



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 = 20.1

MPI2007 license: 13

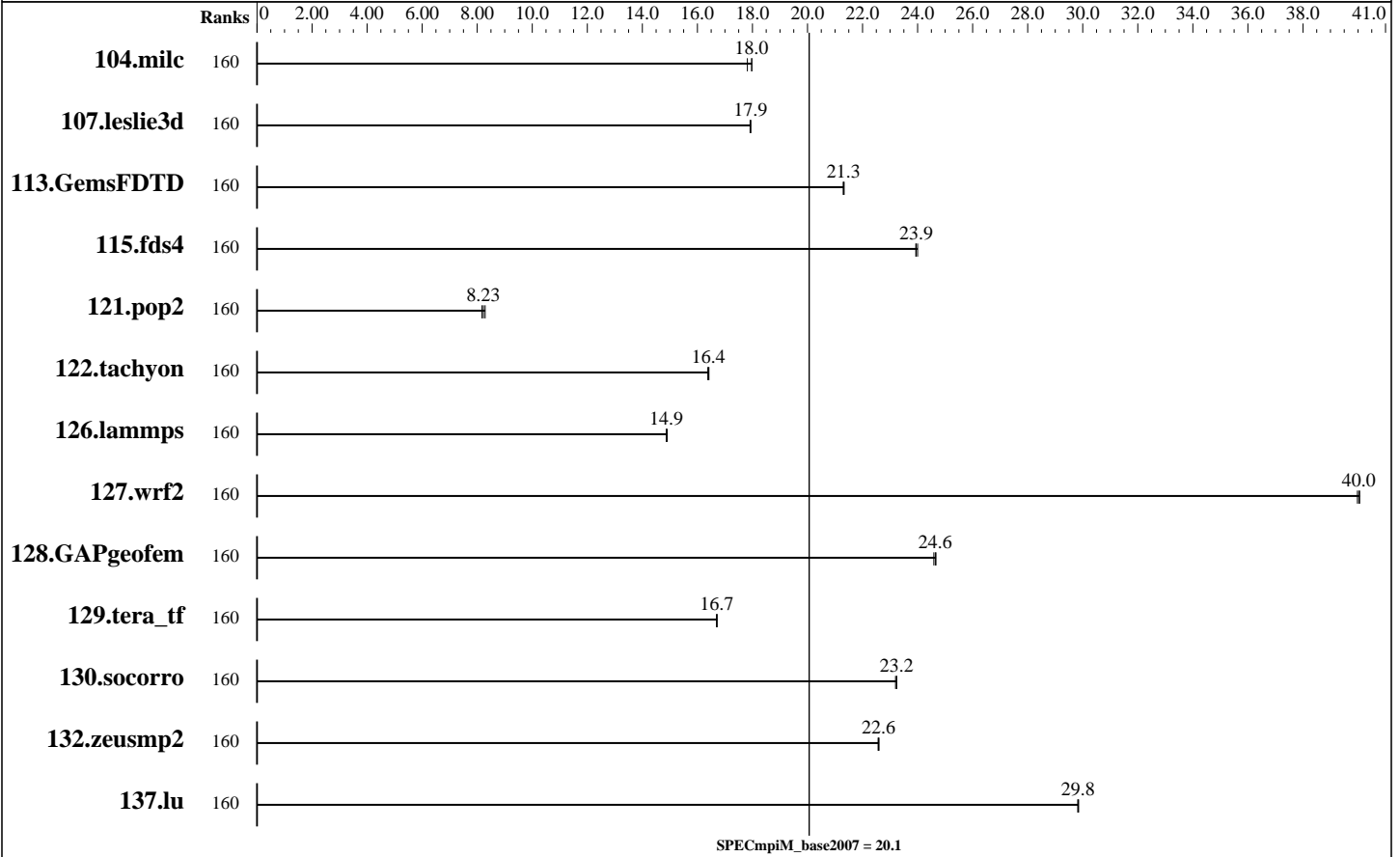
Test sponsor: Intel Corporation

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	160	87.8	17.8	<u>87.1</u>	<u>18.0</u>	87.1	18.0							
107.leslie3d	160	291	17.9	291	17.9	<u>291</u>	<u>17.9</u>							
113.GemsFDTD	160	296	21.3	296	21.3	<u>296</u>	<u>21.3</u>							
115.fds4	160	81.3	24.0	81.5	23.9	<u>81.5</u>	<u>23.9</u>							
121.pop2	160	498	8.29	<u>502</u>	<u>8.23</u>	505	8.17							
122.tachyon	160	<u>171</u>	<u>16.4</u>	170	16.4	171	16.4							
126.lammps	160	196	14.9	196	14.9	<u>196</u>	<u>14.9</u>							
127.wrf2	160	195	40.1	<u>195</u>	<u>40.0</u>	195	40.0							
128.GAPgeofem	160	84.0	24.6	<u>83.8</u>	<u>24.6</u>	83.7	24.7							
129.tera_tf	160	<u>166</u>	<u>16.7</u>	166	16.7	166	16.7							

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	160	165	23.2	164	23.2	164	23.2							
132.zeusmp2	160	137	22.6	138	22.6	137	22.6							
137.lu	160	123	29.8	123	29.8	123	29.9							

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: Discovery Node
 Interconnects: IB Switch
 Gigabit Ethernet
 File Server Node: HOME
 Total Compute Nodes: 4
 Total Chips: 16
 Total Cores: 160
 Total Threads: 160
 Total Memory: 1 TB
 Base Ranks Run: 160
 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: 4
 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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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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