



SPEC® MPIM2007 Result

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Lenovo Global Technology

SPECmpim_peak2007 = 101

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

SPECmpim_base2007 = 99.3

MPI2007 license: 28

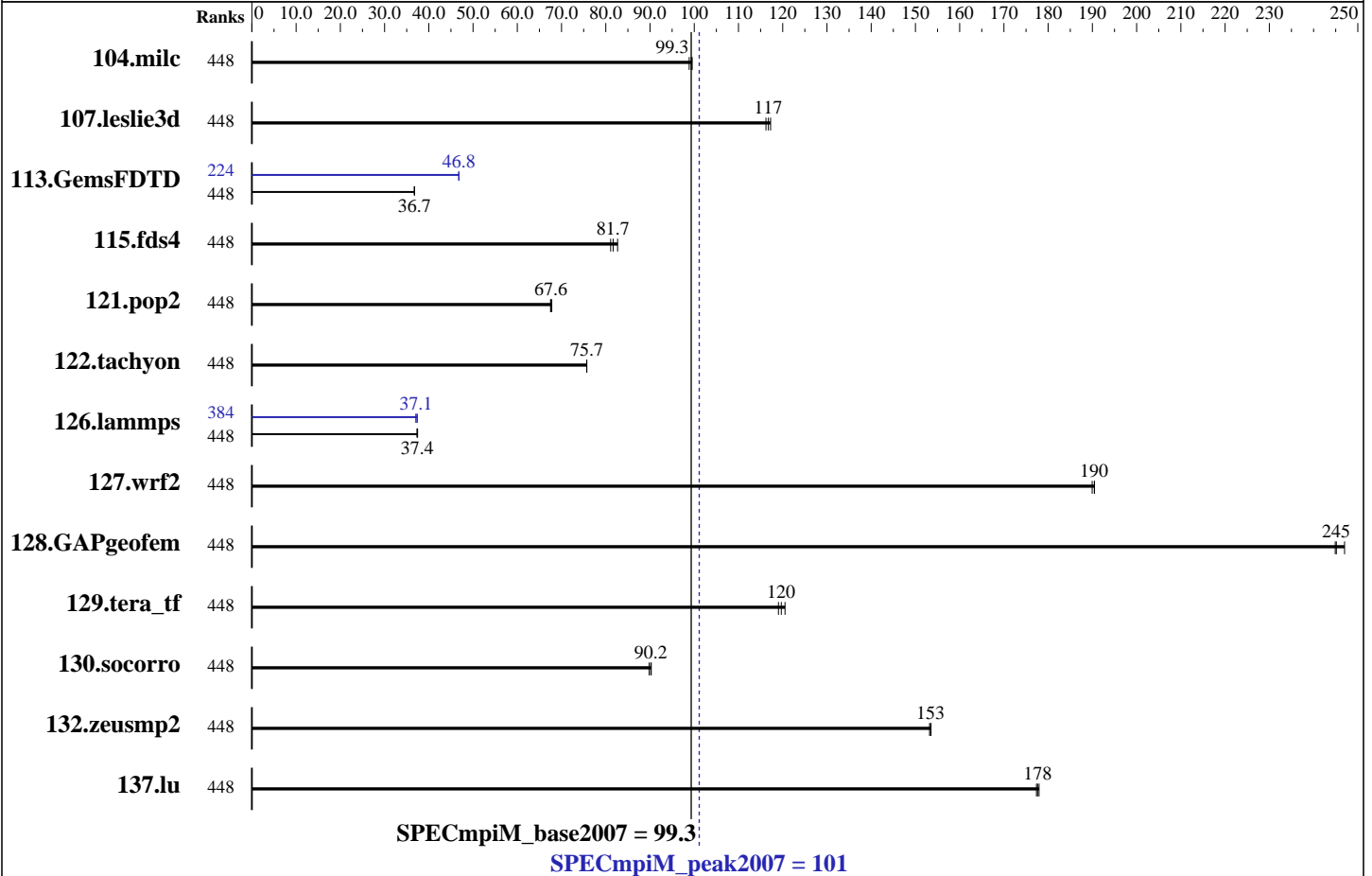
Test date: Oct-2020

Test sponsor: Lenovo Global Technology

Hardware Availability: Oct-2020

Tested by: Lenovo Global Technology

Software Availability: Oct-2020



Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	448	15.8	98.9	<u>15.8</u>	<u>99.3</u>	15.7	99.5	448	15.8	98.9	<u>15.8</u>	<u>99.3</u>	15.7	99.5		
107.leslie3d	448	44.9	116	<u>44.7</u>	<u>117</u>	44.5	117	448	44.9	116	<u>44.7</u>	<u>117</u>	44.5	117		
113.GemsFDTD	448	172	36.8	172	36.7	<u>172</u>	<u>36.7</u>	224	135	46.8	<u>135</u>	<u>46.8</u>	135	46.8		
115.fds4	448	<u>23.9</u>	<u>81.7</u>	24.1	81.1	23.6	82.7	448	<u>23.9</u>	<u>81.7</u>	24.1	81.1	23.6	82.7		
121.pop2	448	60.9	67.8	<u>61.1</u>	<u>67.6</u>	61.1	67.5	448	60.9	67.8	<u>61.1</u>	<u>67.6</u>	61.1	67.5		
122.tachyon	448	37.0	75.7	<u>37.0</u>	<u>75.7</u>	36.9	75.7	448	37.0	75.7	<u>37.0</u>	<u>75.7</u>	36.9	75.7		
126.lammps	448	<u>78.0</u>	<u>37.4</u>	78.1	37.3	77.8	37.5	384	<u>78.5</u>	<u>37.1</u>	78.6	37.1	77.9	37.4		
127.wrf2	448	41.0	190	40.9	190	<u>40.9</u>	<u>190</u>	448	41.0	190	40.9	190	<u>40.9</u>	<u>190</u>		
128.GAPgeofem	448	8.43	245	8.36	247	<u>8.42</u>	<u>245</u>	448	8.43	245	8.36	247	<u>8.42</u>	<u>245</u>		
129.tera_tf	448	23.3	119	<u>23.1</u>	<u>120</u>	23.0	121	448	23.3	119	<u>23.1</u>	<u>120</u>	23.0	121		

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



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Results Table (Continued)

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
130.socorro	448	42.3	90.3	42.5	89.8	42.3	90.2	448	42.3	90.3	42.5	89.8	42.3	90.2		
132.zeusmp2	448	20.2	154	20.3	153	20.2	153	448	20.2	154	20.3	153	20.2	153		
137.lu	448	20.7	177	20.7	178	20.7	178	448	20.7	177	20.7	178	20.7	178		

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

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: 224
 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

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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Node Description: ThinkSystem SR860 V2

Slot Type:	PCI-Express 3.0 x16
Data Rate:	200 Gb/s
Ports Used:	1
Interconnect Type:	Nvidia Mellanox ConnectX-6 HDR Infiniband

Node Description: NFS

Hardware

Software

Number of nodes:	1
Uses of the node:	Fileserver
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:	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

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
Local File System:	None
Shared File System:	NFS
System State:	Multi-User, run level 3
Other Software:	None

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

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Interconnect Description: Nvidia Mellanox ConnectX-6 HDR Infiniband

Primary Use: MPI and I/O traffic

Submit Notes

The config file option 'submit' was used.

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.

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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Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG
126.lammps: -DMPICH_IGNORE_CXX_SEEK
127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX
130.socorro: -assume nostd_intent_in

Base Optimization Flags

C benchmarks:

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

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:

104.milc: basepeak = yes

122.tachyon: basepeak = yes

C++ benchmarks:

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

Fortran benchmarks:

107.leslie3d: basepeak = yes

113.GemsFDTD: -O3 -ipo -xCORE-AVX512 -no-prec-div

129.tera_tf: basepeak = yes

137.lu: basepeak = yes

Benchmarks using both Fortran and C:

115.fds4: basepeak = yes

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Peak Optimization Flags (Continued)

121.pop2: basepeak = yes

127.wrf2: basepeak = yes

128.GAPgeofem: basepeak = yes

130.socorro: basepeak = yes

132.zeusmp2: 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

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.

Tested with SPEC MPI2007 v2.0.1.

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