



SPEC® MPIM2007 Result

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Intel Corporation

Discovery (Intel Xeon E7-4870, 2.40 GHz,
DDR3-1066 MHz, SMT off, Turbo off)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 15.9

MPI2007 license: 13

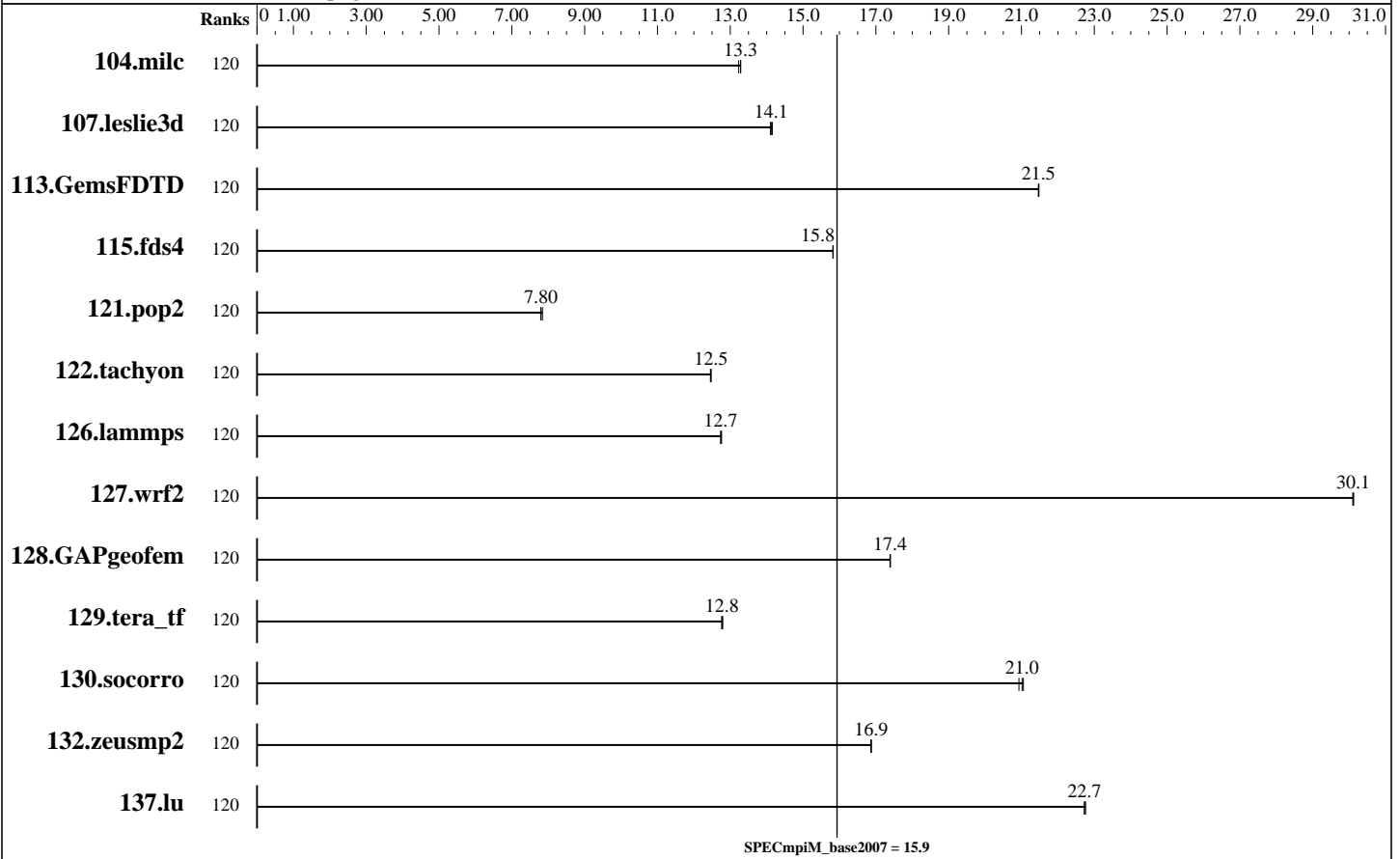
Test sponsor: Intel Corporation

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	120	118	13.2	<u>118</u>	<u>13.3</u>	118	13.3							
107.leslie3d	120	369	14.2	<u>370</u>	<u>14.1</u>	370	14.1							
113.GemsFDTD	120	294	21.5	<u>294</u>	<u>21.5</u>	294	21.5							
115.fds4	120	123	15.8	<u>123</u>	<u>15.8</u>	123	15.8							
121.pop2	120	526	7.84	530	7.79	<u>529</u>	<u>7.80</u>							
122.tachyon	120	225	12.5	224	12.5	<u>224</u>	<u>12.5</u>							
126.lammps	120	228	12.8	229	12.7	<u>229</u>	<u>12.7</u>							
127.wrf2	120	259	30.1	<u>259</u>	<u>30.1</u>	259	30.1							
128.GAPgeofem	120	119	17.4	119	17.4	<u>119</u>	<u>17.4</u>							
129.tera_tf	120	<u>217</u>	<u>12.8</u>	217	12.8	216	12.8							

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	120	<u>182</u>	<u>21.0</u>	181	21.1	182	20.9							
132.zeusmp2	120	<u>184</u>	<u>16.9</u>	184	16.9	184	16.9							
137.lu	120	162	22.8	162	22.7	<u>162</u>	<u>22.7</u>							

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: 120
 Total Threads: 120
 Total Memory: 768 GB
 Base Ranks Run: 120
 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 E7-4870
 CPU(s) orderable: 1-4 chips
 Chips enabled: 4
 Cores enabled: 40
 Cores per chip: 10
 Threads per core: 1
 CPU Characteristics: Intel Turbo Boost Technology disabled, 6.4 GT/s QPI, Hyper-Threading disabled
 CPU MHz: 2394
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 30 MB I+D on chip per chip, 30 MB shared / 10 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	
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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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 Hyper-Threading Technology (SMT): Disabled (default is Enabled)

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.

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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 40/80/120/160 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

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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