



SPEC® MPIL2007 Result

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Intel Corporation

SPECmpiL_peak2007 = Not Run

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

SPECmpiL_base2007 = 98.1

MPI2007 license: 13

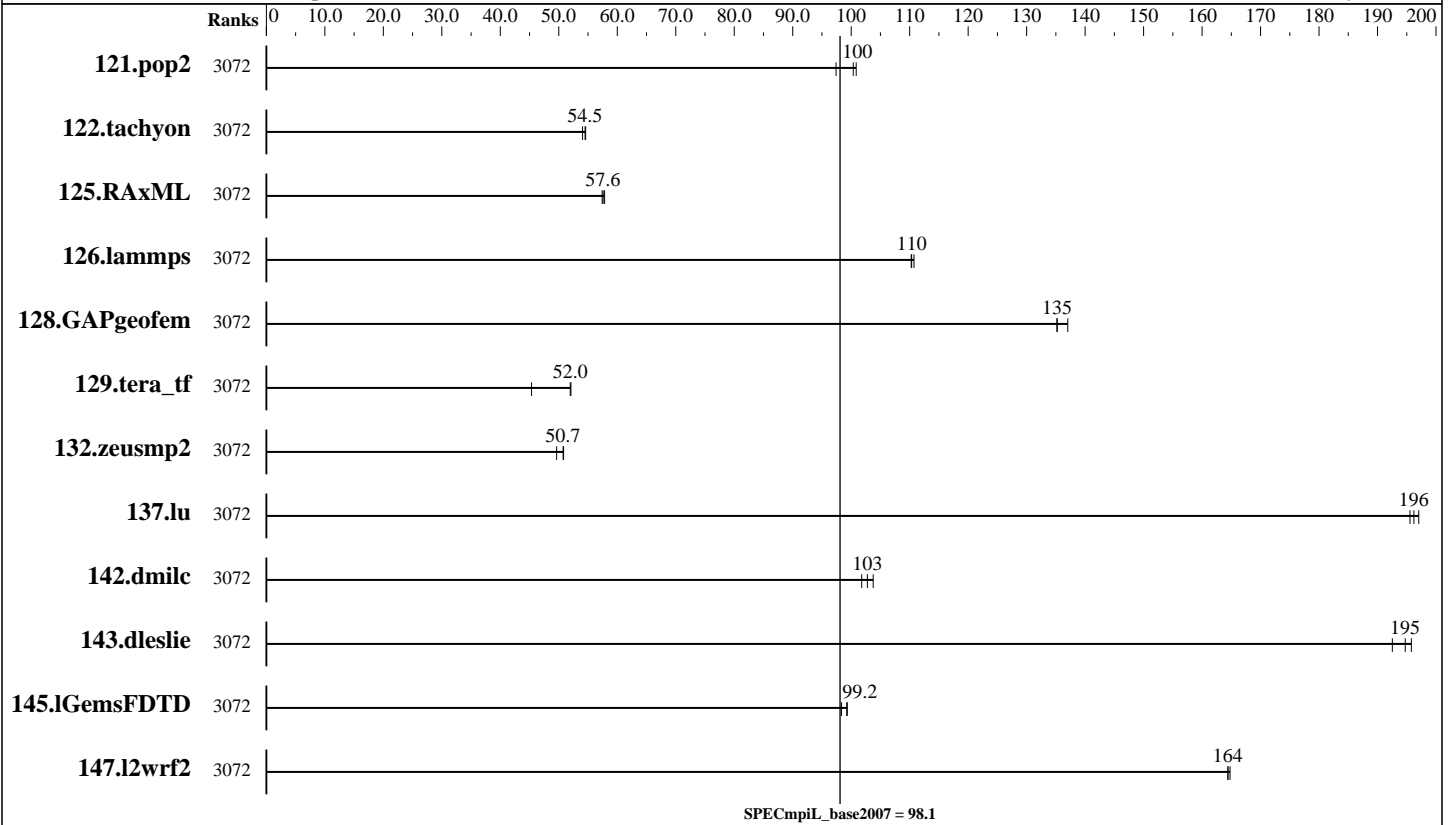
Test date: Jun-2019

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
121.pop2	3072	39.9	97.4	<u>38.8</u>	<u>100</u>	38.6	101							
122.tachyon	3072	<u>35.7</u>	<u>54.5</u>	35.6	54.6	36.0	54.1							
125.RAxML	3072	50.5	57.8	<u>50.7</u>	<u>57.6</u>	50.8	57.4							
126.lammmps	3072	22.3	110	22.2	111	<u>22.3</u>	<u>110</u>							
128.GAPgeofem	3072	<u>43.9</u>	<u>135</u>	43.9	135	43.3	137							
129.tera_tf	3072	<u>21.2</u>	<u>52.0</u>	24.2	45.3	21.1	52.1							
132.zeusmp2	3072	41.7	50.8	<u>41.8</u>	<u>50.7</u>	42.7	49.6							
137.lu	3072	21.3	197	<u>21.4</u>	<u>196</u>	21.5	196							
142.dmilc	3072	36.2	102	<u>35.8</u>	<u>103</u>	35.5	104							
143.dleslie	3072	16.1	193	<u>15.9</u>	<u>195</u>	15.8	196							
145.lGemsFDTD	3072	44.4	99.3	<u>44.4</u>	<u>99.2</u>	44.9	98.3							
147.l2wrf2	3072	49.8	165	49.9	164	<u>49.9</u>	<u>164</u>							

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Standard Performance Evaluation Corporation

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http://www.spec.org/



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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: 32
 Total Chips: 64
 Total Cores: 3072
 Total Threads: 6144
 Total Memory: 12 TB
 Base Ranks Run: 3072
 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: 32
 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
 Slot Type: PCI-Express x16
 Data Rate: 2 x 12.5 GB/s
 Ports Used: 1
 Interconnect Type: Intel Omni-Path Fabric 100 series

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/xf�
 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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Software Availability: May-2019

Node Description: Lustre FS 2.10.4

Hardware		Software	
Number of nodes:	11	Adapter:	Intel Omni-Path Fabric Adapter 100 series
Uses of the node:	Fileserver	Adapter Driver:	IFS 10.9.0.0.210
Vendor:	Intel	Adapter Firmware:	1.27.0
Model:	Intel Server System R2208GZ4GC4	Operating System:	Redhat Enterprise Linux Server Release 7.6
CPU Name:	Intel Xeon E5-2680	Local File System:	None
CPU(s) orderable:	1-2 chips	Shared File System:	Lustre FS 2.10.4 2.10.4
Chips enabled:	2	System State:	Multi-User
Cores enabled:	16	Other Software:	None
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		

Interconnect Description: Intel Omni-Path 100 series

Hardware		Software	
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		
Primary Use:	MPI and I/O traffic		

Submit Notes

The config file option 'submit' was used.



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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
```

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>

Base Compiler Invocation

C benchmarks:

```
mpiicc
```

C++ benchmarks:

```
126.lammps: mpiicpc
```

Fortran benchmarks:

```
mpiifort
```

Benchmarks using both Fortran and C:

```
mpiicc mpiifort
```



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Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG
126.lammps: -DMPICH_IGNORE_CXX_SEEK

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.

Tested with SPEC MPI2007 v2.0.1.
Report generated on Wed Jul 31 16:22:17 2019 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 3 July 2019.