



SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Intel Corporation

Discovery (Intel Xeon X7560, 2.27 GHz, DDR3-1066 MHz, SMT off, Turbo on)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 4.73

MPI2007 license: 13

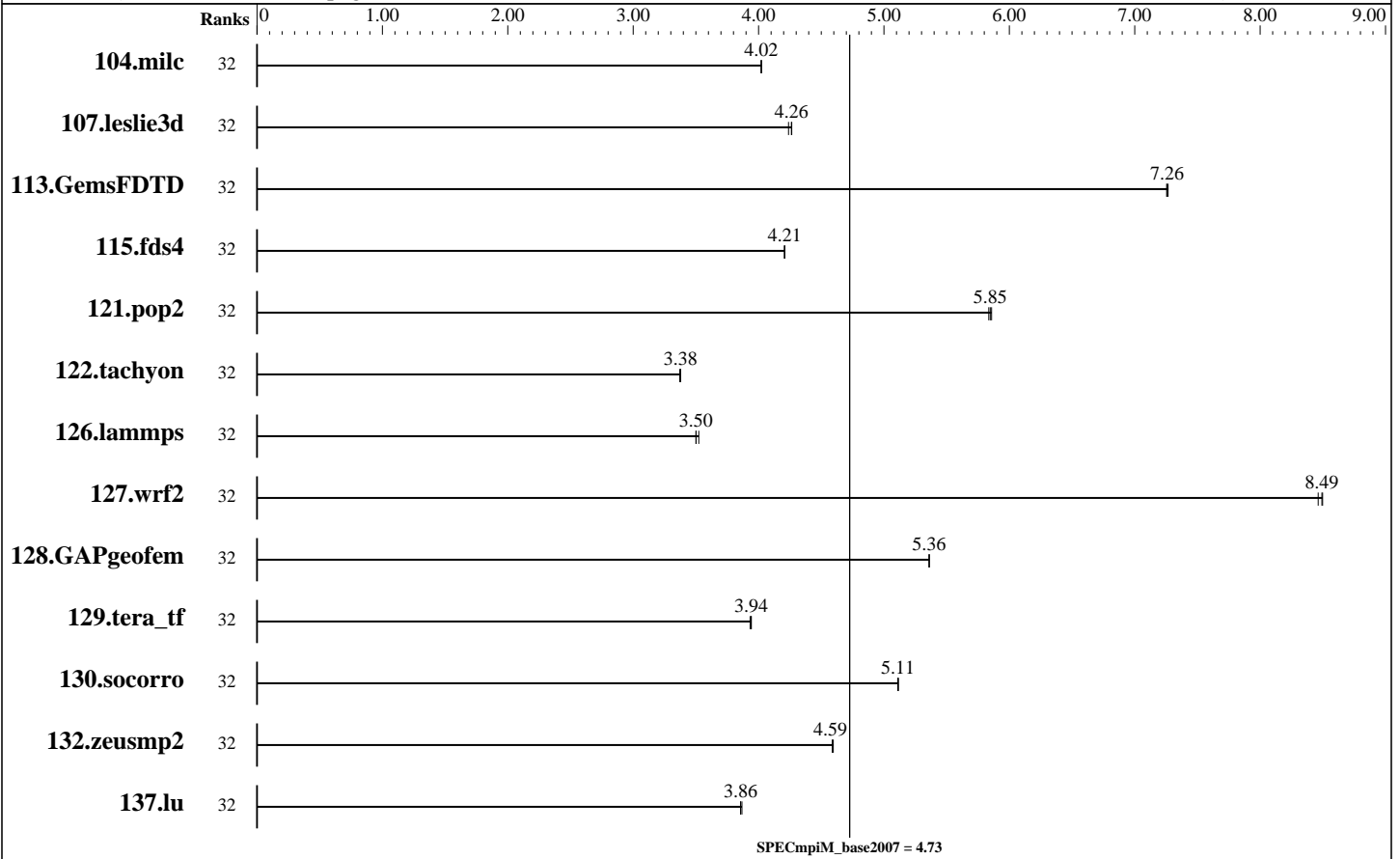
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Mar-2010

Hardware Availability: Mar-2010

Software Availability: Feb-2010



Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	32	389	4.02	<u>389</u>	<u>4.02</u>	389	4.02									
107.leslie3d	32	1224	4.26	<u>1225</u>	<u>4.26</u>	1231	4.24									
113.GemsFDTD	32	868	7.27	870	7.25	<u>869</u>	<u>7.26</u>									
115.fds4	32	464	4.21	<u>464</u>	<u>4.21</u>	464	4.21									
121.pop2	32	<u>706</u>	<u>5.85</u>	705	5.86	707	5.84									
122.tachyon	32	<u>828</u>	<u>3.38</u>	828	3.38	830	3.37									
126.lammps	32	827	3.52	<u>833</u>	<u>3.50</u>	833	3.50									
127.wrf2	32	917	8.50	<u>918</u>	<u>8.49</u>	921	8.46									
128.GAPgeofem	32	<u>385</u>	<u>5.36</u>	385	5.36	385	5.36									
129.tera_tf	32	702	3.94	<u>702</u>	<u>3.94</u>	704	3.93									

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	32	747	5.11	<u>747</u>	<u>5.11</u>	746	5.12									
132.zeusmp2	32	675	4.60	<u>676</u>	<u>4.59</u>	676	4.59									
137.lu	32	951	3.87	953	3.86	<u>953</u>	<u>3.86</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: 1
 Total Chips: 4
 Total Cores: 32
 Total Threads: 32
 Total Memory: 128 GB
 Base Ranks Run: 32
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C++ Compiler 11.1.064 for Linux
 C++ Compiler: Intel C++ Compiler 11.1.064 for Linux
 Fortran Compiler: Intel Fortran Compiler 11.1.064 for Linux
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: Intel MPI Library 3.2.2.006 for Linux
 Other MPI Info: None
 Pre-processors: No
 Other Software: None

Node Description: Discovery Node

Hardware

Number of nodes: 1
 Uses of the node: compute
 Vendor: Quanta
 Model: QSSC-S4R
 CPU Name: Intel Xeon X7560
 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 up to 2.66 GHz, 6.4 GT/s QPI, Hyper-Threading disabled
 CPU MHz: 2261
 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: 128 GB (dual-rank RDIMM 32x4-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
 Slot Type: PCI-Express x8

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

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

Interconnect Description: IB Switch

Hardware	
Vendor:	Mellanox
Model:	Mellanox MTS3600Q-1UNC

Software

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Interconnect Description: IB Switch

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:

mpirun command was used to start MPI jobs. This command starts an independent ring of mpd daemons, launches an MPI job, and shuts down the mpd ring upon the job termination.

BIOS settings:

Intel Hyper-Threading Technology (SMT): Disabled (default is Enabled)
Intel Turbo Boost Technology (Turbo) : Enabled (default is Enabled)

RAM configuration:

Compute nodes have 2x4-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 -xSSE4.2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xSSE4.2 -no-prec-div

Fortran benchmarks:
-O3 -xSSE4.2 -no-prec-div

Benchmarks using both Fortran and C:
-O3 -xSSE4.2 -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.20100202.html

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

http://www.spec.org/mpi2007/flags/EM64T_Intel111_flags.20100202.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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