SPEC® MPIM2007 Result

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Lenovo Global Technology

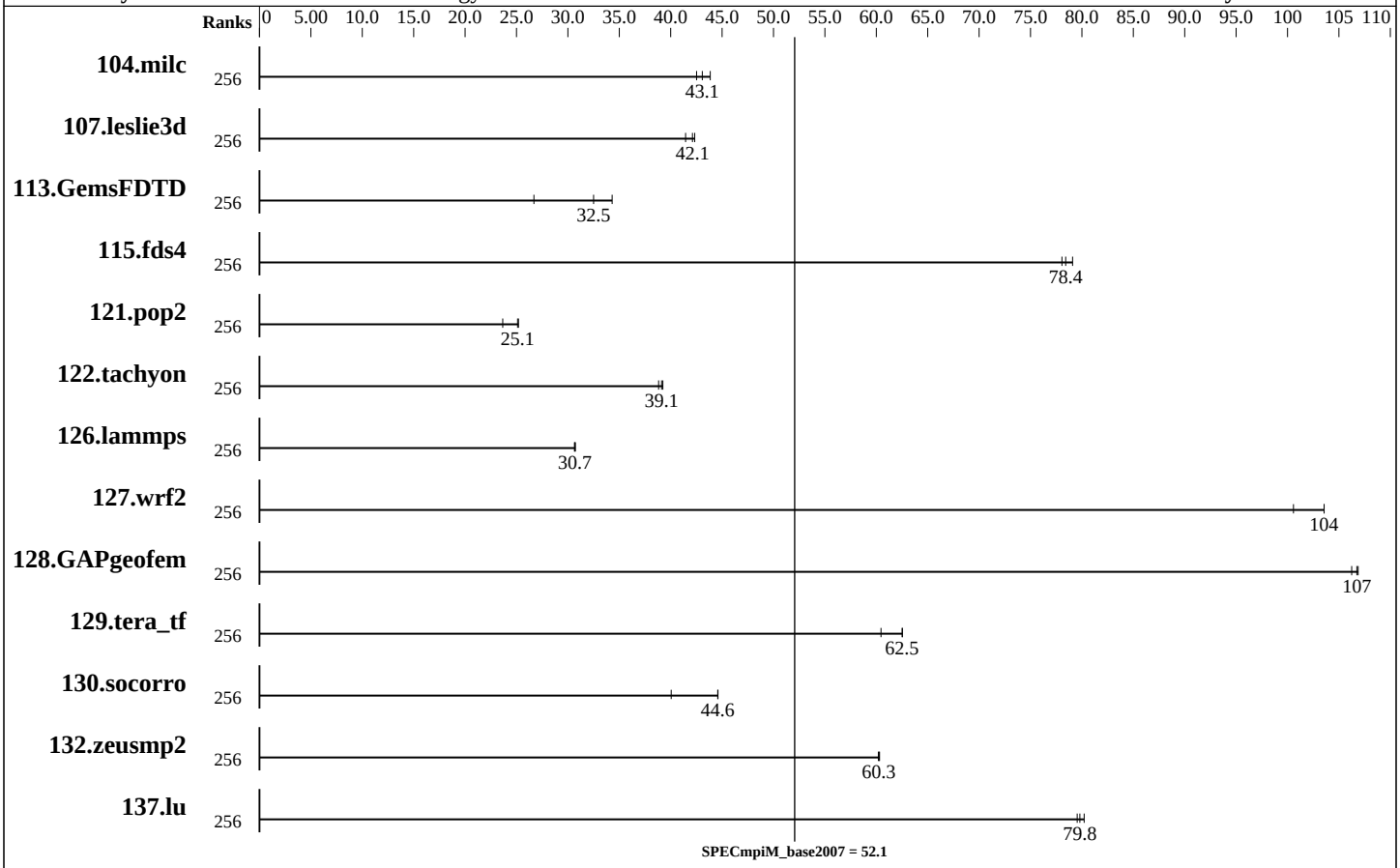
ThinkSystem SR665
(AMD EPYC 7H12, 2.6 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 52.1

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

Test date: Jan-2020
Hardware Availability: Jun-2020
Software Availability: Jun-2020



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	256	**36.3**	**43.1**	36.8	42.5	35.7	43.8							
107.leslie3d	256	**124**	**42.1**	123	42.3	126	41.4							
113.GemsFDTD	256	184	34.3	**194**	**32.5**	236	26.7							
115.fds4	256	25.0	78.1	**24.9**	**78.4**	24.7	79.1							
121.pop2	256	**164**	**25.1**	164	25.2	174	23.7							
122.tachyon	256	**71.5**	**39.1**	72.0	38.8	71.3	39.2							
126.lammps	256	**95.0**	**30.7**	94.9	30.7	95.1	30.6							
127.wrf2	256	**75.3**	**104**	77.5	101	75.3	104							
128.GAPgeofem	256	**19.3**	**107**	19.4	106	19.3	107							
129.tera_tf	256	**44.3**	**62.5**	44.3	62.5	45.8	60.5							

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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Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	256	**85.6**	**44.6**	85.6	44.6	95.3	40.0							
132.zeusmp2	256	**51.5**	**60.3**	51.4	60.3	51.5	60.2							
137.lu	256	45.8	80.2	46.2	79.5	**46.1**	**79.8**							

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 SR665
File Server Node: NFS
Total Compute Nodes: 2
Total Chips: 4
Total Cores: 256
Total Threads: 256
Total Memory: 2 TB
Base Ranks Run: 256
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C Compiler 20.0 for Linux Version 19.1.0.166 Build 20191121
C++ Compiler: Intel C++ Compiler 20.0 for Linux Version 19.1.0.166 Build 20191121
Fortran Compiler: Intel Fortran Compiler 20.0 for Linux Version 19.1.0.166 Build 20191121
Base Pointers: 64-bit
Peak Pointers: Not Applicable
MPI Library: MPICH MPI Library Version 3.3.2
Other MPI Info: None
Pre-processors: No
Other Software: None

Node Description: ThinkSystem SR665

Hardware

Number of nodes: 2
Uses of the node: compute
Vendor: Lenovo Global Technology
Model: SR665
CPU Name: AMD EPYC 7H12
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 128
Cores per chip: 64
Threads per core: 1
CPU Characteristics: None
CPU MHz: 2600
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 512 KB I+D on chip per core
L3 Cache: 256 MB I+D on chip per chip 16 MB shared / 4 cores
Other Cache: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)
Disk Subsystem: 1 x 480 GB SATA 2.5" SSD
Other Hardware: None
Adapter: Mellanox ConnectX-6 HDR Infiniband
Number of Adapters: 1
Slot Type: PCI-Express 4.0 x16

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Software

Adapter: Mellanox ConnectX-6 HDR Infiniband
Adapter Driver: 4.7-1.0.0.1.2
Adapter Firmware: 20.25.2006
Operating System: Red Hat Enterprise Linux Server release 8.1, 4.18.0-147.el8.x86_64
Local File System: xfs
Shared File System: None
System State: Multi-user, run level 3
Other Software: None

Node Description: ThinkSystem SR665

Data Rate:	200 Gbs/s
Ports Used:	1
Interconnect Type:	Mellanox ConnectX-6 HDR Infiniband Adapter

Node Description: NFS

Hardware

Number of nodes:	1
Uses of the node:	Fileserver
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR665
CPU Name:	AMD EPYC 7H12 CPU
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	128
Cores per chip:	64
Threads per core:	1
CPU Characteristics:	None
CPU MHz:	2600
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	256 MB I+D on chip per chip 16 MB shared / 4 cores
Other Cache:	None
Memory:	1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)
Disk Subsystem:	1 x 480 GB SATA 2.5" SSD
Other Hardware:	None
Adapter:	Mellanox ConnectX-6 HDR Infiniband
Number of Adapters:	1
Slot Type:	PCI-Express 4.0 x16
Data Rate:	200 Gb/s
Ports Used:	1
Interconnect Type:	Mellanox ConnectX-6 HDR Infiniband

Software

Adapter:	Mellanox ConnectX-6 HDR Infiniband
Adapter Driver:	4.7-1.0.0.1.2
Adapter Firmware:	20.25.2006
Operating System:	Red Hat Enterprise Linux Server release 8.1
Local File System:	None
Shared File System:	NFS
System State:	Multi-User, run level 3
Other Software:	None

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 1 x 32 GB RDIMM on each memory channel.
Add "idle=poll" into grub
BIOS settings:
```

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General Notes (Continued)

```
    Operating Mode : Maximum Performance Mode
    Hyper-Threading Technology (SMT): Enabled
    NPS4
  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:
`/opt/mpich/m332_I201_H47_R81/bin/mpicc`

C++ benchmarks:

126.lammps: `/opt/mpich/m332_I201_H47_R81/bin/mpicxx`

Fortran benchmarks:
`/opt/mpich/m332_I201_H47_R81/bin/mpif90`

Benchmarks using both Fortran and C:
`/opt/mpich/m332_I201_H47_R81/bin/mpicc`
`/opt/mpich/m332_I201_H47_R81/bin/mpif90`

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 -march=core-avx2 -no-prec-div -ipo`

C++ benchmarks:

126.lammps: `-O3 -march=core-avx2 -no-prec-div -ipo`

Fortran benchmarks:
`-O3 -march=core-avx2 -no-prec-div -ipo`

Continued on next page

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
`-O3 -march=core-avx2 -no-prec-div -ipo`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20200506.01.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20200506.01.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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