SPEC® MPIL2007 Result
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Intel Corporation

Intel Server System S9248WK1HLC (Intel Xeon 9242 Platinum, 2.30 GHz, DDR4-2993 MHz, Turbo on)
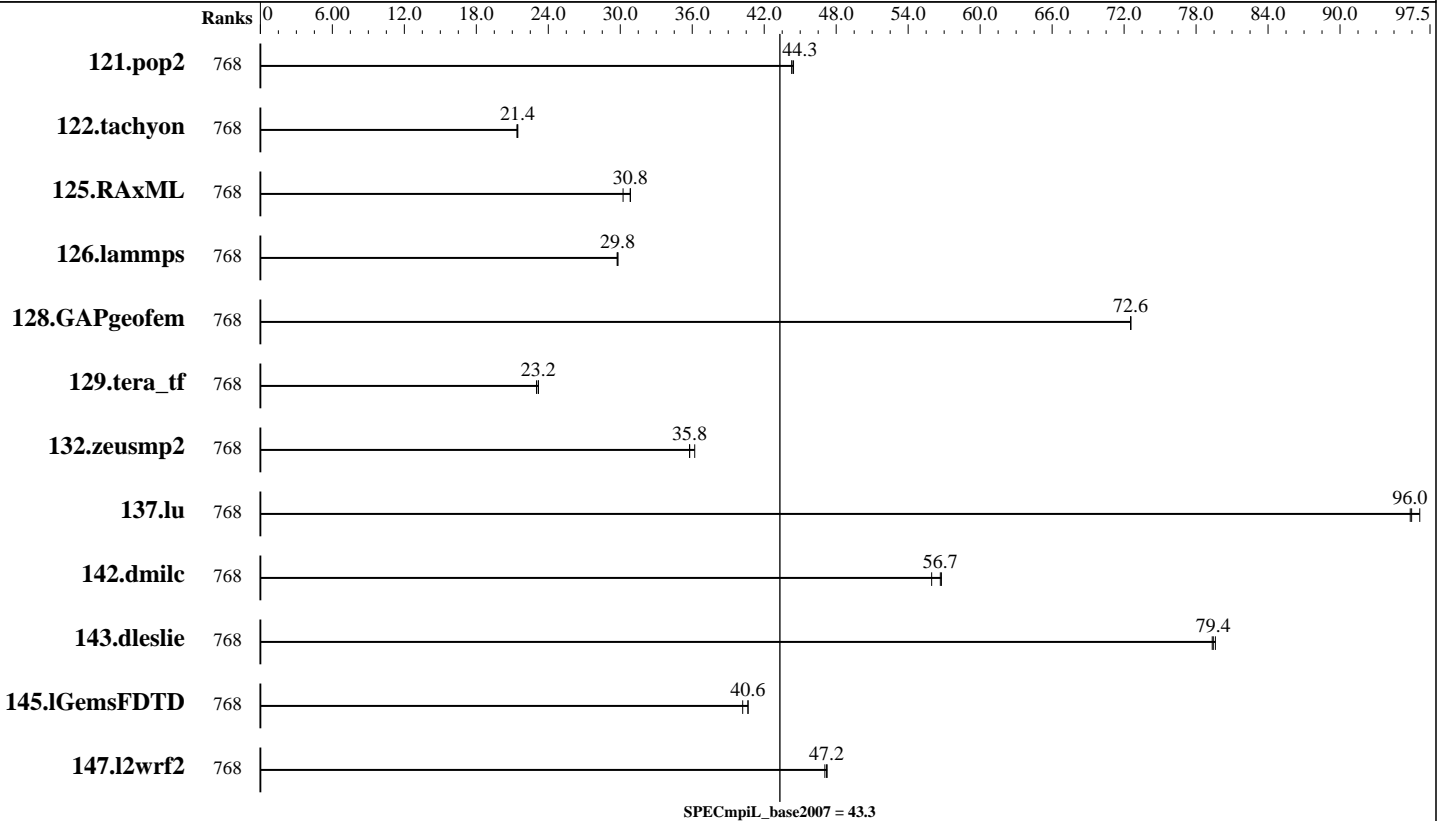
SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 43.3

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

Test date: Jun-2019
Hardware Availability: Jul-2019
Software Availability: May-2019

SPECmpiL_base2007 = 43.3

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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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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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.

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