



SPEC® MPIL2007 Result

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Lenovo Global Technology

ThinkSystem SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

SPECmpiL_peak2007 = 28.1

SPECmpiL_base2007 = 28.1

MPI2007 license: 28

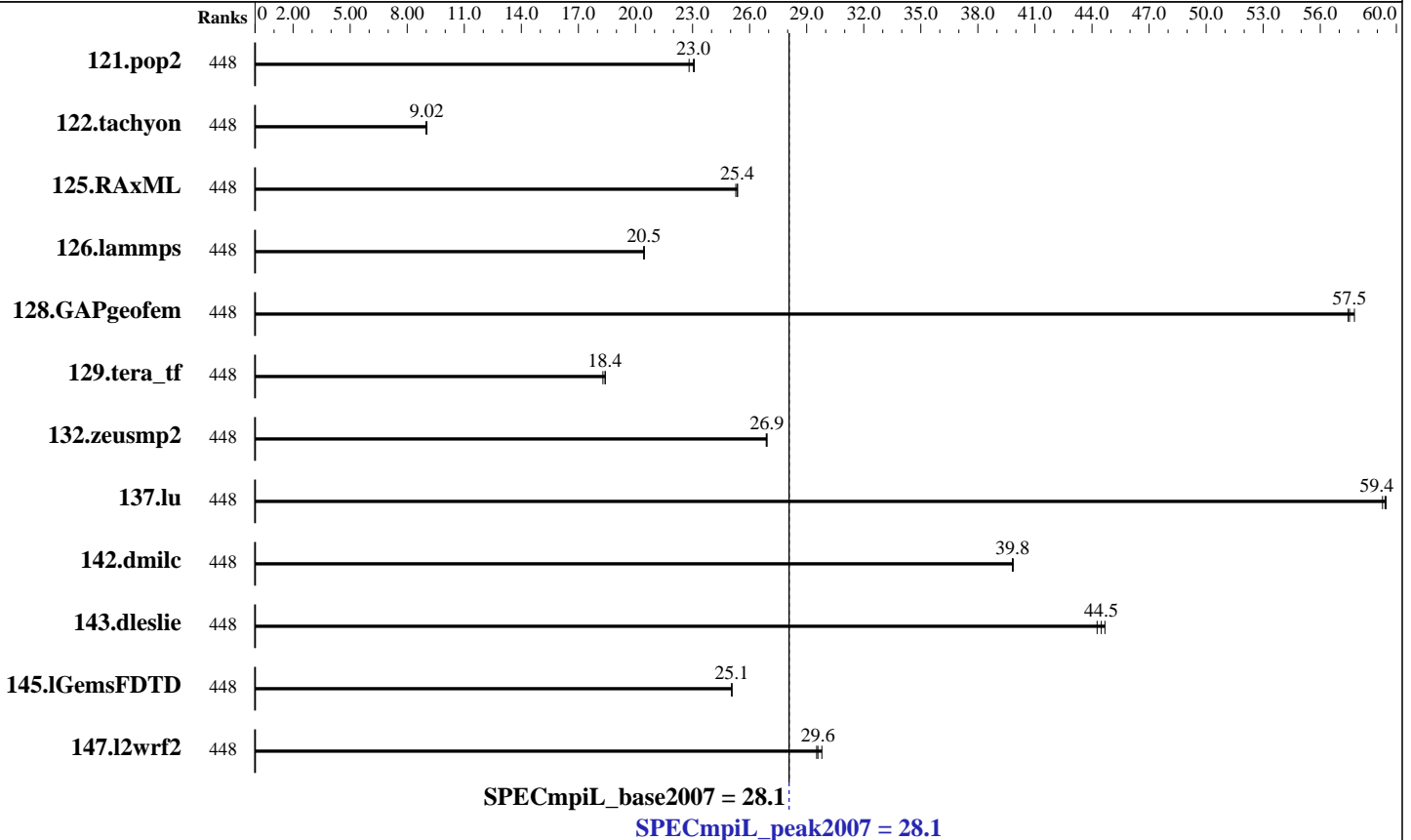
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Oct-2020

Hardware Availability: Oct-2020

Software Availability: Oct-2020



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	448	169	23.1	169	23.0	171	22.8	448	169	23.1	169	23.0	171	22.8
122.tachyon	448	216	9.02	216	8.99	215	9.03	448	216	9.02	216	8.99	215	9.03
125.RAxML	448	115	25.4	115	25.3	115	25.4	448	115	25.4	115	25.3	115	25.4
126.lammps	448	120	20.5	120	20.5	120	20.4	448	120	20.5	120	20.5	120	20.4
128.GAPgeofem	448	103	57.8	103	57.5	103	57.5	448	103	57.8	103	57.5	103	57.5
129.tera_tf	448	59.7	18.4	59.7	18.4	60.1	18.3	448	59.7	18.4	59.7	18.4	60.1	18.3
132.zeusmp2	448	78.8	26.9	78.8	26.9	78.9	26.9	448	78.8	26.9	78.8	26.9	78.9	26.9
137.lu	448	70.7	59.5	70.9	59.3	70.7	59.4	448	70.7	59.5	70.9	59.3	70.7	59.4
142.dmilc	448	92.5	39.8	92.5	39.8	92.4	39.9	448	92.5	39.8	92.5	39.8	92.4	39.9
143.dleslie	448	69.4	44.7	69.7	44.5	70.0	44.3	448	69.4	44.7	69.7	44.5	70.0	44.3
145.lGemsFDTD	448	176	25.1	176	25.1	176	25.1	448	176	25.1	176	25.1	176	25.1
147.l2wrf2	448	278	29.5	277	29.6	275	29.8	448	278	29.5	277	29.6	275	29.8

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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Hardware Summary

Type of System: Homogeneous
 Compute Node: ThinkSystem SR860 V2
 Interconnect: Nvidia Mellanox ConnectX-6 HDR Infiniband
 File Server Node: NFS
 Total Compute Nodes: 4
 Total Chips: 16
 Total Cores: 448
 Total Threads: 448
 Total Memory: 6 TB
 Base Ranks Run: 448
 Minimum Peak Ranks: 448
 Maximum Peak Ranks: 448

Software Summary

C Compiler: Intel Parallel Studio C Compiler 20 Update 2 for Linux
 Version 19.1.2.254 Build 20200623
 C++ Compiler: Intel Parallel Studio C++ Compiler 20 Update 2 for Linux
 Version 19.1.2.254 Build 20200623
 Fortran Compiler: Intel Parallel Studio Fortran Compiler 20 Update 2 for Linux
 Version 19.1.2.254 Build 20200623
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 MPI Library: Intel Parallel Studio MPI Library for Linux* OS
 Version 2020 Update 2 Build 20200624
 Other MPI Info: None
 Pre-processors: No
 Other Software: None

Node Description: ThinkSystem SR860 V2

Hardware

Number of nodes: 4
 Uses of the node: compute
 Vendor: Lenovo Global Technology
 Model: ThinkSystem SR860 V2
 CPU Name: Intel Xeon Platinum 8380H
 CPU(s) orderable: 2,4 chips
 Chips enabled: 4
 Cores enabled: 112
 Cores per chip: 28
 Threads per core: 1
 CPU Characteristics: Intel Turbo Boost Technology up to 4.3 GHz
 CPU MHz: 2900
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 1 MB I+D on chip per core
 L3 Cache: 39424 KB I+D on chip per chip
 Other Cache: None
 Memory: 1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)
 Disk Subsystem: 1 x 1 TB SATA 2.5" SSD
 Other Hardware: N/A
 Adapter: Nvidia Mellanox ConnectX-6 HDR Infiniband
 Number of Adapters: 1
 Slot Type: PCI-Express 3.0 x16
 Data Rate: 200 Gb/s
 Ports Used: 1
 Interconnect Type: Nvidia Mellanox ConnectX-6 HDR Infiniband

Software

Adapter: Nvidia Mellanox ConnectX-6 HDR Infiniband
 Adapter Driver: 5.1-0.6.6
 Adapter Firmware: 20.25.2006
 Operating System: SUSE Linux Enterprise Server 15 SP2
 5.3.18-22-default
 Local File System: xfs
 Shared File System: None
 System State: Multi-user, run level 3
 Other Software: None



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Software Availability: Oct-2020

Node Description: NFS

Hardware		Software	
Number of nodes:	1	Adapter:	Nvidia Mellanox ConnectX-6 HDR Infiniband
Uses of the node:	Fileserver	Adapter Driver:	5.1-0.6.6
Vendor:	Lenovo Global Technology	Adapter Firmware:	20.25.2006
Model:	ThinkSystem SR860 V2	Operating System:	SUSE Linux Enterprise Server 15 SP2
CPU Name:	Intel Xeon Platinum 8380H	Local File System:	None
CPU(s) orderable:	2,4 chips	Shared File System:	NFS
Chips enabled:	4	System State:	Multi-User, run level 3
Cores enabled:	112	Other Software:	None
Cores per chip:	28		
Threads per core:	1		
CPU Characteristics:	Intel Turbo Boost Technology up to 4.3 GHz		
CPU MHz:	2900		
Primary Cache:	32 KB I + 32 KB D on chip per core		
Secondary Cache:	1 MB I+D on chip per core		
L3 Cache:	39424 KB I+D on chip per chip		
Other Cache:	None		
Memory:	1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)		
Disk Subsystem:	1 x 1 TB SATA 2.5" SSD		
Other Hardware:	None		
Adapter:	Nvidia Mellanox ConnectX-6 HDR Infiniband		
Number of Adapters:	1		
Slot Type:	PCI-Express 3.0 x16		
Data Rate:	200 Gb/s		
Ports Used:	1		
Interconnect Type:	Nvidia Mellanox ConnectX-6 HDR Infiniband		

Interconnect Description: Nvidia Mellanox ConnectX-6 HDR Infiniband

Hardware		Software	
Vendor:	Nvidia		
Model:	Nvidia Mellanox ConnectX-6 HDR Infiniband		
Switch Model:	Nvidia Mellanox QM8700		
Number of Switches:	1		
Number of Ports:	40		
Data Rate:	200 Gb/s		
Firmware:	3.9.0606		
Topology:	Mesh		
Primary Use:	MPI and I/O traffic		

Submit Notes

The config file option 'submit' was used.



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General Notes

MPI startup command:

`mpiexec` command was used to start MPI jobs.

RAM configuration:

Compute nodes have 2 x 32 GB RDIMM on each memory channel.

BIOS settings:

Operating Mode : Maximum Performance Mode
Intel Hyper-Threading Technology (SMT): Disabled
SNC (Sub-NUMA Cluster): Enable

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.

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 -ipo -xCORE-AVX512 -no-prec-div`

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Base Optimization Flags (Continued)

C++ benchmarks:

126.lammps: -O3 -ipo -xCORE-AVX512 -no-prec-div

Fortran benchmarks:

-O3 -ipo -xCORE-AVX512 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -ipo -xCORE-AVX512 -no-prec-div

Peak Optimization Flags

C benchmarks:

122.tachyon: basepeak = yes

125.RAxML: basepeak = yes

142.dmilc: basepeak = yes

C++ benchmarks:

126.lammps: basepeak = yes

Fortran benchmarks:

129.tera_tf: basepeak = yes

137.lu: basepeak = yes

143.dleslie: basepeak = yes

145.lGemsFDTD: basepeak = yes

Benchmarks using both Fortran and C:

121.pop2: basepeak = yes

128.GAPgeofem: basepeak = yes

132.zeusmp2: basepeak = yes

147.l2wrf2: basepeak = yes

The flags files that were used to format this result can be browsed at

http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20201007.html

http://www.spec.org/mpi2007/flags/Lenovo-SPECmpiM_Platform_Flags.html



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You can also download the XML flags sources by saving the following links:

http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20201007.xml
http://www.spec.org/mpi2007/flags/Lenovo-SPECmpiM_Platform_Flags.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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