SPEC® MPIM2007 Result

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Lenovo Global Technology

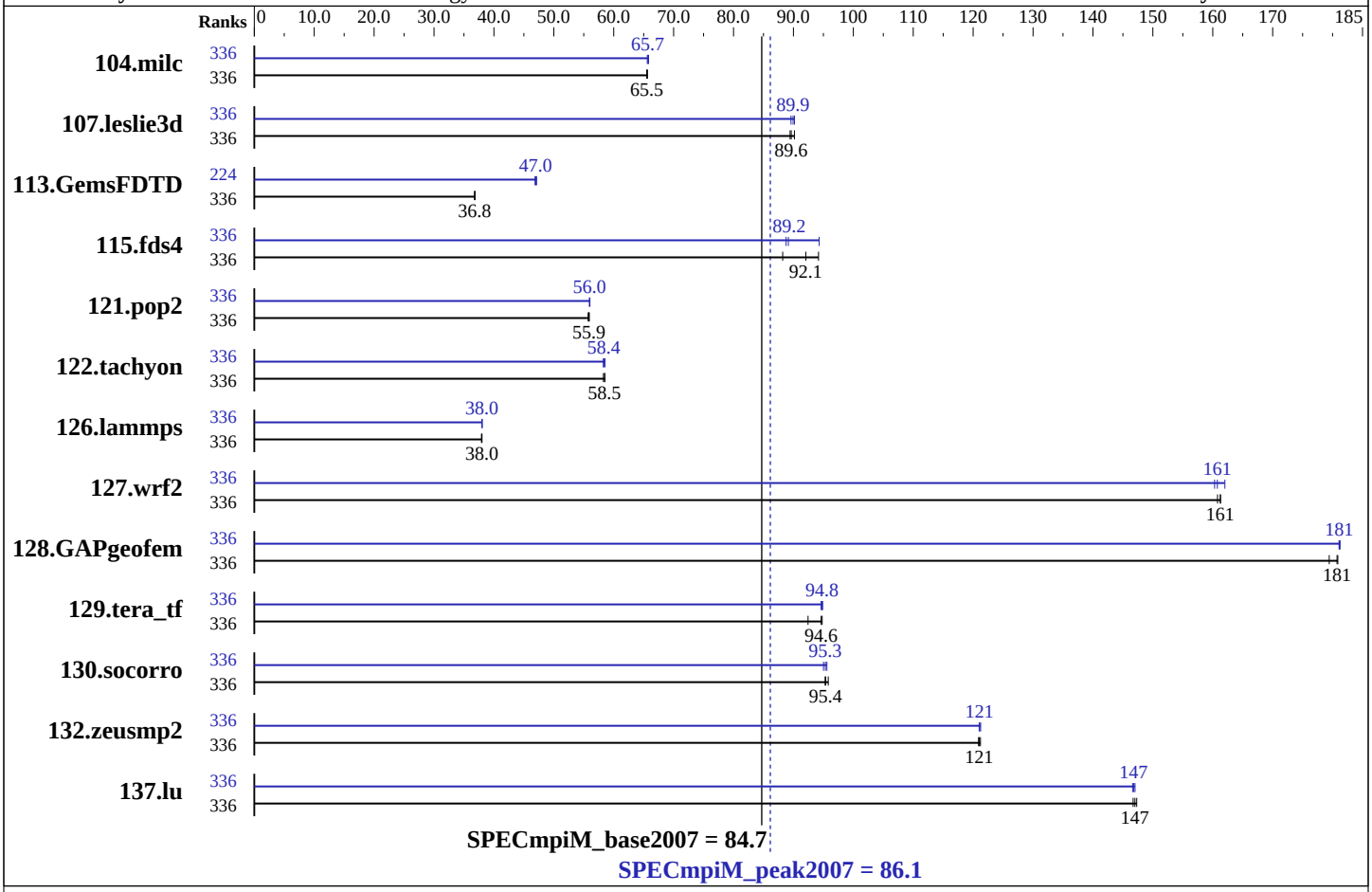
ThinkSystem SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

SPECmpiM_peak2007 = 86.1

SPECmpiM_base2007 = 84.7

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	336	23.9	65.5	23.8	65.6	**23.9**	**65.5**	336	**23.8**	**65.7**	23.8	65.8	23.9	65.6
107.leslie3d	336	57.9	90.2	**58.2**	**89.6**	58.4	89.4	336	58.3	89.6	57.9	90.2	**58.0**	**89.9**
113.GemsFDTD	336	172	36.8	171	36.8	**171**	**36.8**	224	135	46.9	134	47.1	**134**	**47.0**
115.fds4	336	22.1	88.2	20.7	94.2	**21.2**	**92.1**	336	22.0	88.8	**21.9**	**89.2**	20.7	94.3
121.pop2	336	73.8	55.9	74.1	55.7	**73.9**	**55.9**	336	73.7	56.0	**73.8**	**56.0**	73.8	56.0
122.tachyon	336	47.8	58.5	48.0	58.3	**47.8**	**58.5**	336	47.8	58.6	**47.9**	**58.4**	48.0	58.3
126.lammps	336	76.9	37.9	76.7	38.0	**76.7**	**38.0**	336	**76.7**	**38.0**	76.7	38.0	76.7	38.0
127.wrf2	336	48.5	161	48.3	161	**48.3**	**161**	336	48.6	160	48.1	162	**48.5**	**161**
128.GAPgeofem	336	**11.4**	**181**	11.4	181	11.5	179	336	11.4	181	**11.4**	**181**	11.4	181
129.tera_tf	336	29.2	94.8	29.9	92.4	**29.3**	**94.6**	336	29.2	94.9	**29.2**	**94.8**	29.3	94.6

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	336	39.8	95.8	**40.0**	**95.4**	40.1	95.3	336	40.2	95.0	39.9	95.6	**40.0**	**95.3**
132.zeusmp2	336	25.7	121	**25.6**	**121**	25.6	121	336	25.6	121	**25.6**	**121**	25.6	121
137.lu	336	25.1	147	**25.0**	**147**	25.0	147	336	25.0	147	25.1	147	**25.0**	**147**

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:	3
Total Chips:	12
Total Cores:	336
Total Threads:	336
Total Memory:	4608 GB
Base Ranks Run:	336
Minimum Peak Ranks:	224
Maximum Peak Ranks:	336

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:	3
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

Continued on next page

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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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`

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`

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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