



# SPEC® MPIM2007 Result

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## Intel Corporation

Discovery (Intel Xeon E7-8837, 2.67 GHz, DDR3-1066 MHz, Turbo off)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 15.4

MPI2007 license: 13

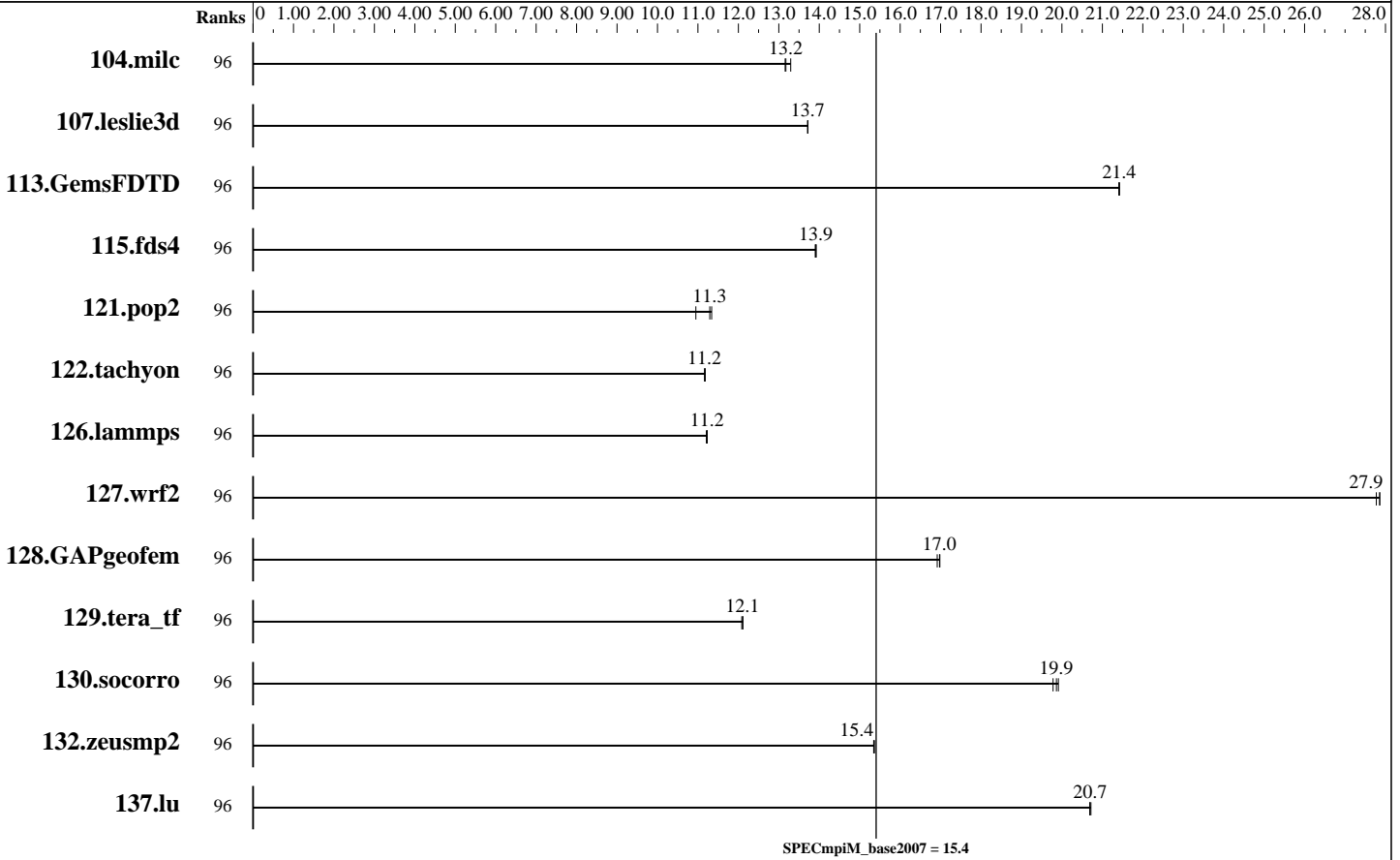
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Mar-2011

Hardware Availability: Apr-2011

Software Availability: Nov-2010



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	96	<b>119</b>	<b>13.2</b>	119	13.2	118	13.3							
107.leslie3d	96	381	13.7	<b>381</b>	<b>13.7</b>	381	13.7							
113.GemsFDTD	96	<b>295</b>	<b>21.4</b>	295	21.4	294	21.4							
115.fds4	96	140	13.9	140	13.9	<b>140</b>	<b>13.9</b>							
121.pop2	96	<b>366</b>	<b>11.3</b>	377	10.9	364	11.3							
122.tachyon	96	251	11.2	250	11.2	<b>250</b>	<b>11.2</b>							
126.lammps	96	<b>260</b>	<b>11.2</b>	260	11.2	260	11.2							
127.wrf2	96	<b>280</b>	<b>27.9</b>	281	27.8	280	27.9							
128.GAPgeofem	96	<b>122</b>	<b>17.0</b>	122	17.0	122	16.9							
129.tera_tf	96	229	12.1	<b>229</b>	<b>12.1</b>	229	12.1							

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	96	192	19.9	193	19.8	<u>192</u>	<u>19.9</u>							
132.zeusmp2	96	202	15.4	<u>202</u>	<u>15.4</u>	202	15.3							
137.lu	96	<u>178</u>	<u>20.7</u>	177	20.7	178	20.7							

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: Discovery Node  
 Interconnects: IB Switch  
 Gigabit Ethernet  
 File Server Node: HOME  
 Total Compute Nodes: 3  
 Total Chips: 12  
 Total Cores: 96  
 Total Threads: 96  
 Total Memory: 768 GB  
 Base Ranks Run: 96  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C++ Compiler 12.0.1.107 for Linux  
 C++ Compiler: Intel C++ Compiler 12.0.1.107 for Linux  
 Fortran Compiler: Intel Fortran Compiler 12.0.1.107 for Linux  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: Intel MPI Library 4.0.1.007 for Linux  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: Discovery Node

### Hardware

Number of nodes: 3  
 Uses of the node: compute  
 Vendor: Quanta  
 Model: QSSC-S4R  
 CPU Name: Intel Xeon E7-8837  
 CPU(s) orderable: 1-4 chips  
 Chips enabled: 4  
 Cores enabled: 32  
 Cores per chip: 8  
 Threads per core: 1  
 CPU Characteristics: Intel Turbo Boost Technology disabled, 6.4 GT/s QPI  
 CPU MHz: 2660  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 24 MB I+D on chip per chip, 24 MB shared / 8 cores  
 Other Cache: None  
 Memory: 256 GB (dual-rank RDIMM 32x8-GB DDR3-1066 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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### Node Description: Discovery 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

#### Software

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

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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### Interconnect Description: IB Switch

Hardware	Software
Vendor: Mellanox Model: Mellanox MTS3600Q-1UNC Switch Model: Mellanox MTS3600Q-1UNC Number of Switches: 46 Number of Ports: 36 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: 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

MPI startup command:

mpiexec.hydra command was used to start MPI jobs.

BIOS settings:

Intel Turbo Boost Technology (Turbo) : Disabled (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 for FS nodes and other peripherals.

Job placement:

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## General Notes (Continued)

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 32/64/96/128 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:  
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

## Base Optimization Flags

C benchmarks:  
-O3 -xSSE4.1 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xSSE4.1 -no-prec-div

Fortran benchmarks:  
-O3 -xSSE4.1 -no-prec-div

Benchmarks using both Fortran and C:  
-O3 -xSSE4.1 -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](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](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](mailto:webmaster@spec.org).

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