



# SPEC® MPIM2007 Result

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## Intel Corporation

Endeavor (Intel Xeon E7-4890 v2, 2.80 GHz,  
DDR3-1600 MHz, SMT on, Turbo off)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 55.7

MPI2007 license: 13

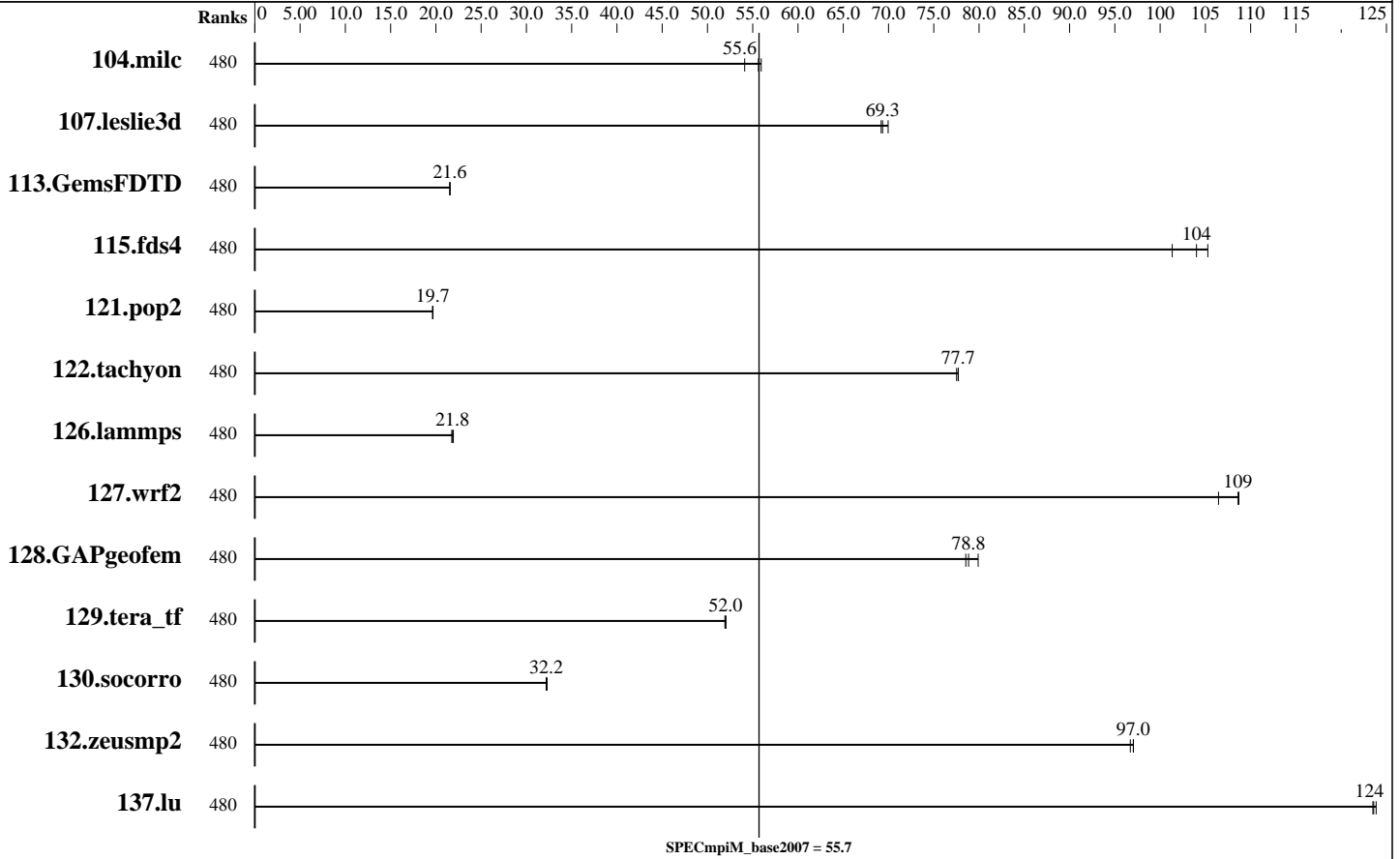
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Feb-2014

Hardware Availability: Feb-2014

Software Availability: Dec-2013



## Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	480	28.9	54.1	<b><u>28.1</u></b>	<b><u>55.6</u></b>	28.0	55.9									
107.leslie3d	480	<b><u>75.3</u></b>	<b><u>69.3</u></b>	74.6	70.0	75.4	69.2									
113.GemsFDTD	480	293	21.6	293	21.5	<b><u>293</u></b>	<b><u>21.6</u></b>									
115.fds4	480	<b><u>18.8</u></b>	<b><u>104</u></b>	19.3	101	18.5	105									
121.pop2	480	210	19.7	<b><u>210</u></b>	<b><u>19.7</u></b>	210	19.6									
122.tachyon	480	<b><u>36.0</u></b>	<b><u>77.7</u></b>	36.1	77.5	36.0	77.7									
126.lammps	480	134	21.8	<b><u>133</u></b>	<b><u>21.8</u></b>	133	21.9									
127.wrf2	480	71.7	109	<b><u>71.8</u></b>	<b><u>109</u></b>	73.2	106									
128.GAPgeofem	480	26.3	78.5	<b><u>26.2</u></b>	<b><u>78.8</u></b>	25.8	79.9									
129.tera_tf	480	53.3	51.9	53.2	52.0	<b><u>53.2</u></b>	<b><u>52.0</u></b>									

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	480	119	32.2	118	32.3	<u>119</u>	<u>32.2</u>							
132.zeusmp2	480	32.1	96.7	32.0	97.0	<u>32.0</u>	<u>97.0</u>							
137.lu	480	<u>29.7</u>	<u>124</u>	29.7	124	29.8	124							

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: 8  
 Total Chips: 32  
 Total Cores: 480  
 Total Threads: 960  
 Total Memory: 4 TB  
 Base Ranks Run: 480  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728  
 C++ Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728  
 Fortran Compiler: Intel Fortran Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: Intel MPI Library 4.1.3.045 for Linux  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: Endeavor Node

### Hardware

Number of nodes: 8  
 Uses of the node: compute  
 Vendor: Intel  
 Model: S4TR1SY4Q  
 CPU Name: Intel Xeon E7-4890 v2  
 CPU(s) orderable: 1-4 chips  
 Chips enabled: 4  
 Cores enabled: 60  
 Cores per chip: 15  
 Threads per core: 2  
 CPU Characteristics: Intel Turbo Boost Technology disabled, 8.0 GT/s QPI, Hyper-Threading enabled  
 CPU MHz: 2800  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 38400 KB I+D on chip per chip, 38400 KB shared / 15 cores  
 Other Cache: None  
 Memory: 512 GB (32 x 16 GB 2Rx4 PC3-12800R-11, ECC)  
 Disk Subsystem: 2 x 300 GB SAS HDDs  
 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 MCX353A-FCAT ConnectX-3  
 Adapter Driver: OFED 1.5.3.1  
 Adapter Firmware: 2.10.0  
 Operating System: Red Hat EL 6.4, kernel 2.6.32-358  
 Local File System: Linux/ext2  
 Shared File System: NFS  
 System State: Multi-User  
 Other Software: Platform LSF 9.1.1.1

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### Node Description: Endeavor Node

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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### 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: 7.2.0 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: 48 Data Rate: 1Gbps Ethernet, 10Gbps 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

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 60/120/240/480 ranks.

Platform LSF was used for job submission. It has no impact on performance. Information can be found at: <http://www.platform.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-AVX-I -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX-I -no-prec-div

Fortran benchmarks:

-O3 -xCORE-AVX-I -no-prec-div

Benchmarks using both Fortran and C:

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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.html](http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.html)

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

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel140\\_flags.xml](http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.xml)

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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