SPEC® MPIL2007 Result

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Lenovo Global Technology

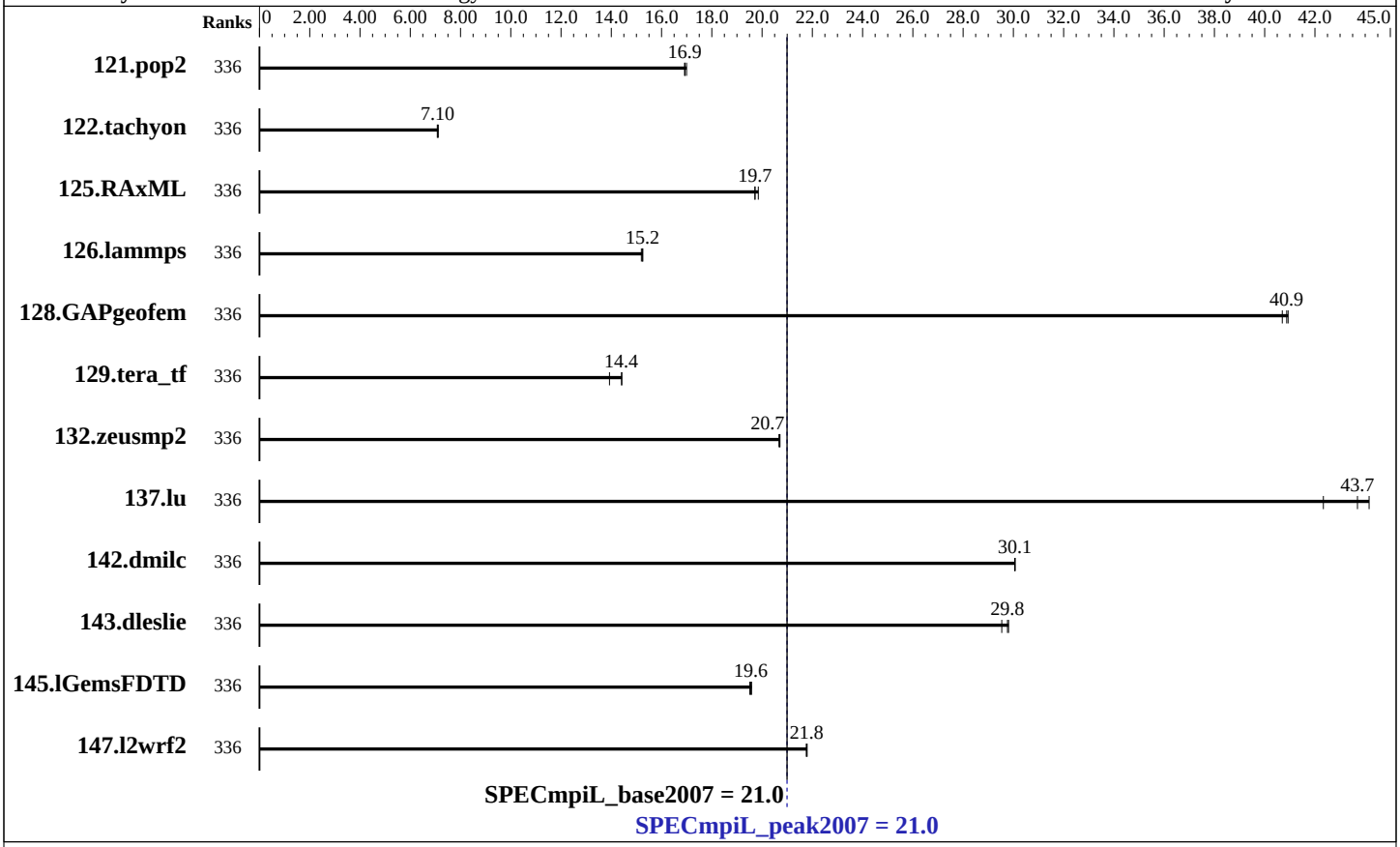
ThinkSystem SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

SPECmpiL_peak2007 = 21.0

SPECmpiL_base2007 = 21.0

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
121.pop2	336	**230**	**16.9**	229	17.0	230	16.9	336	**230**	**16.9**	229	17.0	230	16.9
122.tachyon	336	**274**	**7.10**	273	7.11	275	7.08	336	**274**	**7.10**	273	7.11	275	7.08
125.RAxML	336	148	19.7	**148**	**19.7**	147	19.8	336	148	19.7	**148**	**19.7**	147	19.8
126.lammps	336	161	15.3	162	15.2	**161**	**15.2**	336	161	15.3	162	15.2	**161**	**15.2**
128.GAPgeofem	336	145	40.9	**145**	**40.9**	146	40.7	336	145	40.9	**145**	**40.9**	146	40.7
129.tera_tf	336	78.9	13.9	**76.3**	**14.4**	76.2	14.4	336	78.9	13.9	**76.3**	**14.4**	76.2	14.4
132.zeusmp2	336	**102**	**20.7**	103	20.7	102	20.7	336	**102**	**20.7**	103	20.7	102	20.7
137.lu	336	**96.2**	**43.7**	99.3	42.3	95.2	44.2	336	**96.2**	**43.7**	99.3	42.3	95.2	44.2
142.dmilc	336	**123**	**30.1**	123	30.1	123	30.1	336	**123**	**30.1**	123	30.1	123	30.1
143.dleslie	336	105	29.5	**104**	**29.8**	104	29.8	336	105	29.5	**104**	**29.8**	104	29.8
145.lGemsFDTD	336	225	19.6	226	19.5	**226**	**19.6**	336	225	19.6	226	19.5	**226**	**19.6**
147.l2wrf2	336	377	21.8	**377**	**21.8**	376	21.8	336	377	21.8	**377**	**21.8**	376	21.8

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

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SPECmpiL_peak2007 = 21.0

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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

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:	336
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
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 5.3.18-22-default
Local File System:	xfs
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

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
Primary Use:	MPI and I/O 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`

Base Optimization Flags

C benchmarks:
`-O3 -ipo -xCORE-AVX512 -no-prec-div`

Continued on next page

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:

122.tachyon: `basepeak = yes`

125.RAxML: `basepeak = yes`

142.dmilc: `basepeak = yes`

C++ benchmarks:

126.lammps: `basepeak = yes`

Fortran benchmarks:

129.tera_tf: `basepeak = yes`

137.lu: `basepeak = yes`

143.dleslie: `basepeak = yes`

145.lGemsFDTD: `basepeak = yes`

Benchmarks using both Fortran and C:

121.pop2: `basepeak = yes`

128.GAPgeofem: `basepeak = yes`

132.zeusmp2: `basepeak = yes`

147.l2wrf2: `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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