



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 = 23.3

MPI2007 license: 13

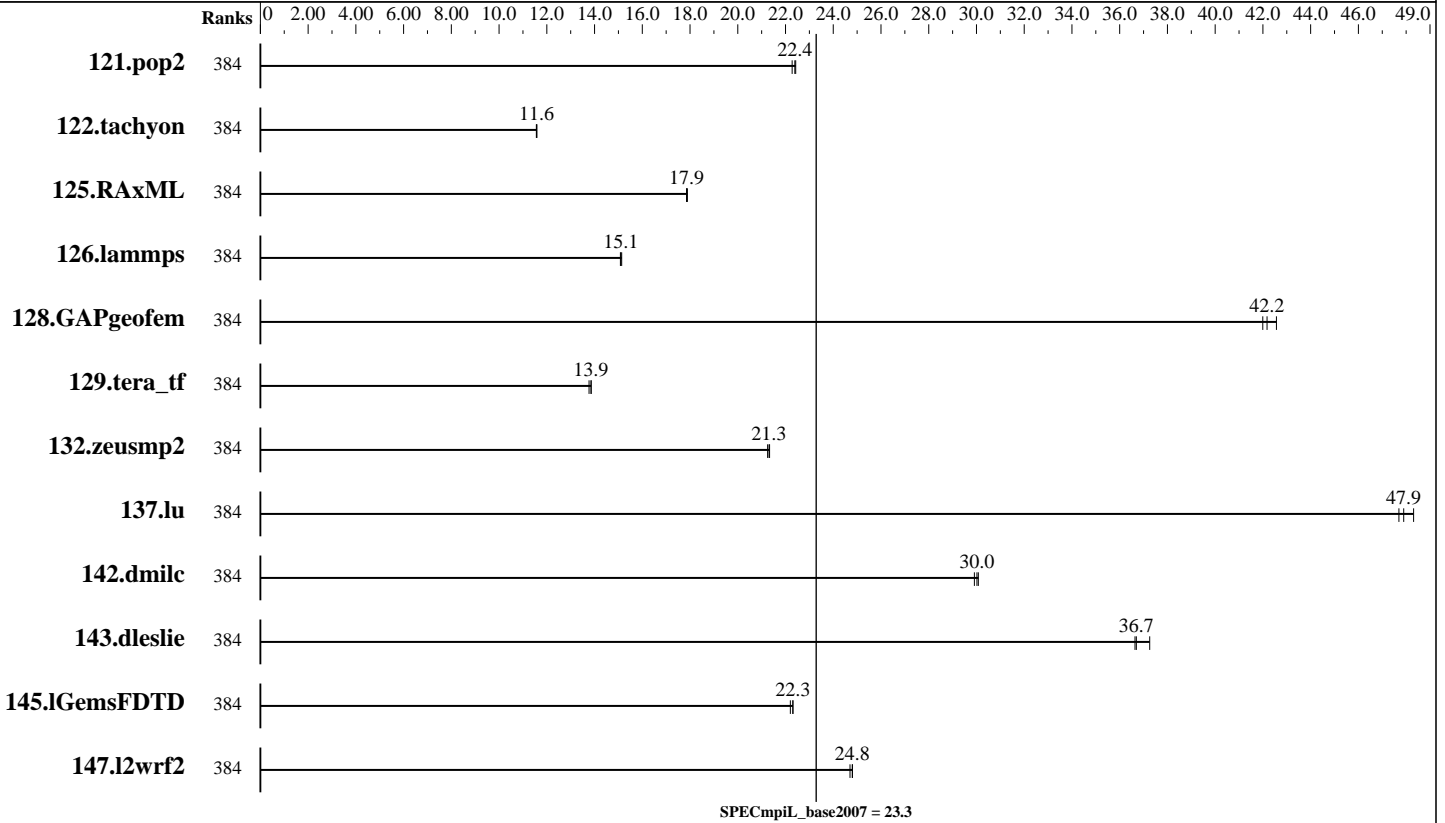
Test date: Jun-2019

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	384	173	22.4	174	22.4	175	22.3							
122.tachyon	384	168	11.6	168	11.6	168	11.6							
125.RAxML	384	163	17.9	163	17.9	163	17.9							
126.lammps	384	162	15.1	163	15.1	163	15.1							
128.GAPgeofem	384	141	42.0	139	42.6	141	42.2							
129.tera_tf	384	79.3	13.9	79.8	13.8	79.3	13.9							
132.zeusmp2	384	99.8	21.2	99.4	21.3	99.5	21.3							
137.lu	384	88.1	47.7	87.0	48.3	87.7	47.9							
142.dmilc	384	123	30.0	122	30.1	123	29.9							
143.dleslie	384	84.6	36.6	83.2	37.3	84.5	36.7							
145.lGemsFDTD	384	199	22.2	198	22.3	198	22.3							
147.l2wrf2	384	332	24.7	331	24.8	331	24.8							

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

Software 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: 4
 Total Chips: 8
 Total Cores: 384
 Total Threads: 768
 Total Memory: 1536 GB
 Base Ranks Run: 384
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

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

Software

Number of nodes: 4
 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

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/xfst
 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 & Meltdown:

```
Kernel: 3.10.0-957.12.2.el7.crt1.x86_64  
Microcode: 0x4000024  
lltf: Not affected  
meltdown: Not affected  
mds: Not affected
```

```
spec_store_bypass: Mitigation: Speculative Store Bypass disabled via prctl and seccomp  
spectre_v1: Mitigation: Load fences, __user pointer sanitization  
spectre_v2: Mitigation: Enhanced IBRS, IBPB
```

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.

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