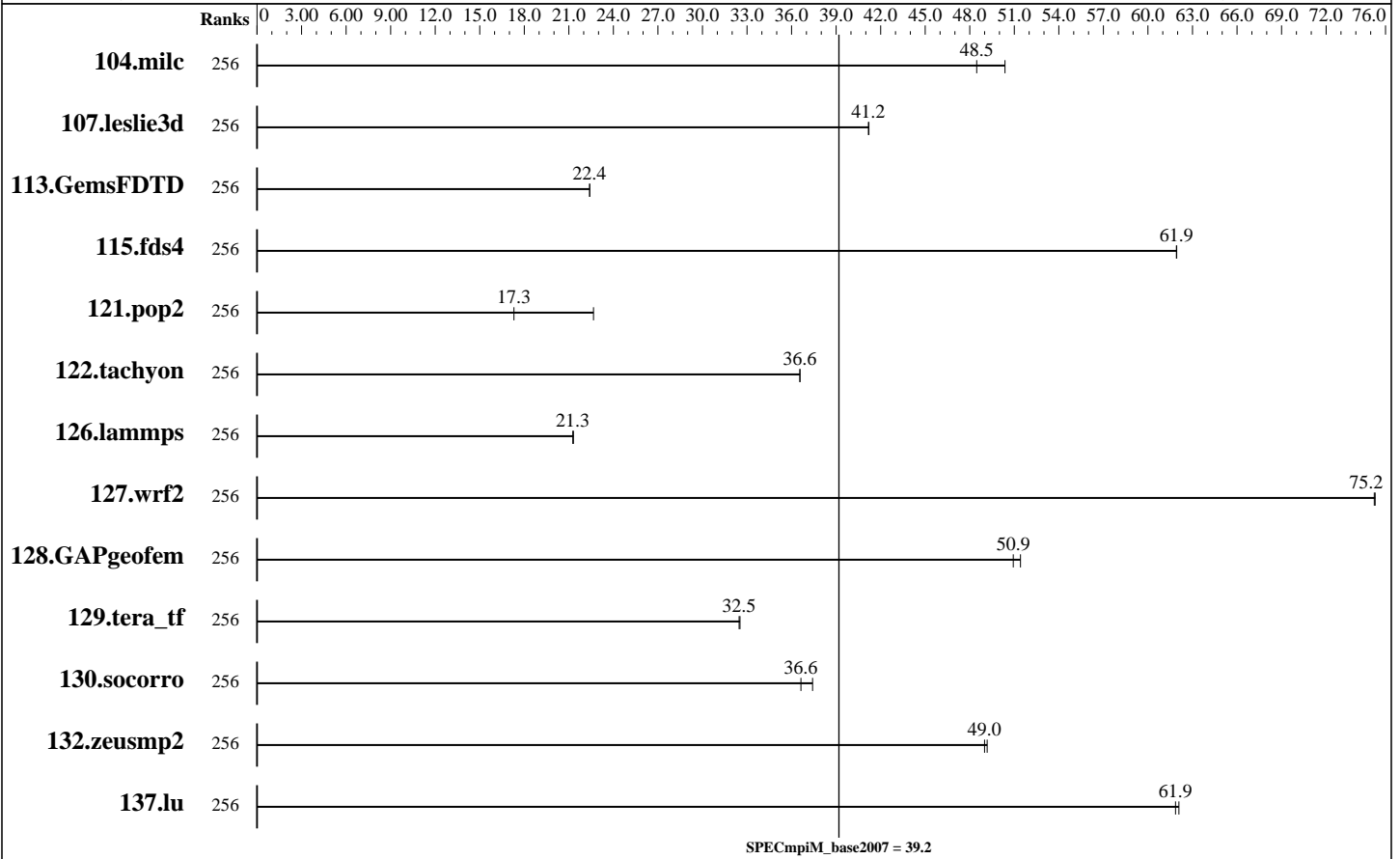
Test sponsor: SGI

Tested by: SGI

Test date: Feb-2009

Hardware Availability: Mar-2009

Software Availability: Jan-2009



Results Table

| Benchmark | Base | | | | | | | | Peak | | | | | | | |
|---------------|-------|-------------|-------------|-------------|-------------|---------|-------|-------|---------|-------|---------|-------|---------|-------|--|--|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | | |
| 104.milc | 256 | <u>32.3</u> | <u>48.5</u> | 31.1 | 50.4 | | | | | | | | | | | |
| 107.leslie3d | 256 | 127 | 41.2 | <u>127</u> | <u>41.2</u> | | | | | | | | | | | |
| 113.GemsFDTD | 256 | <u>282</u> | <u>22.4</u> | 282 | 22.4 | | | | | | | | | | | |
| 115.fds4 | 256 | 31.5 | 61.9 | <u>31.5</u> | <u>61.9</u> | | | | | | | | | | | |
| 121.pop2 | 256 | 182 | 22.7 | <u>239</u> | <u>17.3</u> | | | | | | | | | | | |
| 122.tachyon | 256 | <u>76.5</u> | <u>36.6</u> | 76.5 | 36.6 | | | | | | | | | | | |
| 126.lammps | 256 | <u>137</u> | <u>21.3</u> | 137 | 21.3 | | | | | | | | | | | |
| 127.wrf2 | 256 | 104 | 75.3 | <u>104</u> | <u>75.2</u> | | | | | | | | | | | |
| 128.GAPgeofem | 256 | 40.2 | 51.4 | <u>40.5</u> | <u>50.9</u> | | | | | | | | | | | |
| 129.tera_tf | 256 | 85.1 | 32.5 | <u>85.3</u> | <u>32.5</u> | | | | | | | | | | | |

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 | 256 | 102 | 37.4 | 104 | 36.6 | | | | | | | | | |
| 132.zeusmp2 | 256 | 63.3 | 49.0 | 63.1 | 49.2 | | | | | | | | | |
| 137.lu | 256 | 59.2 | 62.1 | 59.4 | 61.9 | | | | | | | | | |

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 Altix ICE 8200EX Compute Node
 Interconnects: InfiniBand (MPI)
 InfiniBand (I/O)
 File Server Node: SGI InfiniteStorage Nexis 2000 NAS
 Total Compute Nodes: 32
 Total Chips: 64
 Total Cores: 256
 Total Threads: 512
 Total Memory: 1536 GB
 Base Ranks Run: 256
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C Compiler for Linux
 Version 10.1, Build 20080801
 C++ Compiler: Intel C++ Compiler for Linux
 Version 10.1, Build 20080801
 Fortran Compiler: Intel Fortran Compiler for Linux
 Version 10.1, Build 20080801
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: SGI MPT 1.23
 Other MPI Info: OFED 1.3.1
 Pre-processors: None
 Other Software: None

Node Description: SGI Altix ICE 8200EX Compute Node

Hardware

Number of nodes: 32
 Uses of the node: compute
 Vendor: SGI
 Model: SGI Altix ICE 8200EX (Intel Xeon X5570, 2.93 GHz)
 CPU Name: Intel Xeon X5570
 CPU(s) orderable: 1-2 chips
 Chips enabled: 2
 Cores enabled: 8
 Cores per chip: 4
 Threads per core: 2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz,
 6.4 GT/s QPI, Hyper-Threading enabled
 CPU MHz: 2934
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 8 MB I+D on chip per chip
 Other Cache: None
 Memory: 48 GB (12*4GB DDR3-1066 CL7 RDIMMs)
 Disk Subsystem: None
 Other Hardware: None
 Adapter: Mellanox MT26418 ConnectX IB DDR
 (PCIe x8 Gen2 5 GT/s)
 Number of Adapters: 1

Software

Adapter: Mellanox MT26418 ConnectX IB DDR
 (PCIe x8 Gen2 5 GT/s)
 Adapter Driver: OFED-1.3.1
 Adapter Firmware: 2.5.0
 Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP2
 Kernel 2.6.16.60-0.30-smp
 Local File System: NFSv3
 Shared File System: NFSv3 IPoIB
 System State: Multi-user, run level 3
 Other Software: SGI ProPack 6 for Linux Service Pack 2

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Test date: Feb-2009

Hardware Availability: Mar-2009

Software Availability: Jan-2009

Node Description: SGI Altix ICE 8200EX Compute Node

Slot Type: PCIe x8 Gen2
Data Rate: InfiniBand 4x DDR
Ports Used: 2
Interconnect Type: InfiniBand

Node Description: SGI InfiniteStorage Nexis 2000 NAS

Hardware

Number of nodes: 1
Uses of the node: fileserver
Vendor: SGI
Model: SGI Altix XE 240 (Intel Xeon 5140, 2.33 GHz)
CPU Name: Intel Xeon 5140
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 4
Cores per chip: 2
Threads per core: 1
CPU Characteristics: 1333 MHz FSB
CPU MHz: 2328
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 4 MB I+D on chip per chip
L3 Cache: None
Other Cache: None
Memory: 24 GB (6*4GB DDR2-400 DIMMS)
Disk Subsystem: 7 TB RAID 5
48 x 147 GB SAS (Seagate Cheetah 15000 rpm)
Other Hardware: None
Adapter: Mellanox MT25208 InfiniHost III Ex
(PCIe x8 Gen1 2.5 GT/s)
Number of Adapters: 2
Slot Type: PCIe x8 Gen1
Data Rate: InfiniBand 4x DDR
Ports Used: 2
Interconnect Type: InfiniBand

Software

Adapter: Mellanox MT25208 InfiniHost III Ex
(PCIe x8 Gen1 2.5 GT/s)
Adapter Driver: OFED-1.3
Adapter Firmware: 5.3.0
Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP1
Kernel 2.6.16.54-0.2.5-smp
Local File System: xfs
Shared File System: --
System State: Multi-user, run level 3
Other Software: SGI ProPack 5 for Linux Service Pack 5

Interconnect Description: InfiniBand (MPI)

Hardware

Vendor: Mellanox Technologies
Model: MT26418 ConnectX
Switch Model: Mellanox MT47396 InfiniScale III
Number of Switches: 8
Number of Ports: 24
Data Rate: InfiniBand 4x DDR
Firmware: 2020001

Software

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Software Availability: Jan-2009

Interconnect Description: InfiniBand (MPI)

Topology: Bristle hypercube with express links
Primary Use: MPI traffic

Interconnect Description: InfiniBand (I/O)

| | Hardware | Software |
|---------------------|--------------------------------------|----------|
| Vendor: | Mellanox Technologies | |
| Model: | MT26418 ConnectX | |
| Switch Model: | Mellanox MT47396 InfiniScale-III | |
| Number of Switches: | 8 | |
| Number of Ports: | 24 | |
| Data Rate: | InfiniBand 4x DDR | |
| Firmware: | 2020001 | |
| Topology: | Bristle hypercube with express links | |
| Primary Use: | I/O traffic | |

Submit Notes

The config file option 'submit' was used.

General Notes

Software environment:

setenv MPI_REQUEST_MAX 65536

Determines the maximum number of nonblocking sends and receives that can simultaneously exist for any single MPI process. MPI generates an error message if this limit (or the default, if not set) is exceeded. Default: 16384

setenv MPI_TYPE_MAX 32768

Determines the maximum number of data types that can simultaneously exist for any single MPI process. MPI generates an error message if this limit (or the default, if not set) is exceeded. Default: 1024

setenv MPI_BUFS_THRESHOLD 1

Determines whether MPT uses per-host or per-process message buffers for communicating with other hosts. Per-host buffers are generally faster but for jobs running across many hosts they can consume a prodigious amount of memory. MPT will use per-host buffers for jobs using up to and including this many hosts and will use per-process buffers for larger host counts. Default: 64

setenv MPI_DSM_DISTRIBUTE

Activates NUMA job placement mode. This mode ensures that each MPI process gets a unique CPU and physical memory on the node with which that CPU is associated. Currently, the CPUs are chosen by simply starting at relative CPU 0 and incrementing

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General Notes (Continued)

until all MPI processes have been forked.

limit stacksize unlimited

Removes limits on the maximum size of the automatically-extended stack region of the current process and each process it creates.

PBS Pro batch scheduler (www.altair.com) is used with placement sets to ensure each MPI job is assigned to a topologically compact set of nodes

BIOS settings:

AMI BIOS version 8.15

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

Base Compiler Invocation

C benchmarks:

icc

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

Base Optimization Flags

C benchmarks:

-O3 -ipo -xT -no-prec-div

C++ benchmarks:

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Base Optimization Flags (Continued)

126.lammps: -O3 -ipo -xT -no-prec-div -ansi-alias

Fortran benchmarks:

-O3 -ipo -xT -no-prec-div

Benchmarks using both Fortran and C:

-O3 -ipo -xT -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/EM64T_Intel101_flags.20080611.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/mpi2007/flags/EM64T_Intel101_flags.20080611.xml

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

Tested with SPEC MPI2007 v1.1.

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