SPEC® MPIL2007 Result

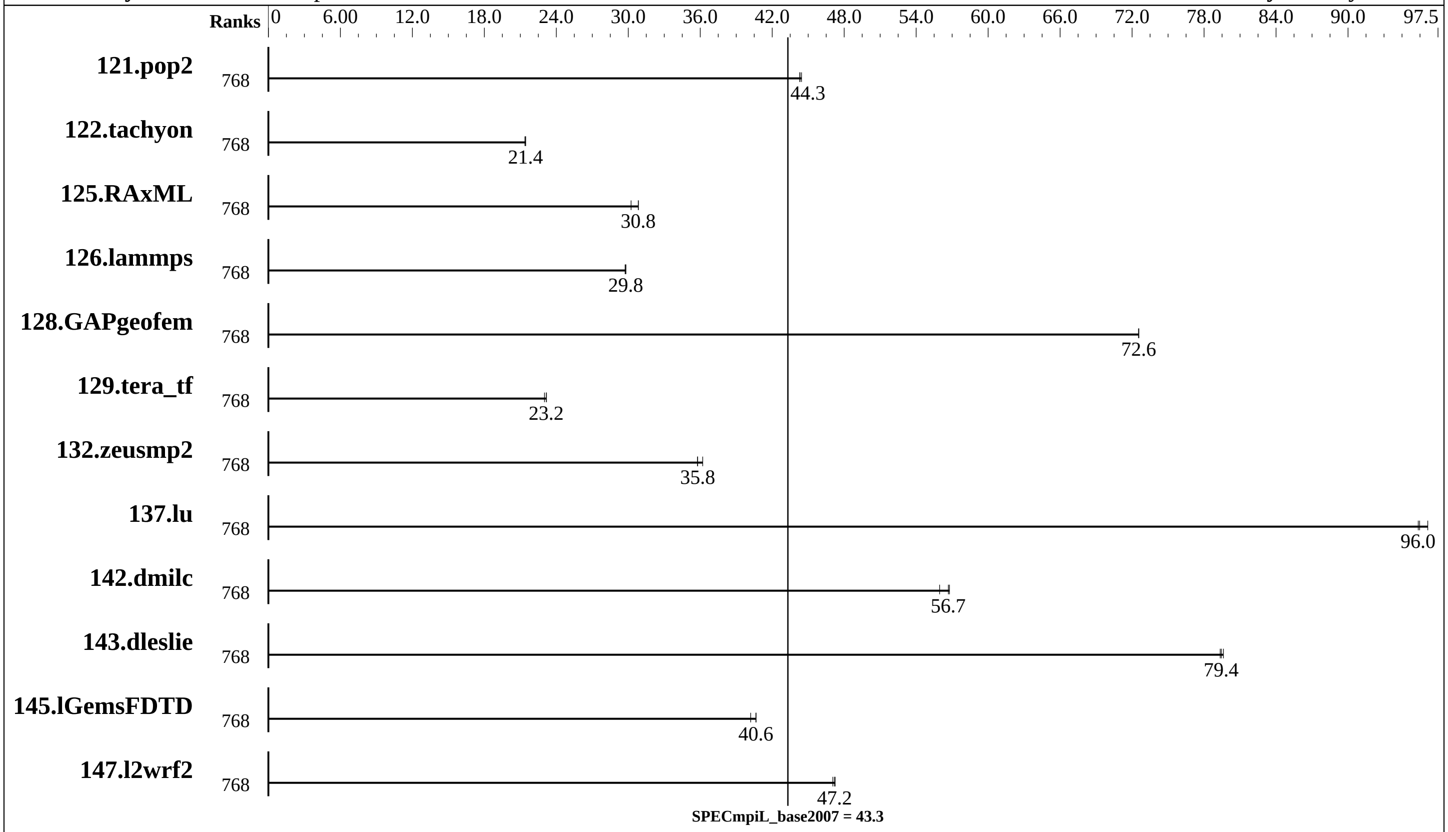
Intel Corporation

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

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 43.3

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	768	87.5	44.4	**87.8**	**44.3**	87.8	44.3							
122.tachyon	768	**90.7**	**21.4**	90.9	21.4	90.6	21.5							
125.RAxML	768	96.5	30.2	**94.7**	**30.8**	94.6	30.8							
126.lammps	768	82.7	29.7	82.5	29.8	**82.5**	**29.8**							
128.GAPgeofem	768	81.8	72.5	81.8	72.6	**81.8**	**72.6**							
129.tera_tf	768	47.4	23.2	**47.4**	**23.2**	47.7	23.0							
132.zeusmp2	768	**59.2**	**35.8**	59.3	35.8	58.6	36.2							
137.lu	768	**43.8**	**96.0**	43.5	96.6	43.8	95.9							
142.dmilc	768	**65.0**	**56.7**	65.8	56.0	64.9	56.8							
143.dleslie	768	39.1	79.3	38.9	79.6	**39.0**	**79.4**							
145.lGemsFDTD	768	110	40.2	**109**	**40.6**	109	40.7							
147.l2wrf2	768	174	47.1	174	47.2	**174**	**47.2**							

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

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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
Total Compute Nodes:	8
Total Chips:	16
Total Cores:	768
Total Threads:	1536
Total Memory:	3 TB
Base Ranks Run:	768
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:	8
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/xfs
Shared File System:	Lustre FS
System State:	Multi-User
Other Software:	IBM Platform LSF Standard 9.1.1.1

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MPI2007 license:	13	**Test date:**	Jun-2019
Test sponsor:	Intel Corporation	**Hardware Availability:**	Jul-2019
Tested by:	Intel Corporation	**Software Availability:**	May-2019

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:	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
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
Primary Use:	MPI and I/O traffic

Software

Submit Notes

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

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Test sponsor: Intel Corporation
Tested by: Intel Corporation
Test date: Jun-2019
Hardware Availability: Jul-2019
Software Availability: May-2019

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`

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

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

Tested with SPEC MPI2007 v2.0.1.
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