SPEC® MPIM2007 Result

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Intel Corporation

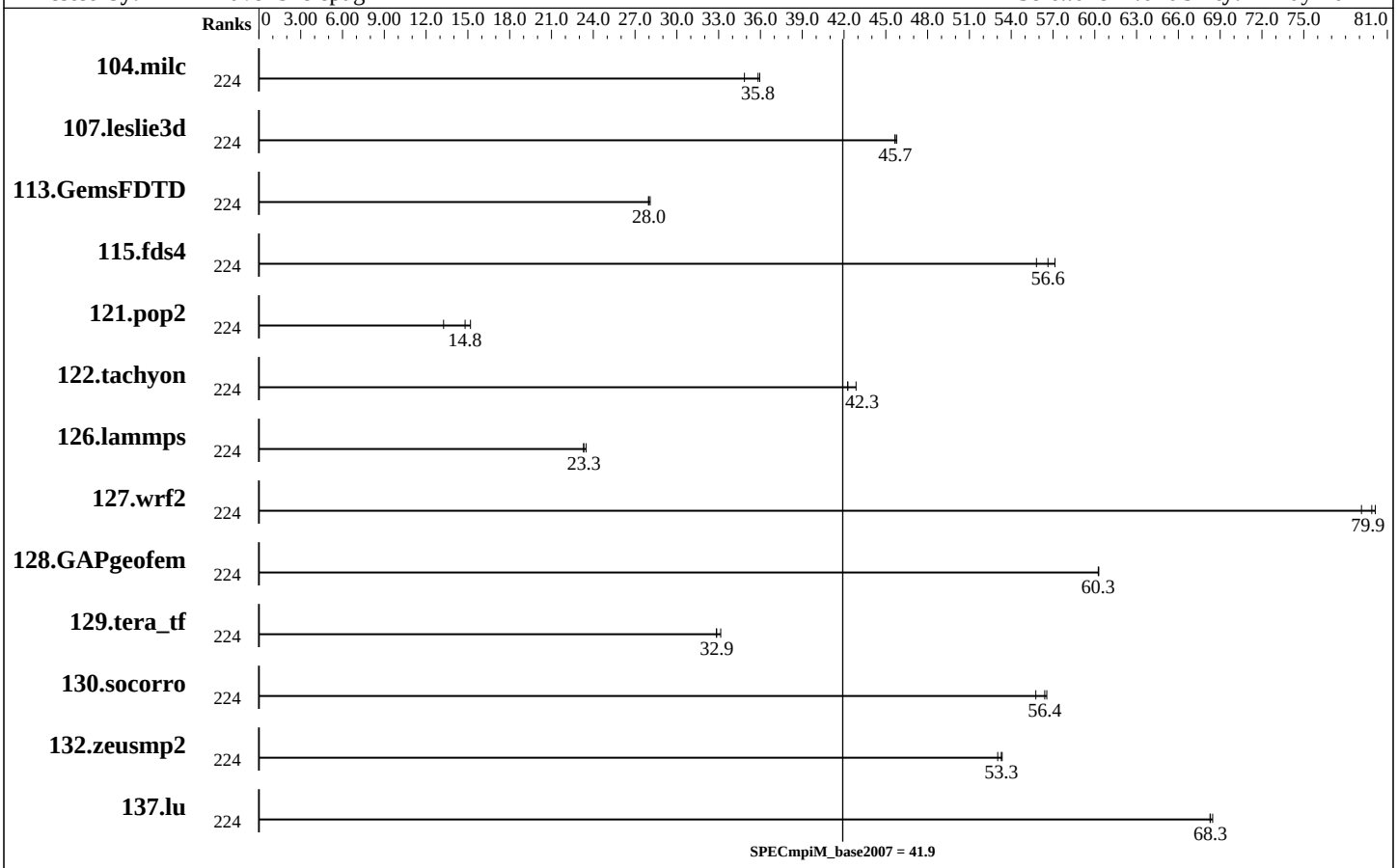
Endeavor (Intel Xeon E5-2697 v3, 2.60 GHz,
DDR4-2133 MHz, SMT on, Turbo off)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 41.9

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

Test date: Aug-2014
Hardware Availability: Sep-2014
Software Availability: May-2014



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	224	44.9	34.9	**43.7**	**35.8**	43.5	35.9							
107.leslie3d	224	114	45.8	114	45.7	**114**	**45.7**							
113.GemsFDTD	224	225	28.1	**225**	**28.0**	226	28.0							
115.fds4	224	34.1	57.1	**34.4**	**56.6**	35.0	55.8							
121.pop2	224	**279**	**14.8**	272	15.2	311	13.3							
122.tachyon	224	**66.2**	**42.3**	65.3	42.9	66.2	42.3							
126.lammps	224	125	23.3	124	23.5	**125**	**23.3**							
127.wrf2	224	98.5	79.1	**97.6**	**79.9**	97.3	80.1							
128.GAPgeofem	224	**34.3**	**60.3**	34.3	60.3	34.3	60.2							
129.tera_tf	224	84.3	32.8	**84.2**	**32.9**	83.5	33.1							

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	224	67.5	56.6	**67.7**	**56.4**	68.4	55.8							
132.zeusmp2	224	58.2	53.4	**58.2**	**53.3**	58.5	53.0							
137.lu	224	53.7	68.5	53.8	68.3	**53.8**	**68.3**							

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: 16
Total Cores: 224
Total Threads: 448
Total Memory: 512 GB
Base Ranks Run: 224
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422
C++ Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422
Fortran Compiler: Intel Fortran Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422
Base Pointers: 64-bit
Peak Pointers: 64-bit
MPI Library: Intel MPI Library 4.1.3.049 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: R2208WTTYC1
CPU Name: Intel Xeon E5-2697 v3
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 28
Cores per chip: 14
Threads per core: 2
CPU Characteristics: Intel Turbo Boost Technology disabled, 9.6 GT/s QPI, Hyper-Threading enabled
CPU MHz: 2600
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 35 MB I+D on chip per chip, 35 MB shared / 14 cores
Other Cache: None
Memory: 64 GB (8 x 8 GB 2Rx4 PC4-17000R-15, ECC)
Disk Subsystem: ATA INTEL SSDSA2BZ20, SSDSC2BB80
Other Hardware: None
Adapter: Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller

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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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Test sponsor: Intel Corporation
Tested by: Pavel Shelepugin

Test date: Aug-2014
Hardware Availability: Sep-2014
Software Availability: May-2014

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

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.

 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 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
```

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General Notes (Continued)

```
    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 28/56/112/224/448 ranks, 2 switches for 896 ranks, 4 switches for 1792 ranks,
    8 switches for 3584 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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