



SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Intel Corporation

Endeavor (Intel Xeon E7-8890 v3, 2.50 GHz,
DDR4-2133 MHz, SMT on, Turbo off)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 29.5

MPI2007 license: 13

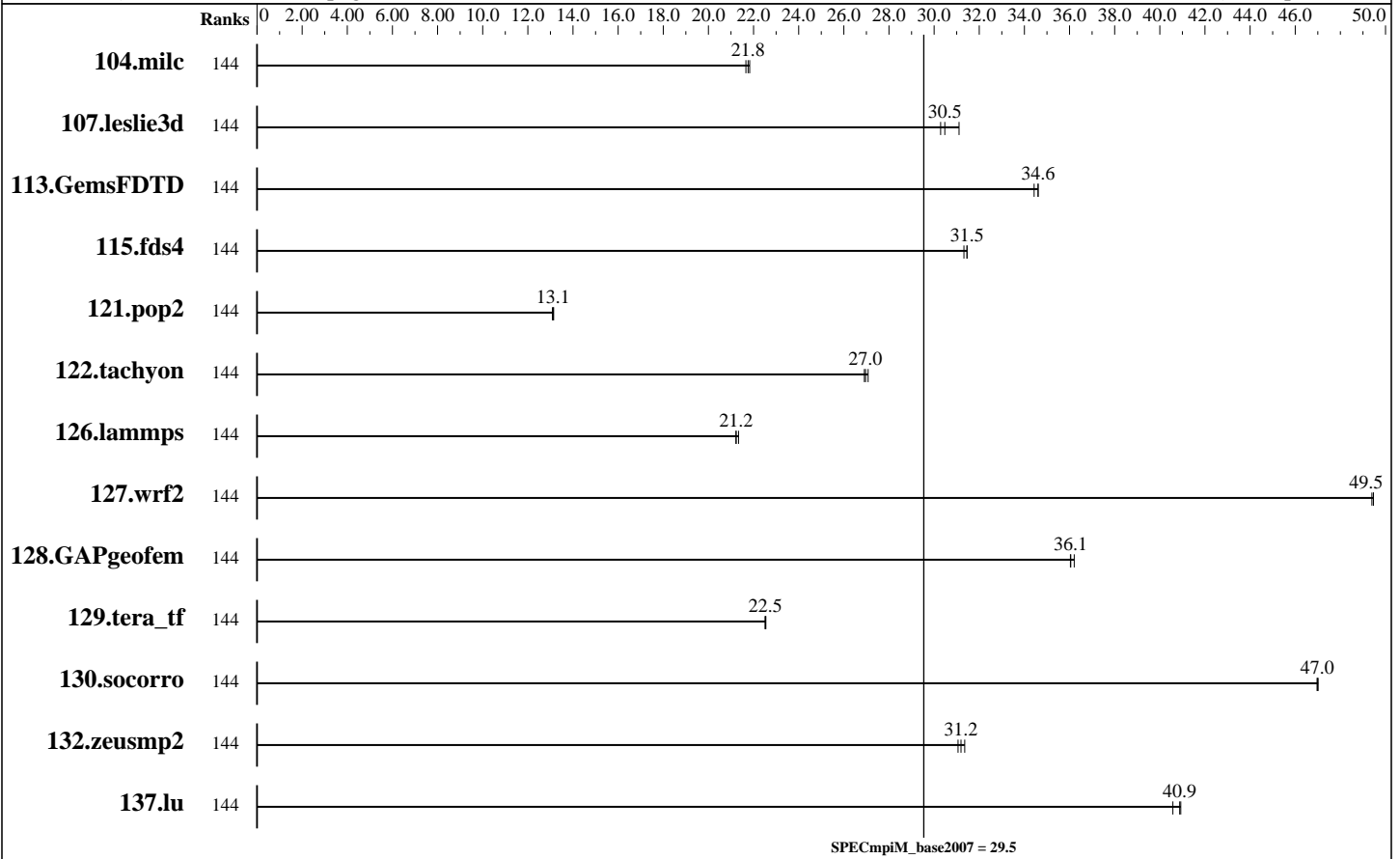
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: May-2015

Hardware Availability: May-2015

Software Availability: Apr-2015



Results Table

| Benchmark | Base | | | | | | | | Peak | | | | | | | |
|---------------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------|---------|-------|---------|-------|---------|-------|--|--|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | | |
| 104.milc | 144 | 72.3 | 21.7 | 71.7 | 21.8 | <u>71.9</u> | <u>21.8</u> | | | | | | | | | |
| 107.leslie3d | 144 | <u>171</u> | <u>30.5</u> | 172 | 30.3 | 168 | 31.1 | | | | | | | | | |
| 113.GemsFDTD | 144 | 183 | 34.4 | 182 | 34.6 | <u>182</u> | <u>34.6</u> | | | | | | | | | |
| 115.fds4 | 144 | 62.3 | 31.3 | <u>62.0</u> | <u>31.5</u> | 62.0 | 31.5 | | | | | | | | | |
| 121.pop2 | 144 | 315 | 13.1 | <u>315</u> | <u>13.1</u> | 314 | 13.1 | | | | | | | | | |
| 122.tachyon | 144 | 104 | 26.9 | 103 | 27.1 | <u>104</u> | <u>27.0</u> | | | | | | | | | |
| 126.lammps | 144 | 137 | 21.2 | 137 | 21.3 | <u>137</u> | <u>21.2</u> | | | | | | | | | |
| 127.wrf2 | 144 | 158 | 49.4 | <u>158</u> | <u>49.5</u> | 158 | 49.5 | | | | | | | | | |
| 128.GAPgeofem | 144 | <u>57.3</u> | <u>36.1</u> | 57.3 | 36.0 | 57.0 | 36.2 | | | | | | | | | |
| 129.tera_tf | 144 | 123 | 22.5 | <u>123</u> | <u>22.5</u> | 123 | 22.5 | | | | | | | | | |

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 | 144 | 81.2 | 47.0 | 81.2 | 47.0 | 81.3 | 47.0 | | | | | | | |
| 132.zeusmp2 | 144 | 99.9 | 31.1 | 99.5 | 31.2 | 99.0 | 31.4 | | | | | | | |
| 137.lu | 144 | 90.6 | 40.6 | 89.9 | 40.9 | 89.8 | 40.9 | | | | | | | |

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: Endeavor Node
 Interconnects: IB Switch
 Gigabit Ethernet
 File Server Node: NFS
 Total Compute Nodes: 2
 Total Chips: 8
 Total Cores: 144
 Total Threads: 288
 Total Memory: 1 TB
 Base Ranks Run: 144
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C++ Composer XE 2015 for Linux, Version 15.0.3.187 Build 20150407
 C++ Compiler: Intel C++ Composer XE 2015 for Linux, Version 15.0.3.187 Build 20150407
 Fortran Compiler: Intel Fortran Composer XE 2015 for Linux, Version 15.0.3.187 Build 20150407
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: Intel MPI Library 5.0.3.048 for Linux
 Other MPI Info: None
 Pre-processors: No
 Other Software: None

Node Description: Endeavor Node

Hardware

Number of nodes: 2
 Uses of the node: compute
 Vendor: Intel
 Model: S4TR2KU1Q
 CPU Name: Intel Xeon E7-8890 v3
 CPU(s) orderable: 1-4 chips
 Chips enabled: 4
 Cores enabled: 72
 Cores per chip: 18
 Threads per core: 2
 CPU Characteristics: Intel Turbo Boost Technology disabled, 9.6 GT/s QPI, Hyper-Threading enabled
 CPU MHz: 2500
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 45 MB I+D on chip per chip, 45 MB shared / 18 cores
 Other Cache: None
 Memory: 512 GB (32 x 16 GB 2Rx4 PC4-17000R-15, ECC)
 Disk Subsystem: ATA INTEL SSDSA2BZ20, SSDSC2BB80
 Other Hardware: None
 Adapter: Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller

Software

Adapter: Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller
 Adapter Driver: e1000
 Adapter Firmware: None
 Adapter: Mellanox MCX353A-FCAT ConnectX-3
 Adapter Driver: OFED 3.5-2-MIC-rc1
 Adapter Firmware: 2.31.5050
 Operating System: Red Hat EL 6.5, kernel 2.6.32-358
 Local File System: Linux/xfs
 Shared File System: NFS
 System State: Multi-User
 Other Software: IBM Platform LSF Standard 9.1.1.1

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Node Description: Endeavor Node

| | |
|---------------------|----------------------------------|
| Number of Adapters: | 1 |
| Slot Type: | PCI-Express x8 |
| Data Rate: | 1Gbps Ethernet |
| Ports Used: | 2 |
| Interconnect Type: | Ethernet |
| Adapter: | Mellanox MCX353A-FCAT ConnectX-3 |
| Number of Adapters: | 1 |
| Slot Type: | PCIe x8 Gen3 |
| Data Rate: | InfiniBand 4x FDR |
| Ports Used: | 1 |
| Interconnect Type: | InfiniBand |

Node Description: NFS

| Hardware | |
|----------------------|---|
| Number of nodes: | 1 |
| Uses of the node: | fileserver |
| Vendor: | Intel |
| Model: | S7000FC4UR |
| CPU Name: | Intel Xeon CPU |
| CPU(s) orderable: | 1-4 chips |
| Chips enabled: | 4 |
| Cores enabled: | 16 |
| Cores per chip: | 4 |
| Threads per core: | 2 |
| CPU Characteristics: | -- |
| CPU MHz: | 2926 |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 8 MB I+D on chip per chip, 4 MB shared / 2 cores |
| L3 Cache: | None |
| Other Cache: | None |
| Memory: | 64 GB |
| Disk Subsystem: | 8 disks, 500GB/disk, 2.7TB total |
| Other Hardware: | None |
| Adapter: | Intel 82563GB 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 82563GB Dual-Port Gigabit Ethernet Controller |
| Adapter Driver: | e1000e |
| Adapter Firmware: | N/A |
| Operating System: | RedHat EL 5 Update 4 |
| Local File System: | None |
| Shared File System: | NFS |
| System State: | Multi-User |
| Other Software: | None |



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Software Availability: Apr-2015

Interconnect Description: IB Switch

| Hardware | Software |
|--|----------|
| Vendor: Mellanox Model: Mellanox MSX6025F-1BFR Switch Model: Mellanox MSX6025F-1BFR Number of Switches: 46 Number of Ports: 36 Data Rate: InfiniBand 4x FDR Firmware: 9.2.8000 Topology: Fat tree Primary Use: MPI traffic | |

Interconnect Description: Gigabit Ethernet

| Hardware | Software |
|--|----------|
| Vendor: Force10 Networks, Cisco Systems Model: Force10 S50N, Force10 C300, Cisco WS-C4948E-F Switch Model: Force10 S50N, Force10 C300, Cisco WS-C4948E-F Number of Switches: 13 Number of Ports: 48 Data Rate: 1Gbps Ethernet, 10Gbps Ethernet Firmware: 8.3.2.0, 12.2(54)WO Topology: Star Primary Use: Cluster File System | |

Submit Notes

The config file option 'submit' was used.

General Notes

130.socorro (base): "nullify_ptrs" src.alt was used.

MPI startup command:

mpiexec.hydra command was used to start MPI jobs.

BIOS settings:

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

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

RAM configuration:

Compute nodes have 4x16-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

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General Notes (Continued)

for FS nodes and other peripherals.

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 72/144/288/576 ranks.

IBM Platform LSF was used for job submission. It has no impact on performance. Information can be found at: <http://www.ibm.com>

Base Compiler Invocation

C benchmarks:

mpiicc

C++ benchmarks:

126.lammps: mpiicpc

Fortran benchmarks:

mpiifort

Benchmarks using both Fortran and C:

mpiicc mpiifort

Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG
126.lammps: -DMPICH_IGNORE_CXX_SEEK
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

Fortran benchmarks:

-O3 -xCORE-AVX2 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX2 -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_Intel140_flags.20140908.html

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

http://www.spec.org/mpi2007/flags/EM64T_Intel140_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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