



SPEC® MPIM2007 Result

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Intel Corporation

Endeavor (Intel Xeon X5670, 2.93 GHz, DDR3-1333 MHz, SMT off, Turbo off)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 50.2

MPI2007 license: 13

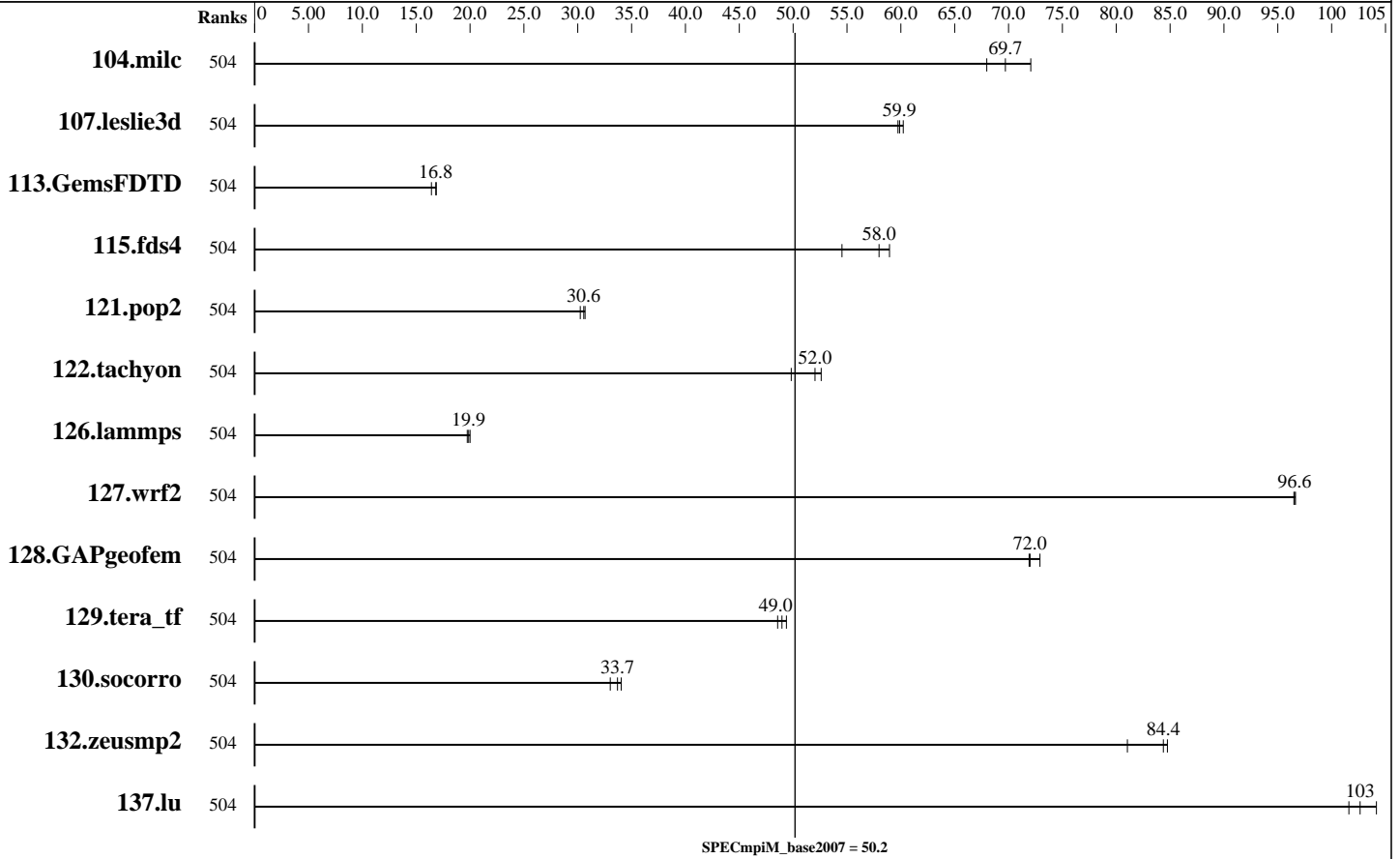
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Feb-2010

Hardware Availability: Mar-2010

Software Availability: Feb-2010



Results Table

| Benchmark | Base | | | | | | | | Peak | | | | | |
|---------------|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------|---------|-------|---------|-------|---------|-------|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 104.milc | 504 | 23.0 | 68.0 | 21.7 | 72.1 | <u>22.5</u> | <u>69.7</u> | | | | | | | |
| 107.leslie3d | 504 | <u>87.2</u> | <u>59.9</u> | 86.7 | 60.2 | 87.4 | 59.7 | | | | | | | |
| 113.GemsFDTD | 504 | 384 | 16.4 | <u>375</u> | <u>16.8</u> | 374 | 16.9 | | | | | | | |
| 115.fds4 | 504 | 35.8 | 54.5 | 33.1 | 58.9 | <u>33.7</u> | <u>58.0</u> | | | | | | | |
| 121.pop2 | 504 | <u>135</u> | <u>30.6</u> | 135 | 30.7 | 137 | 30.2 | | | | | | | |
| 122.tachyon | 504 | <u>53.8</u> | <u>52.0</u> | 53.2 | 52.6 | 56.1 | 49.8 | | | | | | | |
| 126.lammps | 504 | 146 | 20.0 | 148 | 19.7 | <u>147</u> | <u>19.9</u> | | | | | | | |
| 127.wrf2 | 504 | <u>80.7</u> | <u>96.6</u> | 80.7 | 96.6 | 80.8 | 96.5 | | | | | | | |
| 128.GAPgeofem | 504 | <u>28.7</u> | <u>72.0</u> | 28.3 | 72.9 | 28.7 | 71.9 | | | | | | | |
| 129.tera_tf | 504 | 56.1 | 49.4 | <u>56.5</u> | <u>49.0</u> | 57.0 | 48.6 | | | | | | | |

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 | 504 | <u>113</u> | <u>33.7</u> | 112 | 34.0 | 116 | 33.0 | | | | | | | |
| 132.zeusmp2 | 504 | <u>36.8</u> | <u>84.4</u> | 36.6 | 84.8 | 38.3 | 81.0 | | | | | | | |
| 137.lu | 504 | 35.3 | 104 | <u>35.8</u> | <u>103</u> | 36.2 | 102 | | | | | | | |

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: Endeavor Node
 Interconnects: IB Switch
 Gigabit Ethernet
 File Server Node: HOME
 Total Compute Nodes: 42
 Total Chips: 84
 Total Cores: 504
 Total Threads: 504
 Total Memory: 1008 GB
 Base Ranks Run: 504
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C++ Compiler 11.1.064 for Linux
 C++ Compiler: Intel C++ Compiler 11.1.064 for Linux
 Fortran Compiler: Intel Fortran Compiler 11.1.064 for Linux
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: MVAPICH 1.1
 Other MPI Info: None
 Pre-processors: No
 Other Software: None

Node Description: Endeavor Node

Hardware

Number of nodes: 42
 Uses of the node: compute
 Vendor: Intel
 Model: SR1600UR
 CPU Name: Intel Xeon X5670
 CPU(s) orderable: 1-2 chips
 Chips enabled: 2
 Cores enabled: 12
 Cores per chip: 6
 Threads per core: 1
 CPU Characteristics: Intel Turbo Boost Technology disabled, 6.4 GT/s QPI, Hyper-Threading disabled
 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: 12 MB I+D on chip per chip, 12 MB shared / 6 cores
 Other Cache: None
 Memory: 24 GB (RDIMM 6x4-GB DDR3-1333 MHz)
 Disk Subsystem: Seagate 400 GB ST3400755SS
 Other Hardware: None
 Adapter: Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller
 Number of Adapters: 1

Software

Adapter: Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller
 Adapter Driver: e1000
 Adapter Firmware: None
 Adapter: Mellanox MHQH29-XTC
 Adapter Driver: OFED 1.4.2
 Adapter Firmware: 2.7.000
 Operating System: Red Hat EL 5.4, kernel 2.6.18-164
 Local File System: Linux/ext2
 Shared File System: NFS
 System State: Multi-User
 Other Software: PBS Pro 10.1

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Software Availability: Feb-2010

Node Description: Endeavor Node

| | |
|---------------------|---------------------|
| Slot Type: | PCI-Express x8 |
| Data Rate: | 1Gbps Ethernet |
| Ports Used: | 2 |
| Interconnect Type: | Ethernet |
| Adapter: | Mellanox MHQH29-XTC |
| Number of Adapters: | 1 |
| Slot Type: | PCIe x8 Gen2 |
| Data Rate: | InfiniBand 4x QDR |
| Ports Used: | 1 |
| Interconnect Type: | InfiniBand |

Node Description: HOME

| | Hardware |
|----------------------|---|
| Number of nodes: | 1 |
| Uses of the node: | fileserver |
| Vendor: | Intel |
| Model: | SSR212CC |
| CPU Name: | Intel Xeon CPU |
| CPU(s) orderable: | 2 chips |
| Chips enabled: | 2 |
| Cores enabled: | 2 |
| Cores per chip: | 1 |
| Threads per core: | 1 |
| CPU Characteristics: | -- |
| CPU MHz: | 2800 |
| Primary Cache: | 12 KB I + 16 KB D on chip per chip |
| Secondary Cache: | 1 MB I+D on chip per chip |
| L3 Cache: | None |
| Other Cache: | None |
| Memory: | 6 GB |
| Disk Subsystem: | 10 disks, 320GB/disk, 2.6TB total |
| Other Hardware: | None |
| Adapter: | Intel 82546GB Dual-Port Gigabit Ethernet Controller |
| Number of Adapters: | 1 |
| Slot Type: | PCI-Express x8 |
| Data Rate: | 1Gbps Ethernet |
| Ports Used: | 1 |
| Interconnect Type: | Ethernet |

| | Software |
|---------------------|---|
| Adapter: | Intel 82546GB Dual-Port Gigabit Ethernet Controller |
| Adapter Driver: | e1000 |
| Adapter Firmware: | N/A |
| Operating System: | RedHat EL 4 Update 4 |
| Local File System: | None |
| Shared File System: | NFS |
| System State: | Multi-User |
| Other Software: | None |



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Software Availability: Feb-2010

Interconnect Description: IB Switch

| Hardware | Software |
|---|----------|
| Vendor: Mellanox Model: Mellanox MTS3600Q-1UNC Switch Model: Mellanox MTS3600Q-1UNC Number of Switches: 46 Number of Ports: 1656 Data Rate: InfiniBand 4x QDR Firmware: 7.1.000 Topology: Fat tree Primary Use: MPI traffic | |

Interconnect Description: Gigabit Ethernet

| Hardware | Software |
|---|----------|
| Vendor: Force10 Networks Model: Force10 S50, Force10 C300 Switch Model: Force10 S50, Force10 C300 Number of Switches: 15 Number of Ports: 748 Data Rate: 1Gbps Ethernet Firmware: 8.2.1.0 Topology: Fat tree Primary Use: Cluster File System | |

Submit Notes

The config file option 'submit' was used.

General Notes

MPI startup command:

mpirun command was used to start MPI jobs.

BIOS settings:

Intel Hyper-Threading Technology (SMT): Disabled (default is Enabled)

Intel Turbo Boost Technology (Turbo) : Disabled (default is Enabled)

RAM configuration:

Compute nodes have 1x4-GB RDIMM on each memory channel.

Network:

Forty six 36-port switches: 18 core switches and 28 leaf switches.

Each leaf has one link to each core. Remaining 18 ports on 25 of 28 leafs are used for compute nodes. On the remaining 3 leafs the ports are used for FS nodes and other peripherals.

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Standard Performance Evaluation Corporation

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General Notes (Continued)

Job placement:

Each MPI job was assigned to a topologically compact set of nodes, i.e. the minimal needed number of leaf switches was used for each job: 1 switch for 24/48/96/192 ranks, 2 switches for 384 ranks, 3 switches for 504 ranks.

PBS Pro was used for job submission. It has no impact on performance.

Can be found at: <http://www.altair.com>

Base Compiler Invocation

C benchmarks:

mpicc

C++ benchmarks:

126.lammps: mpicxx

Fortran benchmarks:

mpif90

Benchmarks using both Fortran and C:

mpicc mpif90

Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG

126.lammps: -DMPICH_IGNORE_CXX_SEEK

127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX

Base Optimization Flags

C benchmarks:

-O3 -xSSE4.2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xSSE4.2 -no-prec-div

Fortran benchmarks:

-O3 -xSSE4.2 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xSSE4.2 -no-prec-div



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The flags file that was used to format this result can be browsed at
http://www.spec.org/mpi2007/flags/EM64T_Intel111_flags.20120720.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/EM64T_Intel111_flags.20120720.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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