SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Intel Corporation

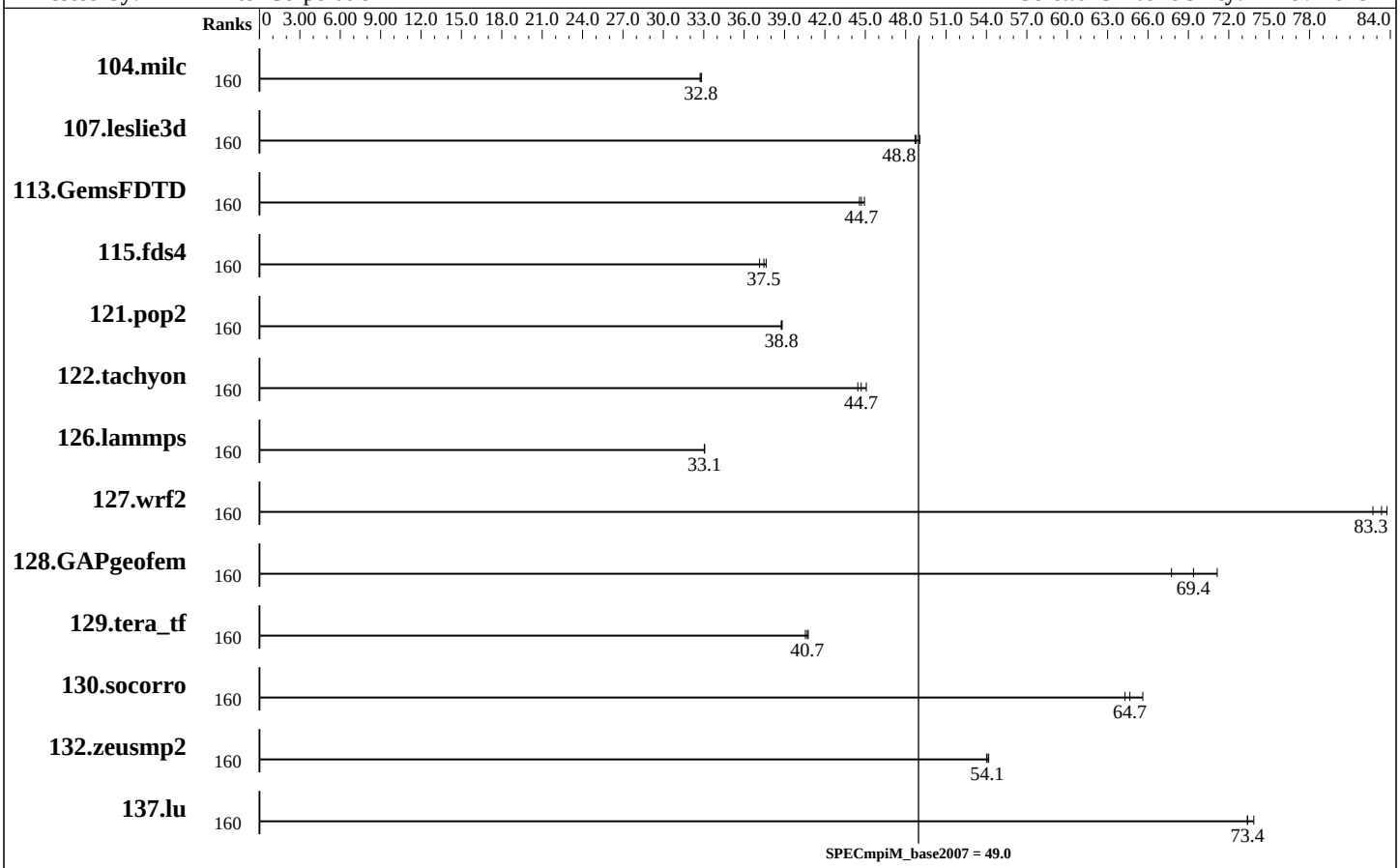
Endeavor (Intel Xeon Gold 6148, 2.40 GHz,
DDR4-2666 MHz, SMT on, Turbo on)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 49.0

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

Test date: Aug-2018
Hardware Availability: Aug-2018
Software Availability: Nov-2018



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	160	47.7	32.8	47.8	32.7	**47.7**	**32.8**							
107.leslie3d	160	106	49.1	**107**	**48.8**	107	48.7							
113.GemsFDTD	160	140	44.9	142	44.6	**141**	**44.7**							
115.fds4	160	**52.1**	**37.5**	52.5	37.1	51.8	37.6							
121.pop2	160	**106**	**38.8**	106	38.8	107	38.8							
122.tachyon	160	62.1	45.1	**62.6**	**44.7**	62.9	44.4							
126.lammps	160	88.2	33.0	**88.2**	**33.1**	88.2	33.1							
127.wrf2	160	**93.5**	**83.3**	93.1	83.8	94.3	82.7							
128.GAPgeofem	160	**29.8**	**69.4**	29.0	71.1	30.5	67.7							
129.tera_tf	160	**68.0**	**40.7**	68.3	40.5	67.9	40.8							

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

SPEC MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Intel Corporation

Endeavor (Intel Xeon Gold 6148, 2.40 GHz, DDR4-2666 MHz, SMT on, Turbo on)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 49.0

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

Test date: Aug-2018
Hardware Availability: Aug-2018
Software Availability: Nov-2018

Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	160	58.2	65.6	**59.0**	**64.7**	59.4	64.3							
132.zeusmp2	160	57.5	54.0	57.3	54.2	**57.4**	**54.1**							
137.lu	160	50.1	73.4	49.8	73.9	**50.1**	**73.4**							

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:	Intel Server System R2208WFTZS
Interconnect:	Intel Omni-Path 100 series
File Server Node:	Lustre FS
Total Compute Nodes:	4
Total Chips:	8
Total Cores:	160
Total Threads:	320
Total Memory:	768 GB
Base Ranks Run:	160
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--

Software Summary

C Compiler:	Intel C++ Composer XE 2018 for Linux Version 18.0.0 Build 20170811
C++ Compiler:	Intel C++ Composer XE 2018 for Linux Version 18.0.0 Build 20170811
Fortran Compiler:	Intel Fortran Composer XE 2018 for Linux Version 18.0.0 Build 20170811
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	Intel MPI Library 2019 Build 20180829
Other MPI Info:	libfabric-1.6.1
Pre-processors:	No
Other Software:	None

Node Description: Intel Server System R2208WFTZS

Hardware

Number of nodes:	4
Uses of the node:	Compute
Vendor:	Intel
Model:	Intel Server System R2208WFTZS
CPU Name:	Intel Xeon Gold 6148
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	40
Cores per chip:	20
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.7 GHz
CPU MHz:	2400
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	27.5 MB I+D on chip per chip
Other Cache:	None
Memory:	192 GB (16 x 12 GB 2Rx4 DDR4-2666)
Disk Subsystem:	ATA INTEL SSDSC2BA80
Other Hardware:	None
Adapter:	Intel Omni-Path Edge Switch 100 series
Number of Adapters:	1
Slot Type:	PCI-Express x16
Data Rate:	12.5 GB/s
Ports Used:	1

Continued on next page

Software

Adapter:	Intel Omni-Path Edge Switch 100 series
Adapter Driver:	IFS 10.7
Adapter Firmware:	1.26.1
Operating System:	Oracle Linux Server release 7.4
Local File System:	Linux/xfs
Shared File System:	Lustre FS
System State:	Multi-User
Other Software:	IBM Platform LSF Standard 9.1.1.1

SPEC MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Intel Corporation

Endeavor (Intel Xeon Gold 6148, 2.40 GHz, DDR4-2666 MHz, SMT on, Turbo on)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 49.0

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

Test date: Aug-2018
Hardware Availability: Aug-2018
Software Availability: Nov-2018

Node Description: Intel Server System R2208WFTZS

Interconnect Type:	Intel Omni-Path Fabric 100 series

Node Description: Lustre FS

Hardware

Number of nodes:	11
Uses of the node:	Fileserver
Vendor:	Intel
Model:	Intel Server System R2208GZ4GC4
CPU Name:	Intel Xeon E5-2680
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	16
Cores per chip:	8
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.5 GHz
CPU MHz:	2700
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	2 MB I+D on chip per chip
L3 Cache:	None
Other Cache:	None
Memory:	64 GB per node (8 x 8 GB 1600MHz Reg ECC DDR3)
Disk Subsystem:	136 TB 3 RAID with 8 SAS/SATA
Other Hardware:	None
Adapter:	Intel Omni-Path Fabric Adapter 100 series
Number of Adapters:	1
Slot Type:	PCI-Express x16
Data Rate:	12.5 GB/s
Ports Used:	1
Interconnect Type:	Intel Omni-Path Fabric 100 series

Software

Adapter:	Intel Omni-Path Fabric Adapter 100 series
Adapter Driver:	IFS 10.7
Adapter Firmware:	1.26.1
Operating System:	Redhat Enterprise Linux Server Release 7.4
Local File System:	None
Shared File System:	Lustre FS
System State:	Multi-User
Other Software:	None

Interconnect Description: Intel Omni-Path 100 series

Hardware

Vendor:	Intel
Model:	Intel Omni-Path Fabric 100 series
Switch Model:	Intel Omni-Path Edge Switch 100 series
Number of Switches:	24
Number of Ports:	48
Data Rate:	12.5 GB/s
Firmware:	1.26.1
Topology:	Fat tree
Primary Use:	MPI and I/O traffic

Software

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.
143.dleslie (base): "integer_overflow" src.alt was used.

MPI startup command:
   mpiexec.hydra command was used to start MPI jobs.
   export I_MPI_FABRICS=shm:ofi
   export FI_PSM2_INJECT_SIZE=8192
   export I_MPI_PIN_DOMAIN=core
   export I_MPI_PIN_ORDER=bunch
   export FI_PSM2_DELAY=0
   export FI_PSM2_LAZY_CONN=1
   export I_MPI_COMPATIBILITY=3
Spectre & Meltdown:
   Kernel: 3.10.0-862.11.6.el7.crt1.x86_64
   Microcode: 0x200004d
   l1tf: Mitigation: PTE Inversion
   meltdown: Mitigation: PTI
   spec_store_bypass: Mitigation: Speculative Store Bypass disabled via prctl and seccomp
   spectre_v1: Mitigation: Load fences, __user pointer sanitization
   spectre_v2: Mitigation: IBRS (kernel)
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 2x16-GB RDIMM on each memory channel.
 Network:
   Endeavour Omni-Path Fabric consists of 48-port switches = 24 core switches
   connected to each leaf of the rack switch.
 HFI driver parameters:
   cache_size = 1024
   rcvhdrcnt = 4096
 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 40/80/160/320/640 ranks, 2 switches for 1280 and 1980 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

Continued on next page

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`
127.wrf2: `-DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX`
130.socorro: `-assume nostd_intent_in`

Base Optimization Flags

C benchmarks:
`-O3 -xCORE-AVX512 -no-prec-div -ipo`

C++ benchmarks:

126.lammps: `-O3 -xCORE-AVX512 -no-prec-div -ipo`

Fortran benchmarks:
`-O3 -xCORE-AVX512 -no-prec-div -ipo`

Benchmarks using both Fortran and C:
`-O3 -xCORE-AVX512 -no-prec-div -ipo`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20190110.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20190110.xml`

SPEC and SPEC MPI are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC MPI2007 v2.0.1.
Report generated on Thu Jan 10 13:17:52 2019 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 10 January 2019.