



SPEC® MPIL2007 Result

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Intel Corporation

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

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 2.00

MPI2007 license: 13

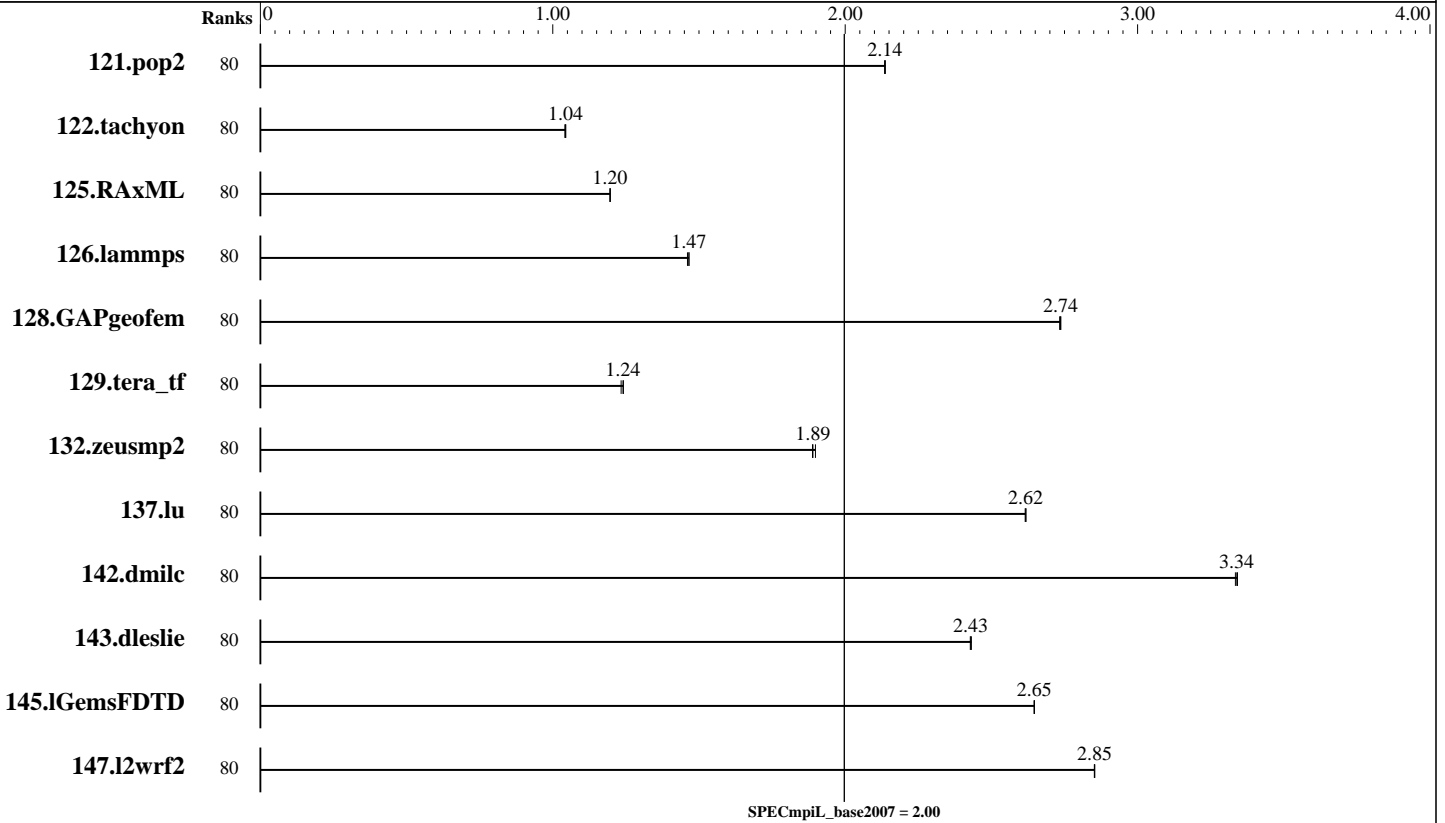
Test sponsor: Intel Corporation

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
121.pop2	80	1821	2.14	<u>1821</u>	<u>2.14</u>	1823	2.13							
122.tachyon	80	1862	1.04	<u>1862</u>	<u>1.04</u>	1867	1.04							
125.RAxML	80	2440	1.20	<u>2440</u>	<u>1.20</u>	2441	1.20							
126.lammps	80	1677	1.47	<u>1678</u>	<u>1.47</u>	1684	1.46							
128.GAPgeofem	80	<u>2169</u>	<u>2.74</u>	2171	2.73	2168	2.74							
129.tera_tf	80	885	1.24	891	1.23	<u>886</u>	<u>1.24</u>							
132.zeusmp2	80	1123	1.89	<u>1122</u>	<u>1.89</u>	1117	1.90							
137.lu	80	1605	2.62	1607	2.62	<u>1605</u>	<u>2.62</u>							
142.dmilc	80	1105	3.33	1102	3.34	<u>1103</u>	<u>3.34</u>							
143.dleslie	80	1277	2.43	<u>1276</u>	<u>2.43</u>	1275	2.43							
145.lGemsFDTD	80	1666	2.65	<u>1667</u>	<u>2.65</u>	1667	2.65							
147.l2wrf2	80	<u>2875</u>	<u>2.85</u>	2877	2.85	2875	2.85							

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Standard Performance Evaluation Corporation

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http://www.spec.org/



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Hardware Summary

Type of System: Homogeneous
 Compute Node: Discovery Node
 Interconnects: IB Switch
 Gigabit Ethernet
 File Server Node: HOME
 Total Compute Nodes: 2
 Total Chips: 8
 Total Cores: 80
 Total Threads: 80
 Total Memory: 512 GB
 Base Ranks Run: 80
 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: 2
 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
 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

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: HOME

Hardware		Software	
Number of nodes:	1	Adapter:	Intel 82546GB Dual-Port Gigabit Ethernet Controller
Uses of the node:	fileserver	Adapter Driver:	e1000
Vendor:	Intel	Adapter Firmware:	N/A
Model:	SSR212CC	Operating System:	RedHat EL 4 Update 4
CPU Name:	Intel Xeon CPU	Local File System:	None
CPU(s) orderable:	2 chips	Shared File System:	NFS
Chips enabled:	2	System State:	Multi-User
Cores enabled:	2	Other Software:	None
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		

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		



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Software Availability: Nov-2010

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.

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

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Base Compiler Invocation (Continued)

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

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

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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