SPEC® MPIM2007 Result

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Intel Corporation

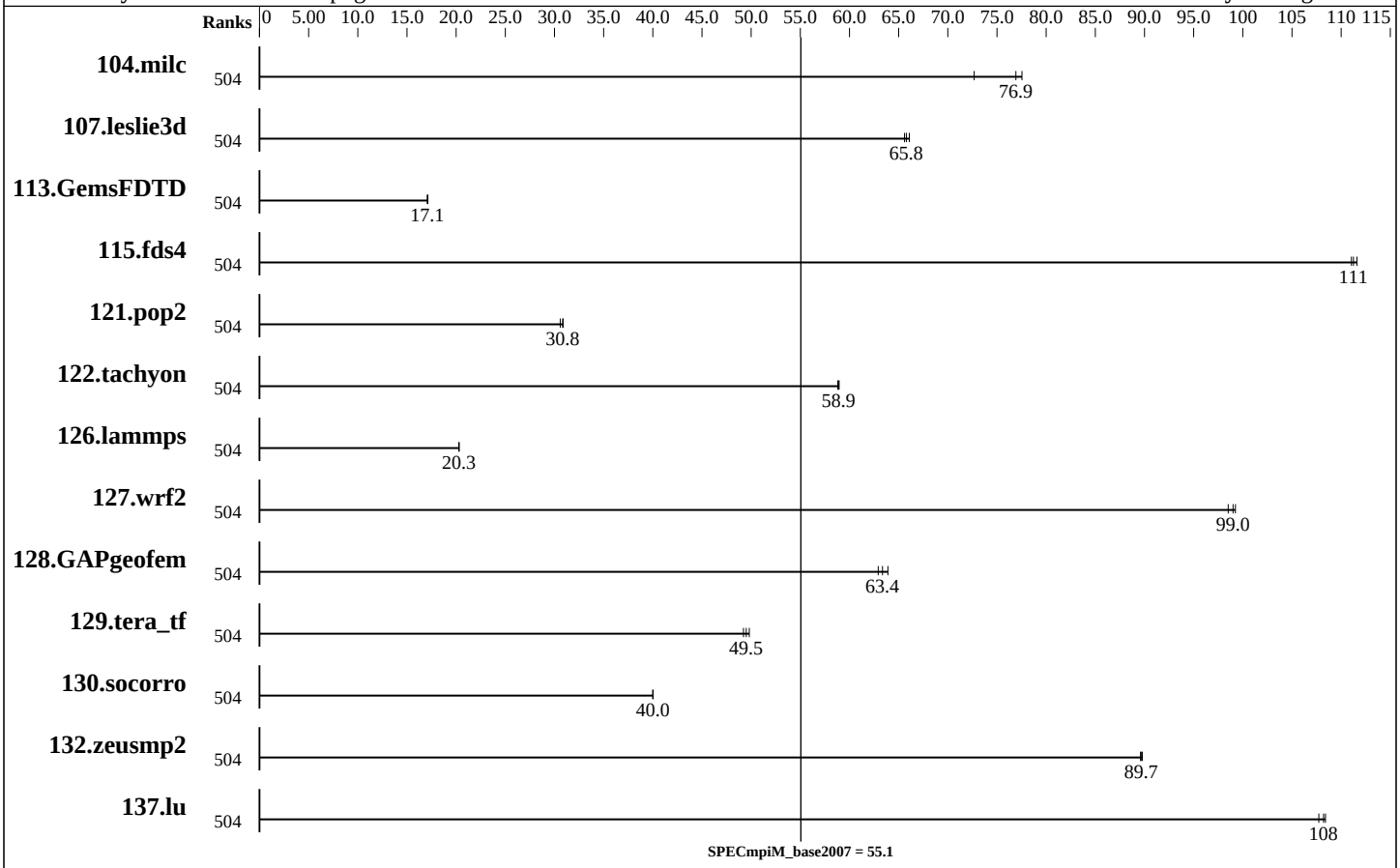
Endeavor (Intel Xeon X5670, 2.93 GHz,
DDR3-1333 MHz, SMT on, Turbo off)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 55.1

MPI2007 license: 13
Test sponsor: Intel Corporation
Tested by: Pavel Shelepugin

Test date: Jul-2010
Hardware Availability: Mar-2010
Software Availability: Aug-2010



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	504	21.5	72.7	**20.3**	**76.9**	20.2	77.5							
107.leslie3d	504	79.0	66.1	79.6	65.6	**79.4**	**65.8**							
113.GemsFDTD	504	368	17.1	369	17.1	**369**	**17.1**							
115.fds4	504	**17.5**	**111**	17.5	112	17.6	111							
121.pop2	504	135	30.6	**134**	**30.8**	134	30.9							
122.tachyon	504	47.6	58.8	47.4	58.9	**47.5**	**58.9**							
126.lammps	504	**144**	**20.3**	144	20.3	144	20.3							
127.wrf2	504	79.1	98.5	78.6	99.2	**78.7**	**99.0**							
128.GAPgeofem	504	32.8	62.9	32.3	63.9	**32.6**	**63.4**							
129.tera_tf	504	**55.9**	**49.5**	55.6	49.8	56.2	49.2							

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	504	**95.4**	**40.0**	95.4	40.0	95.4	40.0							
132.zeusmp2	504	34.6	89.8	34.6	89.6	**34.6**	**89.7**							
137.lu	504	33.9	108	**34.0**	**108**	34.1	108							

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:	Endeavor Node
Interconnects:	IB Switch Gigabit Ethernet
File Server Node:	HOME
Total Compute Nodes:	42
Total Chips:	84
Total Cores:	504
Total Threads:	1008
Total Memory:	1008 GB
Base Ranks Run:	504
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 4.0.1 for Linux
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: Endeavor Node

Hardware

Number of nodes:	42
Uses of the node:	compute
Vendor:	Intel
Model:	SR1600UR
CPU Name:	Intel Xeon X5670
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	12
Cores per chip:	6
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology disabled, 6.4 GT/s QPI, Hyper-Threading enabled
CPU MHz:	2934
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	12 MB I+D on chip per chip, 12 MB shared / 6 cores
Other Cache:	None
Memory:	24 GB (RDIMM 6x4-GB DDR3-1333 MHz)
Disk Subsystem:	Seagate 400 GB ST3400755SS
Other Hardware:	None
Adapter:	Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller
Number of Adapters:	1

Continued on next page

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: Endeavor 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	
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): Enabled (default is Enabled)
  Intel Turbo Boost Technology (Turbo)  : Disabled (default is Enabled)

RAM configuration:
  Compute nodes have 1x4-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 24/48/96/192 ranks, 2 switches for 384 ranks, 3 switches for 504 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`

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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