SPEC® MPIM2007 Result

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Lenovo Global Technology

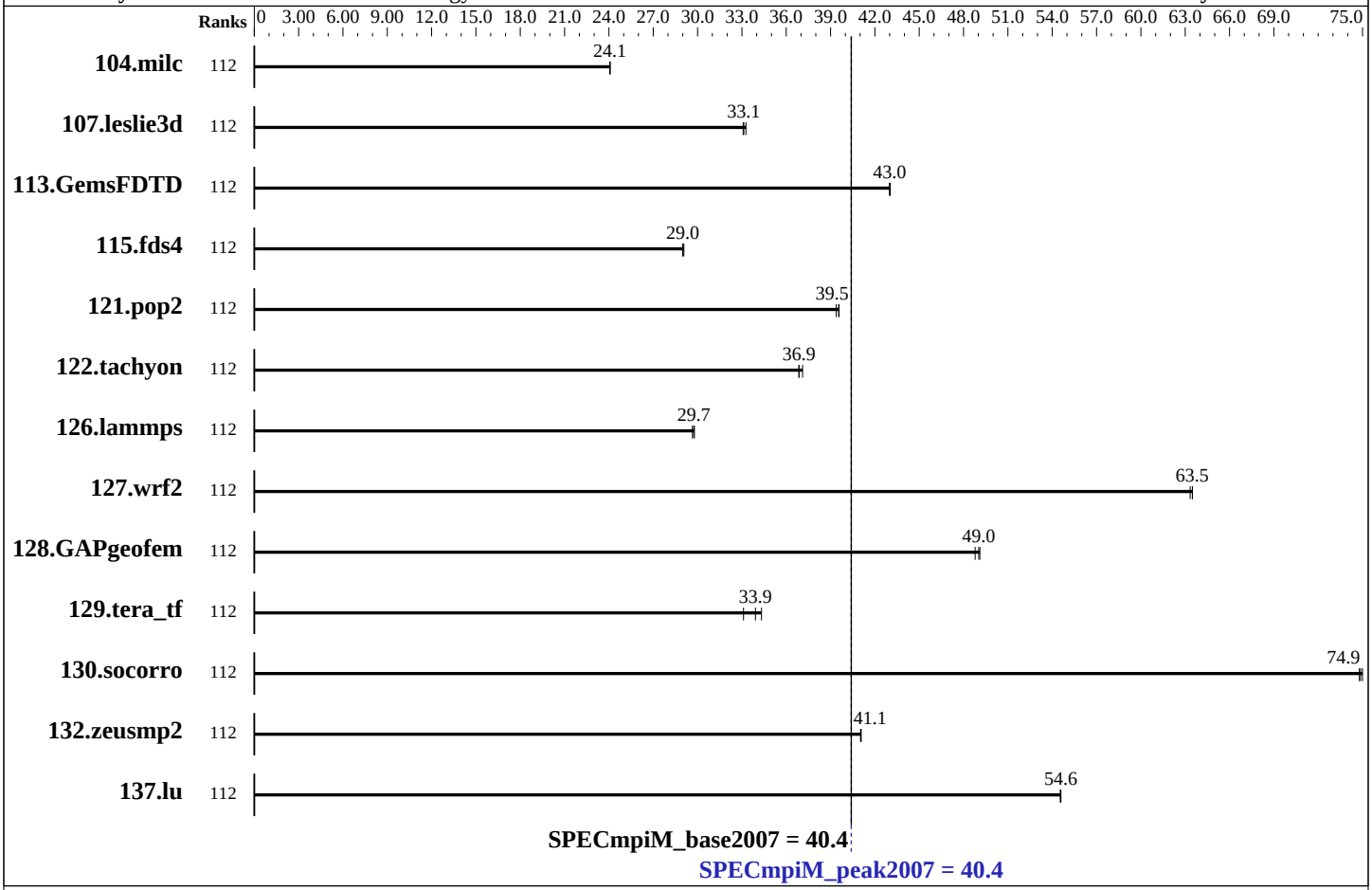
ThinkSystem SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

SPECmpiM_peak2007 = 40.4

SPECmpiM_base2007 = 40.4

MPI2007 license: 28
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Aug-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	112	65.0	24.1	65.0	24.1	**65.0**	**24.1**	112	65.0	24.1	65.0	24.1	**65.0**	**24.1**
107.leslie3d	112	**158**	**33.1**	157	33.3	158	33.1	112	**158**	**33.1**	157	33.3	158	33.1
113.GemsFDTD	112	**147**	**43.0**	147	43.0	147	43.0	112	**147**	**43.0**	147	43.0	147	43.0
115.fds4	112	67.1	29.1	67.3	29.0	**67.3**	**29.0**	112	67.1	29.1	67.3	29.0	**67.3**	**29.0**
121.pop2	112	**104**	**39.5**	104	39.6	105	39.4	112	**104**	**39.5**	104	39.6	105	39.4
122.tachyon	112	75.9	36.9	**75.9**	**36.9**	75.4	37.1	112	75.9	36.9	**75.9**	**36.9**	75.4	37.1
126.lammps	112	97.9	29.8	**98.0**	**29.7**	98.3	29.6	112	97.9	29.8	**98.0**	**29.7**	98.3	29.6
127.wrf2	112	123	63.5	123	63.3	**123**	**63.5**	112	123	63.5	123	63.3	**123**	**63.5**
128.GAPgeofem	112	42.3	48.8	**42.1**	**49.0**	42.1	49.1	112	42.3	48.8	**42.1**	**49.0**	42.1	49.1
129.tera_tf	112	80.6	34.3	**81.6**	**33.9**	83.6	33.1	112	80.6	34.3	**81.6**	**33.9**	83.6	33.1

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	112	51.0	74.8	50.9	75.0	**51.0**	**74.9**	112	51.0	74.8	50.9	75.0	**51.0**	**74.9**
132.zeusmp2	112	**75.6**	**41.1**	75.6	41.1	75.6	41.0	112	**75.6**	**41.1**	75.6	41.1	75.6	41.0
137.lu	112	67.3	54.6	67.4	54.5	**67.4**	**54.6**	112	67.3	54.6	67.4	54.5	**67.4**	**54.6**

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:	Intel Omni-Path
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 C++ Compiler 18.0 Update 3 for Linux Version 18.0.3 Build 20180410
C++ Compiler:	Intel C++ Compiler 18.0 Update 3 for Linux Version 18.0.3 Build 20180410
Fortran Compiler:	Intel Fortran Compiler 18.0 Update 3 for Linux Version 18.0.3 Build 20180410
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
MPI Library:	Intel MPI Library for Linux* OS Version 2018 Update 3 Build 20180411
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:	None
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:	Intel Omni-Path Fabric Adapter 100 Series
Number of Adapters:	1
Slot Type:	PCI-Express 3.0 x16
Data Rate:	100 Gb/s
Ports Used:	1

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Software

Adapter:	Intel Omni-Path Fabric Adapter 100 Series
Adapter Driver:	10.10.2.0.46
Adapter Firmware:	10.4.0.0.146
Operating System:	Red Hat Enterprise Linux Server release 8.2, Kernel 4.18.0-193.el8.x86_64
Local File System:	xfs
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

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Test date: Aug-2020
Hardware Availability: Oct-2020
Software Availability: Oct-2020

Node Description: ThinkSystem SR860 V2

Interconnect Type:	Intel Omni-Path

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:	None
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)
Disk Subsystem:	1 x 1 TB SATA 2.5" SSD
Other Hardware:	None
Adapter:	Intel Omni-Path Fabric Adapter 100 Series
Number of Adapters:	1
Slot Type:	PCI-Express 3.0 x16
Data Rate:	100 Gb/s
Ports Used:	1
Interconnect Type:	Intel Omni-Path

Software

Adapter:	Intel Omni-Path Fabric Adapter 100 Series
Adapter Driver:	10.10.2.0.46
Adapter Firmware:	10.4.0.0.146
Operating System:	Red Hat Enterprise Linux Server release 7.8
Local File System:	None
Shared File System:	NFS
System State:	Multi-User, run level 3
Other Software:	None

Interconnect Description: Intel Omni-Path

Hardware

Vendor:	Intel
Model:	Intel Omni-Path Fabric Adapter 100 Series
Switch Model:	Intel Omni-Path 100 Series
Number of Switches:	1
Number of Ports:	48
Data Rate:	100 Gb/s
Firmware:	10.3.0.0.60
Topology:	Mesh
Primary Use:	MPI Traffic

Software

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`

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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:

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`

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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