SPEC® MPIM2007 Result

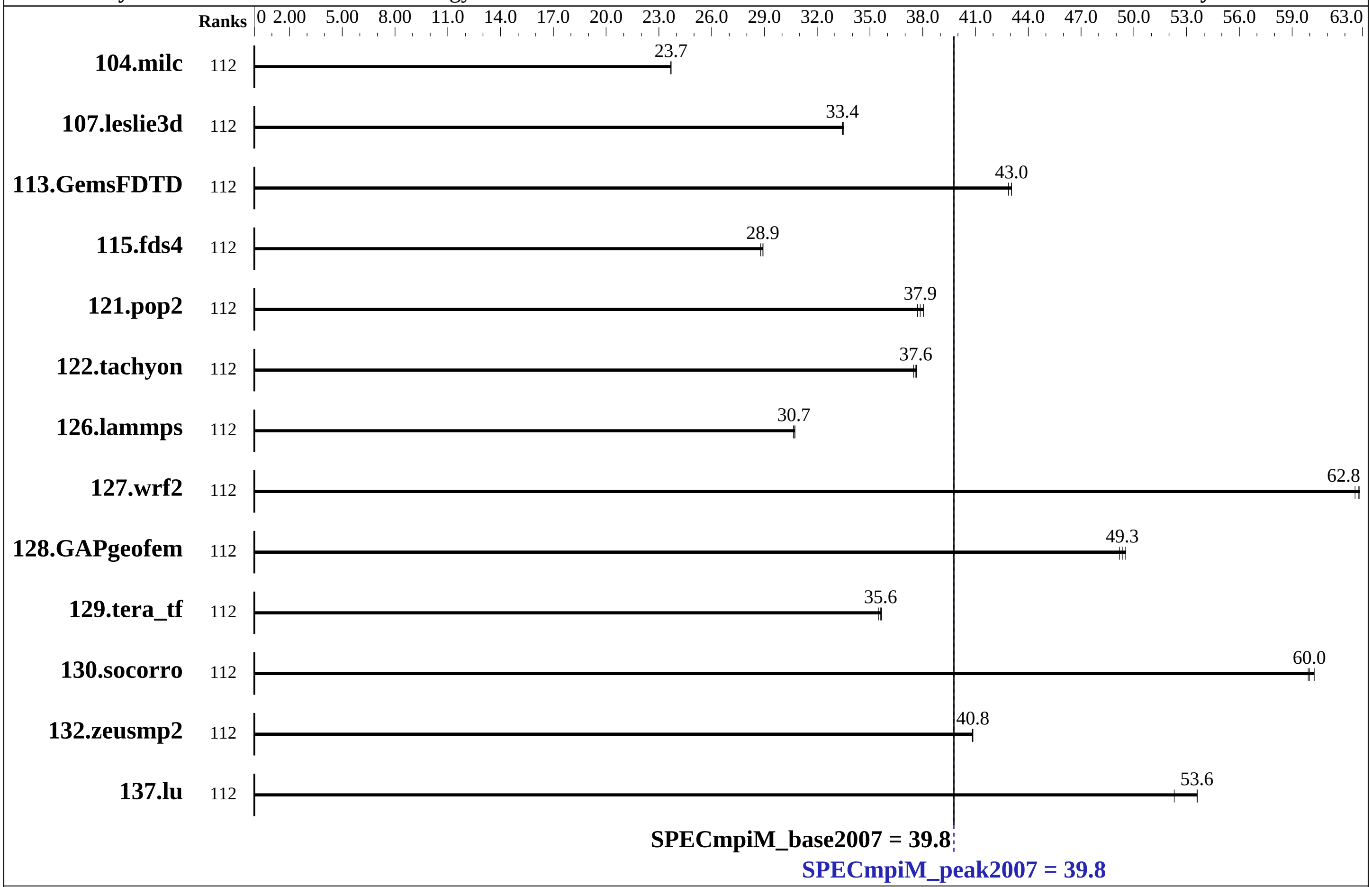
Lenovo Global Technology

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

SPECmpiM_peak2007 = 39.8

SPECmpiM_base2007 = 39.8

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	112	**66.1**	**23.7**	66.0	23.7	66.1	23.7	112	**66.1**	**23.7**	66.0	23.7	66.1	23.7
107.leslie3d	112	156	33.4	156	33.5	**156**	**33.4**	112	156	33.4	156	33.5	**156**	**33.4**
113.GemsFDTD	112	**147**	**43.0**	147	42.9	147	43.1	112	**147**	**43.0**	147	42.9	147	43.1
115.fds4	112	**67.5**	**28.9**	67.5	28.9	67.8	28.8	112	**67.5**	**28.9**	67.5	28.9	67.8	28.8
121.pop2	112	109	37.7	**109**	**37.9**	108	38.0	112	109	37.7	**109**	**37.9**	108	38.0
122.tachyon	112	74.3	37.6	74.6	37.5	**74.4**	**37.6**	112	74.3	37.6	74.6	37.5	**74.4**	**37.6**
126.lammps	112	94.8	30.7	**95.0**	**30.7**	95.1	30.7	112	94.8	30.7	**95.0**	**30.7**	95.1	30.7
127.wrf2	112	**124**	**62.8**	125	62.6	124	62.8	112	**124**	**62.8**	125	62.6	124	62.8
128.GAPgeofem	112	42.0	49.2	41.7	49.5	**41.8**	**49.3**	112	42.0	49.2	41.7	49.5	**41.8**	**49.3**
129.tera_tf	112	77.6	35.7	**77.7**	**35.6**	78.0	35.5	112	77.6	35.7	**77.7**	**35.6**	78.0	35.5

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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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	112	63.7	59.9	**63.6**	**60.0**	63.3	60.3	112	63.7	59.9	**63.6**	**60.0**	63.3	60.3
132.zeusmp2	112	76.0	40.8	76.0	40.9	**76.0**	**40.8**	112	76.0	40.8	76.0	40.9	**76.0**	**40.8**
137.lu	112	68.6	53.6	70.3	52.3	**68.6**	**53.6**	112	68.6	53.6	70.3	52.3	**68.6**	**53.6**

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:	1
Total Chips:	4
Total Cores:	112
Total Threads:	112
Total Memory:	1536 GB
Base Ranks Run:	112
Minimum Peak Ranks:	112
Maximum Peak Ranks:	112

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:	1
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 Nvidia Mellanox ConnectX-6 HDR Infiniband
Number of Adapters:	1

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Software

Adapter:	Nvidia 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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Test sponsor:	Lenovo Global Technology	**Hardware Availability:**	Oct-2020
Tested by:	Lenovo Global Technology	**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 Series
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

Software

Adapter:	Nvidia Mellanox ConnectX-6 Series
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

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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.
```

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`
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: `basepeak = yes`

Fortran benchmarks:

107.leslie3d: `basepeak = yes`

113.GemsFDTD: `basepeak = yes`

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

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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