



# SPEC® MPIM2007 Result

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## Intel Corporation

Endeavor (Intel Xeon E5-2697 v3, 2.60 GHz, DDR4-2133 MHz, SMT on, Turbo on)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 27.0

MPI2007 license: 13

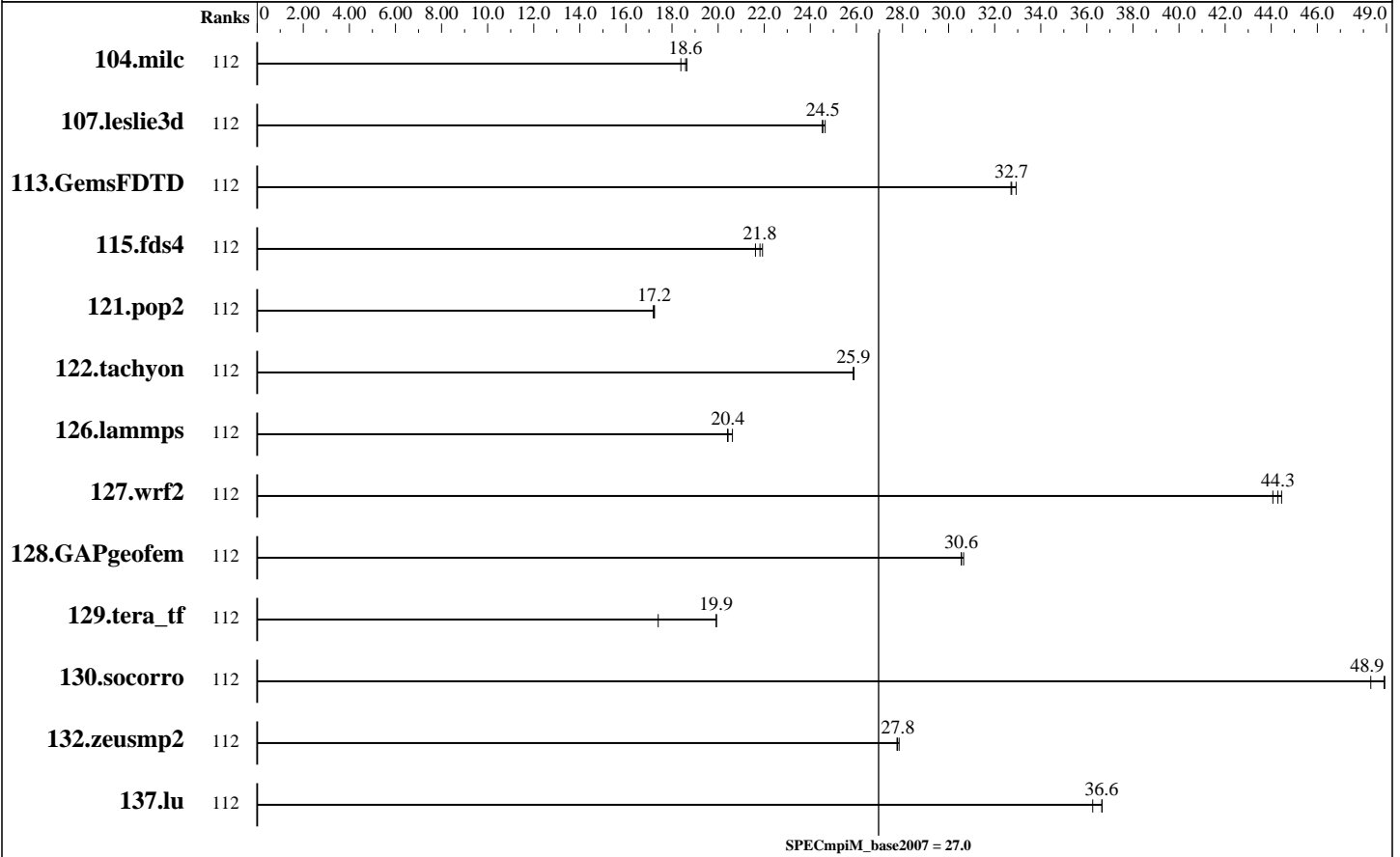
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Aug-2014

Hardware Availability: Sep-2014

Software Availability: May-2014



## Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	112	85.1	18.4	<b><u>84.2</u></b>	<b><u>18.6</u></b>	84.0	18.6									
107.leslie3d	112	212	24.6	213	24.5	<b><u>213</u></b>	<b><u>24.5</u></b>									
113.GemsFDTD	112	193	32.7	192	32.9	<b><u>193</u></b>	<b><u>32.7</u></b>									
115.fds4	112	<b><u>89.4</u></b>	<b><u>21.8</u></b>	89.0	21.9	90.2	21.6									
121.pop2	112	239	17.2	240	17.2	<b><u>240</u></b>	<b><u>17.2</u></b>									
122.tachyon	112	<b><u>108</u></b>	<b><u>25.9</u></b>	108	25.9	108	25.9									
126.lammps	112	<b><u>143</u></b>	<b><u>20.4</u></b>	143	20.4	141	20.6									
127.wrf2	112	177	44.1	175	44.4	<b><u>176</u></b>	<b><u>44.3</u></b>									
128.GAPgeofem	112	<b><u>67.6</u></b>	<b><u>30.6</u></b>	67.6	30.6	67.4	30.7									
129.tera_tf	112	139	19.9	159	17.4	<b><u>139</u></b>	<b><u>19.9</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	112	<b><u>78.1</u></b>	<b><u>48.9</u></b>	78.0	48.9	79.0	48.3							
132.zeusmp2	112	111	27.9	112	27.8	<b><u>112</u></b>	<b><u>27.8</u></b>							
137.lu	112	100	36.7	<b><u>100</u></b>	<b><u>36.6</u></b>	101	36.3							

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: 4  
 Total Chips: 8  
 Total Cores: 112  
 Total Threads: 224  
 Total Memory: 256 GB  
 Base Ranks Run: 112  
 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: 64-bit  
 MPI Library: Intel MPI Library 4.1.3.049 for Linux  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: Endeavor Node

### Hardware

Number of nodes: 4  
 Uses of the node: compute  
 Vendor: Intel  
 Model: R2208WTTYC1  
 CPU Name: Intel Xeon E5-2697 v3  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 28  
 Cores per chip: 14  
 Threads per core: 2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.6 GHz, 9.6 GT/s QPI, Hyper-Threading enabled  
 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: 35 MB I+D on chip per chip, 35 MB shared / 14 cores  
 Other Cache: None  
 Memory: 64 GB (8 x 8 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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Tested by: Pavel Shelepugin

Software Availability: May-2014

### 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: May-2014

### 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) : Enabled (default is Enabled)

RAM configuration:

Compute nodes have 2x8-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 28/56/112/224/448 ranks, 2 switches for 896 ranks, 4 switches for 1792 ranks, 8 switches for 3584 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

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

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

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](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](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](mailto:webmaster@spec.org).

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