SPEC® MPIM2007 Result

Intel Corporation

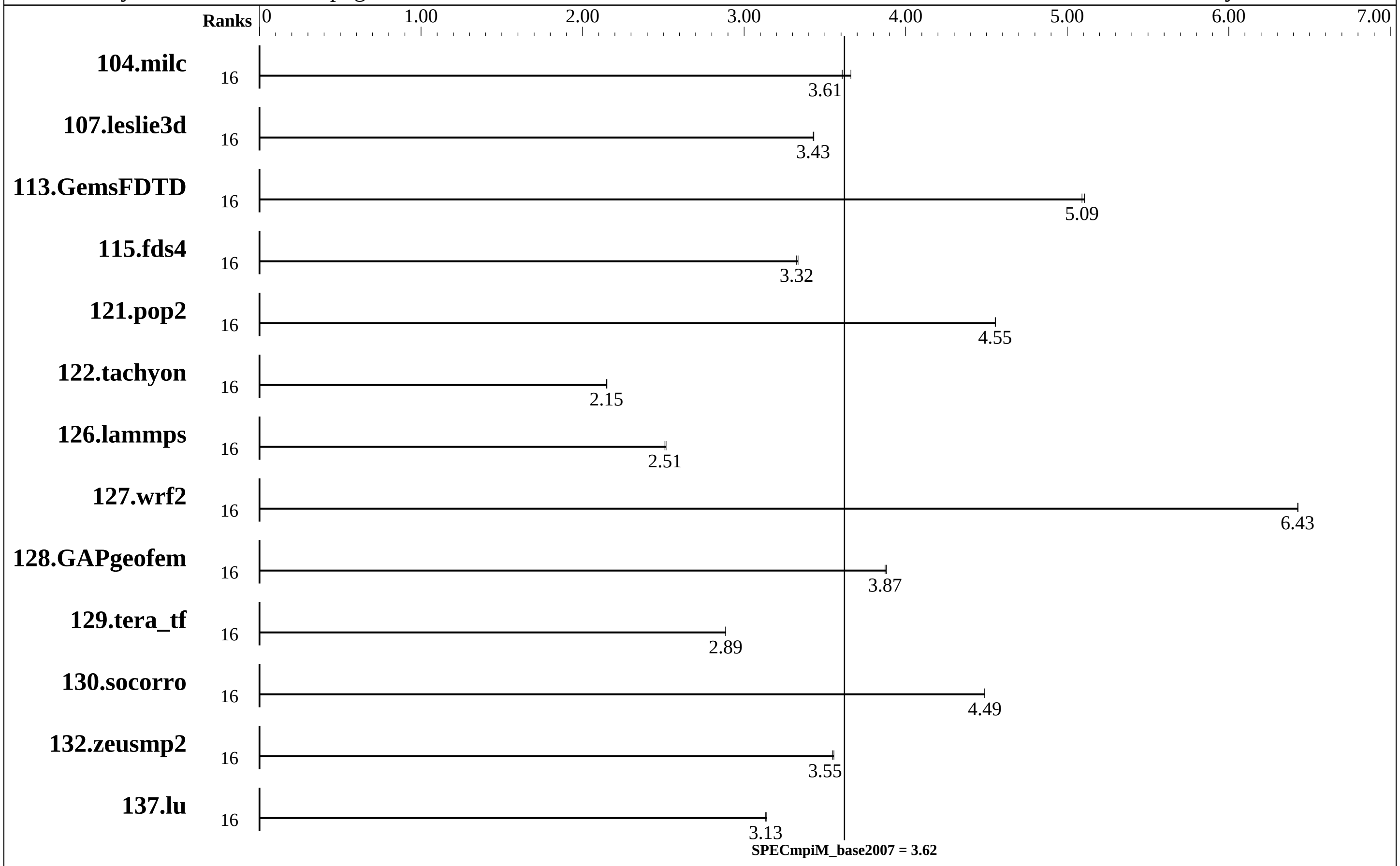
Endeavor (Intel Xeon X5560, 2.80 GHz, DDR3-1333 MHz, SMT off, Turbo on)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 3.62

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

Test date: Jul-2009
Hardware Availability: Jun-2009
Software Availability: Jun-2009



Results Table

	Base							Peak						
Benchmark	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	16	**434**	**3.61**	427	3.66									
107.leslie3d	16	1521	3.43	**1523**	**3.43**									
113.GemsFDTD	16	**1239**	**5.09**	1235	5.11									
115.fds4	16	**587**	**3.32**	585	3.33									
121.pop2	16	**906**	**4.55**	906	4.56									
122.tachyon	16	**1302**	**2.15**	1300	2.15									
126.lammps	16	1158	2.52	**1161**	**2.51**									
127.wrf2	16	**1213**	**6.43**	1213	6.43									
128.GAPgeofem	16	**533**	**3.87**	532	3.88									
129.tera_tf	16	959	2.89	**959**	**2.89**									

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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Tested by:	Pavel Shelepugin	**Software Availability:**	Jun-2009

Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	16	**850**	**4.49**	850	4.49									
132.zeusmp2	16	**875**	**3.55**	873	3.56									
137.lu	16	1171	3.14	**1173**	**3.13**									

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
Interconnect:	IB Switch
File Server Node:	LFS
Total Compute Nodes:	2
Total Chips:	4
Total Cores:	16
Total Threads:	16
Total Memory:	48 GB
Base Ranks Run:	16
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--

Software Summary

C Compiler:	Intel C++ Compiler 11.1 for Linux
C++ Compiler:	Intel C++ Compiler 11.1 for Linux
Fortran Compiler:	Intel Fortran Compiler 11.1 for Linux
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	Intel MPI Library 3.2 for Linux
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: Endeavor Node

Hardware

Number of nodes:	2
Uses of the node:	compute
Vendor:	Intel
Model:	SR1600UR
CPU Name:	Intel Xeon X5560
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	8
Cores per chip:	4
Threads per core:	1
CPU Characteristics:	Intel Turbo Boost Technology up to 3.2 GHz, 6.4 GT/s QPI, Hyper-Threading disabled
CPU MHz:	2800
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	8 MB I+D on chip per chip, 8 MB shared / 4 cores
Other Cache:	None
Memory:	24 GB (RDIMM 6x4-GB DDR3-1333 MHz)
Disk Subsystem:	Seagate 400 GB ST3400755SS
Other Hardware:	None
Adapter:	Mellanox MHQH29-XTC
Number of Adapters:	1
Slot Type:	PCIe x8 Gen2
Data Rate:	InfiniBand 4x QDR

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Software

Adapter:	Mellanox MHQH29-XTC
Adapter Driver:	OFED 1.3.1
Adapter Firmware:	2.6.000
Operating System:	Red Hat EL 5.2, kernel 2.6.18-128
Local File System:	Linux/ext2
Shared File System:	Lustre FS
System State:	Multi-User
Other Software:	PBS Pro 8.0

Node Description: Endeavor Node

Ports Used:	1
Interconnect Type:	InfiniBand

Node Description: LFS

Hardware

Number of nodes:	8
Uses of the node:	fileserver
Vendor:	Intel
Model:	SR1560SF
CPU Name:	Intel Xeon E5462
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	8
Cores per chip:	4
Threads per core:	1
CPU Characteristics:	1600 MHz FSB
CPU MHz:	2800
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	12 MB I+D on chip per chip, 6 MB shared / 2 cores
L3 Cache:	None
Other Cache:	None
Memory:	16 GB DDR2 16x1-GB 667 MHz
Disk Subsystem:	Seagate 250 GB
Other Hardware:	connected to DDN storage (see General Notes)
Adapter:	Mellanox MHGH28-XTC
Number of Adapters:	1
Slot Type:	PCIe x8 Gen2
Data Rate:	InfiniBand 4x DDR
Ports Used:	1
Interconnect Type:	InfiniBand

Software

Adapter:	Mellanox MHGH28-XTC
Adapter Driver:	OFED 1.3.1
Adapter Firmware:	2.6.000
Operating System:	Red Hat EL 5.2, kernel 2.6.18-53
Local File System:	None
Shared File System:	Lustre FS
System State:	Multi-User
Other Software:	None

Interconnect Description: IB Switch

Hardware

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, FS traffic

Software

Submit Notes

```
The config file option 'submit' was used.
```

General Notes

```
MPI startup command:
  mpiexec command was used to start MPI jobs. This command uses
  an independent ring of mpd daemons, which is started beforehand via
  mpdboot command. mpdboot was launched only once, and the corresponding
  ring of daemons was used for every iteration of each SPEC MPI component.
  So, the startup and tear-down time of the daemons was not included to
  the elapsed time and thus was not taken into account during calculation
  of the ratio.

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 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.

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 16/32/64/128 ranks, 2 switches for 256 ranks, 4 switches for 512 ranks.

Fileserver:
  Intel SR1560SF systems connected via IB to DataDirect Networks S2A9900
  storage which is: 160 disks, 300GB/disk, 48TB total, 35TB available.

PBS Pro was used for job submission. It has no impact on performance.
  Can be found at: http://www.altair.com

Lustre File System 1.6.6 was used. Download from:
  http://www.sun.com/software/products/lustre
```

Base Compiler Invocation

C benchmarks:

```
mpiicc
```

C++ benchmarks:

Continued on next page

Base Compiler Invocation (Continued)

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.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/EM64T_Intel111_flags.xml

Tested with SPEC MPI2007 v1.1.
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