SPEC® MPIM2007 Result

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Intel Corporation

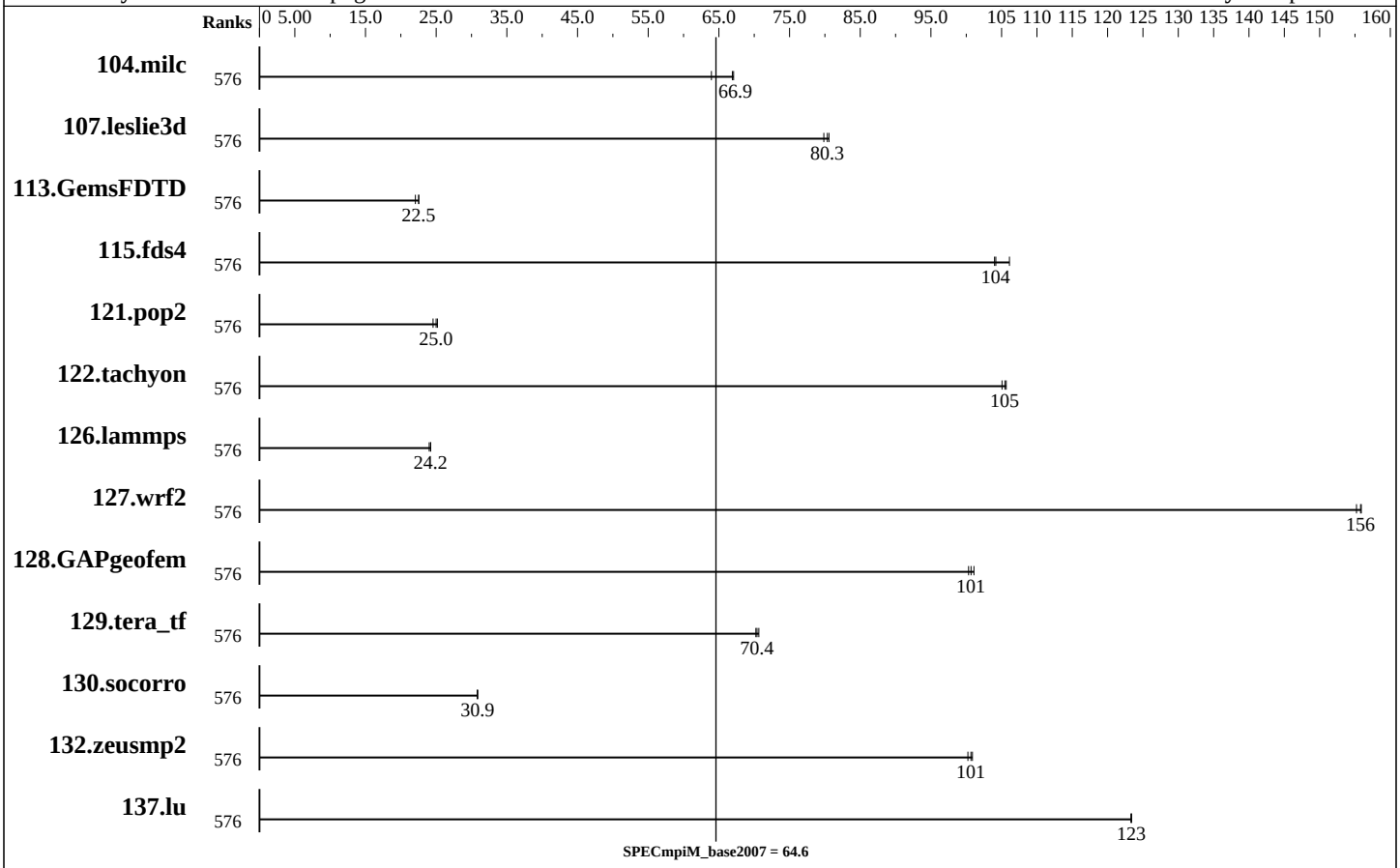
Endeavor (Intel Xeon E7-8890 v3, 2.50 GHz,
DDR4-2133 MHz, SMT on, Turbo on)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 64.6

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

Test date: May-2015
Hardware Availability: May-2015
Software Availability: Apr-2015



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	576	24.5	63.9	23.3	67.1	**23.4**	**66.9**							
107.leslie3d	576	65.4	79.8	64.8	80.6	**65.0**	**80.3**							
113.GemsFDTD	576	**280**	**22.5**	286	22.1	280	22.5							
115.fds4	576	**18.7**	**104**	18.4	106	18.8	104							
121.pop2	576	164	25.2	168	24.6	**165**	**25.0**							
122.tachyon	576	26.6	105	26.5	106	**26.5**	**105**							
126.lammps	576	**120**	**24.2**	121	24.0	120	24.2							
127.wrf2	576	**50.0**	**156**	50.2	155	50.0	156							
128.GAPgeofem	576	20.6	100	20.4	101	**20.5**	**101**							
129.tera_tf	576	39.4	70.2	39.2	70.7	**39.3**	**70.4**							

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	576	**124**	**30.9**	124	30.8	124	30.9							
132.zeusmp2	576	31.0	100	30.8	101	**30.8**	**101**							
137.lu	576	29.8	123	29.8	123	**29.8**	**123**							

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:	NFS
Total Compute Nodes:	8
Total Chips:	32
Total Cores:	576
Total Threads:	1152
Total Memory:	4 TB
Base Ranks Run:	576
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--

Software Summary

C Compiler:	Intel C++ Composer XE 2015 for Linux, Version 15.0.3.187 Build 20150407
C++ Compiler:	Intel C++ Composer XE 2015 for Linux, Version 15.0.3.187 Build 20150407
Fortran Compiler:	Intel Fortran Composer XE 2015 for Linux, Version 15.0.3.187 Build 20150407
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	Intel MPI Library 5.0.3.048 for Linux
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: Endeavor Node

Hardware

Number of nodes:	8
Uses of the node:	compute
Vendor:	Intel
Model:	S4TR2KU1Q
CPU Name:	Intel Xeon E7-8890 v3
CPU(s) orderable:	1-4 chips
Chips enabled:	4
Cores enabled:	72
Cores per chip:	18
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.3 GHz, 9.6 GT/s QPI, Hyper-Threading enabled
CPU MHz:	2500
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	45 MB I+D on chip per chip, 45 MB shared / 18 cores
Other Cache:	None
Memory:	512 GB (32 x 16 GB 2Rx4 PC4-17000R-15, ECC)
Disk Subsystem:	ATA INTEL SSDSA2BZ20, SSDSC2BB80
Other Hardware:	None
Adapter:	Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller

Continued on next page

Software

Adapter:	Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller
Adapter Driver:	e1000
Adapter Firmware:	None
Adapter:	Mellanox MCX353A-FCAT ConnectX-3
Adapter Driver:	OFED 3.5-2-MIC-rc1
Adapter Firmware:	2.31.5050
Operating System:	Red Hat EL 6.5, kernel 2.6.32-358
Local File System:	Linux/xfs
Shared File System:	NFS
System State:	Multi-User
Other Software:	IBM Platform LSF Standard 9.1.1.1

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Software Availability: Apr-2015

Node Description: Endeavor Node

Number of Adapters:	1
Slot Type:	PCI-Express x8
Data Rate:	1Gbps Ethernet
Ports Used:	2
Interconnect Type:	Ethernet
Adapter:	Mellanox MCX353A-FCAT ConnectX-3
Number of Adapters:	1
Slot Type:	PCIe x8 Gen3
Data Rate:	InfiniBand 4x FDR
Ports Used:	1
Interconnect Type:	InfiniBand

Node Description: NFS

Hardware

Number of nodes:	1
Uses of the node:	fileserver
Vendor:	Intel
Model:	S7000FC4UR
CPU Name:	Intel Xeon CPU
CPU(s) orderable:	1-4 chips
Chips enabled:	4
Cores enabled:	16
Cores per chip:	4
Threads per core:	2
CPU Characteristics:	--
CPU MHz:	2926
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	8 MB I+D on chip per chip, 4 MB shared / 2 cores
L3 Cache:	None
Other Cache:	None
Memory:	64 GB
Disk Subsystem:	8 disks, 500GB/disk, 2.7TB total
Other Hardware:	None
Adapter:	Intel 82563GB 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 82563GB Dual-Port Gigabit Ethernet Controller
Adapter Driver:	e1000e
Adapter Firmware:	N/A
Operating System:	RedHat EL 5 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 MSX6025F-1BFR	
Switch Model:	Mellanox MSX6025F-1BFR	
Number of Switches:	46	
Number of Ports:	36	
Data Rate:	InfiniBand 4x FDR	
Firmware:	9.2.8000	
Topology:	Fat tree	
Primary Use:	MPI traffic	

Interconnect Description: Gigabit Ethernet

Hardware		Software
Vendor:	Force10 Networks, Cisco Systems	
Model:	Force10 S50N, Force10 C300, Cisco WS-C4948E-F	
Switch Model:	Force10 S50N, Force10 C300, Cisco WS-C4948E-F	
Number of Switches:	13	
Number of Ports:	48	
Data Rate:	1Gbps Ethernet, 10Gbps Ethernet	
Firmware:	8.3.2.0, 12.2(54)WO	
Topology:	Star	
Primary Use:	Cluster File System	

Submit Notes

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

General Notes

```
130.socorro (base): "nullify_ptrs" src.alt was used.

129.tera_tf (base): "add_rank_support" src.alt was used.

 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)  : Enabled (default is Enabled)

 RAM configuration:
   Compute nodes have 4x16-GB RDIMM on each memory channel.

 Network:
   Forty six 36-port switches: 18 core switches and 28 leaf switches.
```

Continued on next page

General Notes (Continued)

```
    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 72/144/288/576 ranks.

  IBM Platform LSF was used for job submission. It has no impact on performance.
    Information can be found at: http://www.ibm.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`
130.socorro: `-assume nostd_intent_in`

Base Optimization Flags

C benchmarks:
`-O3 -xCORE-AVX2 -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -xCORE-AVX2 -no-prec-div`

Fortran benchmarks:
`-O3 -xCORE-AVX2 -no-prec-div`

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
`-O3 -xCORE-AVX2 -no-prec-div`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20140908.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20140908.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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