



SPEC® MPIM2007 Result

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Intel Corporation

SPECmpiM_peak2007 = Not Run

Intel Server System S9248WK1HLC (Intel Xeon 9242 Platinum, 2.30 GHz, DDR4-2993 MHz, Turbo on)

SPECmpiM_base2007 = 52.0

MPI2007 license: 13

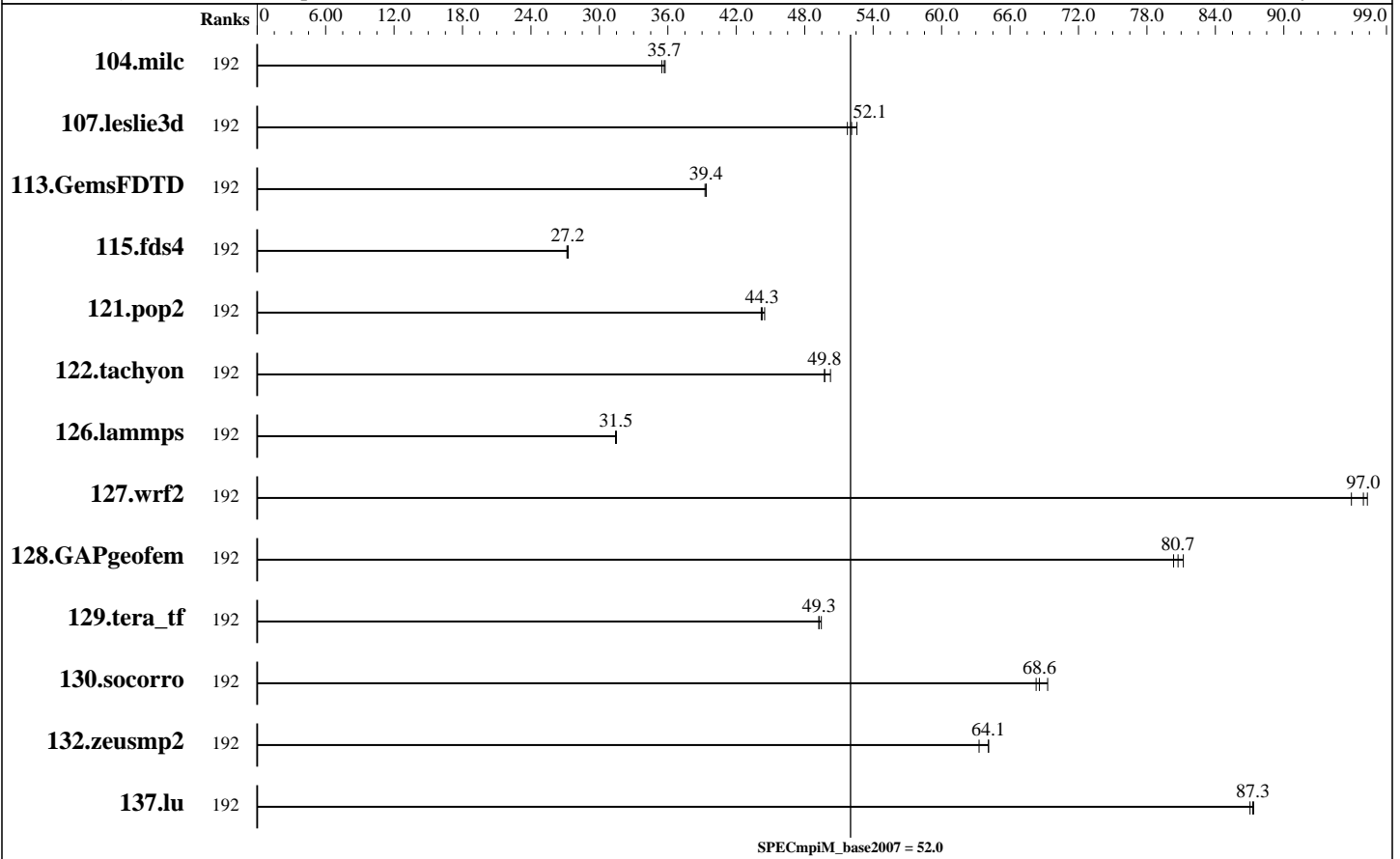
Test date: Jun-2019

Test sponsor: Intel Corporation

Hardware Availability: Jul-2019

Tested by: Intel Corporation

Software Availability: May-2019



Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	192	43.8	35.8	43.9	35.7	44.1	35.5									
107.leslie3d	192	101	51.7	99.3	52.6	100	52.1									
113.GemsFDTD	192	160	39.4	160	39.4	161	39.3									
115.fds4	192	71.8	27.2	71.7	27.2	71.6	27.3									
121.pop2	192	93.4	44.2	92.8	44.5	93.2	44.3									
122.tachyon	192	56.2	49.7	55.7	50.3	56.2	49.8									
126.lammps	192	92.7	31.5	92.8	31.4	92.6	31.5									
127.wrf2	192	80.4	97.0	80.1	97.3	81.3	95.9									
128.GAPgeofem	192	25.6	80.7	25.4	81.2	25.7	80.3									
129.tera_tf	192	56.2	49.2	56.2	49.3	56.0	49.5									

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	192	55.1	69.3	55.9	68.3	55.7	68.6							
132.zeusmp2	192	48.4	64.1	48.4	64.1	49.0	63.3							
137.lu	192	42.1	87.3	42.1	87.4	42.2	87.0							

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 S9248WK1HLC
 Interconnect: Intel Omni-Path 100 series
 File Server Node: Lustre FS 2.10.4
 Total Compute Nodes: 2
 Total Chips: 4
 Total Cores: 192
 Total Threads: 384
 Total Memory: 768 GB
 Base Ranks Run: 192
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C++ Composer XE 2019 Update 3 for Linux
 Version 19.0.3.199 20190206
 C++ Compiler: Intel C++ Composer XE 2019 Update 3 for Linux
 Version 19.0.3.199 20190206
 Fortran Compiler: Intel Fortran Composer 2019 Update 3 for Linux
 Version 19.0.3.199 20190206
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: Intel MPI Library 2018 Update 4 Build 20180823
 Other MPI Info: libfabric-1.7.0
 Pre-processors: No
 Other Software: None

Node Description: Intel Server System S9248WK1HLC

Hardware

Number of nodes: 2
 Uses of the node: Compute
 Vendor: Intel
 Model: Intel Server System S9248WK1HLC
 (2 x Intel Xeon 9242 Platinum,
 Turbo ON)
 CPU Name: Intel Xeon Platinum 9242
 CPU(s) orderable: 1,2 chips
 Chips enabled: 2
 Cores enabled: 96
 Cores per chip: 48
 Threads per core: 2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.8 GHz
 CPU MHz: 2200
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 1 MB I+D on chip per core
 L3 Cache: 71.5 MB I+D on chip per chip,
 35.75 MB shared / 24 cores
 Other Cache: None
 Memory: 384 GB (24 x 16 GB 2Rx8 DDR4-2993Y-R)
 Disk Subsystem: N/A
 Other Hardware: None
 Adapter: Intel Omni-Path Edge Switch 100 series
 Number of Adapters: 2

Software

Adapter: Intel Omni-Path Edge Switch 100 series
 Adapter Driver: IFS 10.9.0.0.210
 Adapter Firmware: 1.27.0
 Operating System: Oracle Linux Server release 7.6
 Local File System: Linux/xfs
 Shared File System: Lustre FS 2.10.4
 System State: Multi-User
 Other Software: IBM Platform LSF Standard 9.1.1.1

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Hardware Availability: Jul-2019

Tested by: Intel Corporation

Software Availability: May-2019

Node Description: Intel Server System S9248WK1HLC

Slot Type:	PCI-Express x16
Data Rate:	2 x 12.5 GB/s
Ports Used:	1
Interconnect Type:	Intel Omni-Path Fabric 100 series

Node Description: Lustre FS 2.10.4

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:	20 MB I+D on chip per chip
Other Cache:	None
Memory:	64 GB per node (8*8GB 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 10.9.0.0.210
Adapter Firmware:	1.27.0
Operating System:	Redhat Enterprise Linux Server Release 7.6
Local File System:	None
Shared File System:	Lustre FS 2.10.4 2.10.4
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:	8
Number of Ports:	48
Data Rate:	2 x 12.5 GB/s
Firmware:	1.27.0
Topology:	Fat tree

Software

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Interconnect Description: Intel Omni-Path 100 series

Primary Use: MPI and I/O traffic

Submit Notes

The config file option 'submit' was used.

Platform Notes

The system used pre-release CPUs running at 2200 MHz instead of the nominal base frequency (2300 MHz).

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 I_MPI_PIN_DOMAIN=core
export I_MPI_PIN_ORDER=bunch
export I_MPI_COMPATIBILITY=3
```

HFI driver parameters:

```
rcvhdrCnt = 4096
```

Spectre and Meltdown:

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Kernel & Microcode:

```
Kernel: 3.10.0-957.12.2.el7.crt1.x86_64
Microcode: 0x4000024
```

BIOS settings:

```
Version: SE5C620.86B.0D.01.0505.050820190224
Intel Hyper-Threading Technology (SMT) = Enabled (default is Enabled)
Intel Turbo Boost Technology (Turbo) = Enabled (default is Enabled)
```

Job placement:

Each MPI job was assigned to a topologically compact set of nodes.
IBM Platform LSF was used for job submission. It has no impact on performance.
Information can be found at: <http://www.ibm.com>



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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-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



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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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