SPEC® MPIM2007 Result

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Lenovo Global Technology

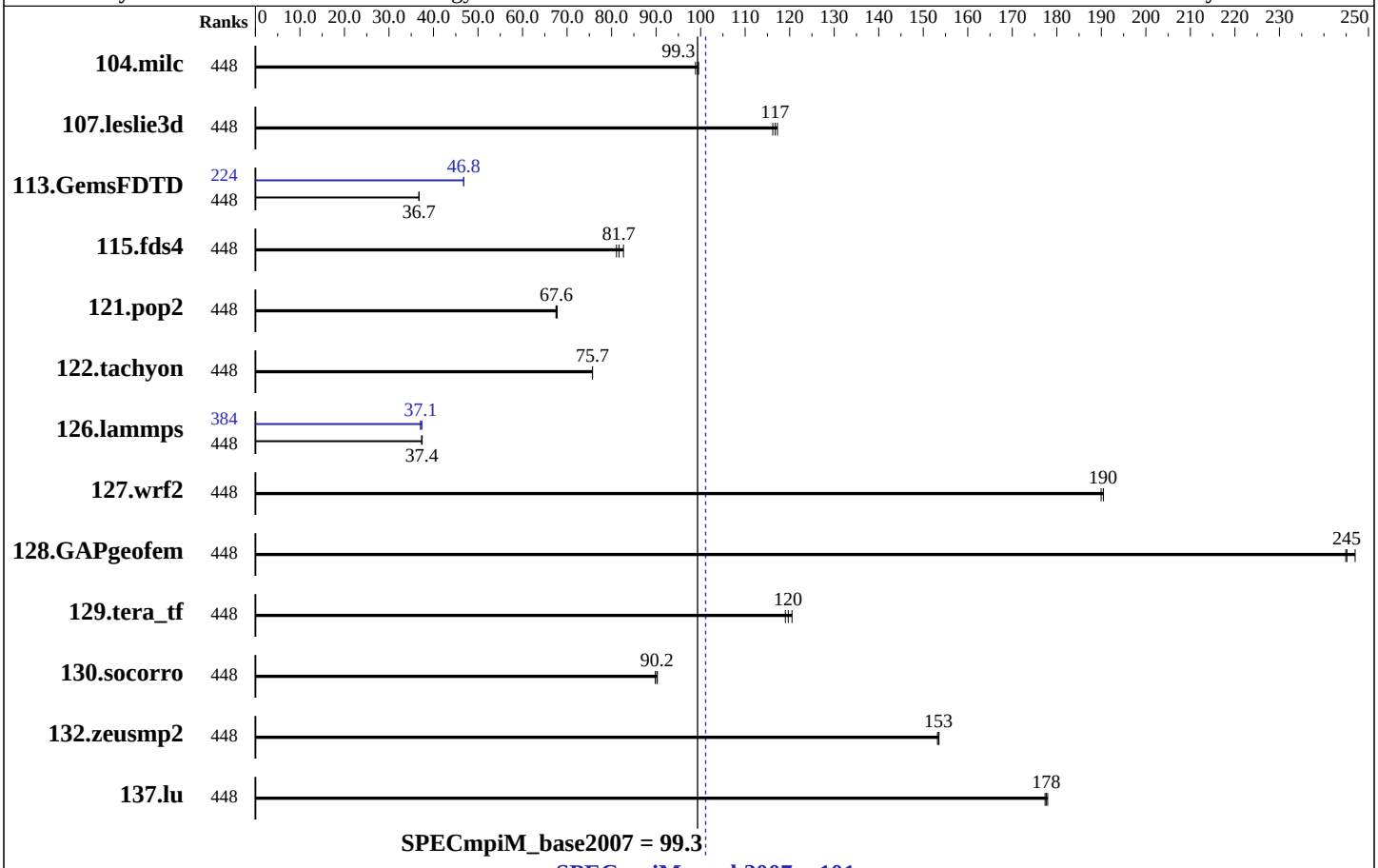
ThinkSystem SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

SPECmpiM_peak2007 = 101

SPECmpiM_base2007 = 99.3

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
104.milc	448	15.8	98.9	**15.8**	**99.3**	15.7	99.5	448	15.8	98.9	**15.8**	**99.3**	15.7	99.5
107.leslie3d	448	44.9	116	**44.7**	**117**	44.5	117	448	44.9	116	**44.7**	**117**	44.5	117
113.GemsFDTD	448	172	36.8	172	36.7	**172**	**36.7**	224	135	46.8	**135**	**46.8**	135	46.8
115.fds4	448	**23.9**	**81.7**	24.1	81.1	23.6	82.7	448	**23.9**	**81.7**	24.1	81.1	23.6	82.7
121.pop2	448	60.9	67.8	**61.1**	**67.6**	61.1	67.5	448	60.9	67.8	**61.1**	**67.6**	61.1	67.5
122.tachyon	448	37.0	75.7	**37.0**	**75.7**	36.9	75.7	448	37.0	75.7	**37.0**	**75.7**	36.9	75.7
126.lammps	448	**78.0**	**37.4**	78.1	37.3	77.8	37.5	384	**78.5**	**37.1**	78.6	37.1	77.9	37.4
127.wrf2	448	41.0	190	40.9	190	**40.9**	**190**	448	41.0	190	40.9	190	**40.9**	**190**
128.GAPgeofem	448	8.43	245	8.36	247	**8.42**	**245**	448	8.43	245	8.36	247	**8.42**	**245**
129.tera_tf	448	23.3	119	**23.1**	**120**	23.0	121	448	23.3	119	**23.1**	**120**	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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Hardware Availability: Oct-2020
Software Availability: Oct-2020

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

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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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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

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

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

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
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

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

Software

Continued on next page

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`

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.

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