SPEC® MPIM2007 Result

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Lenovo Global Technology

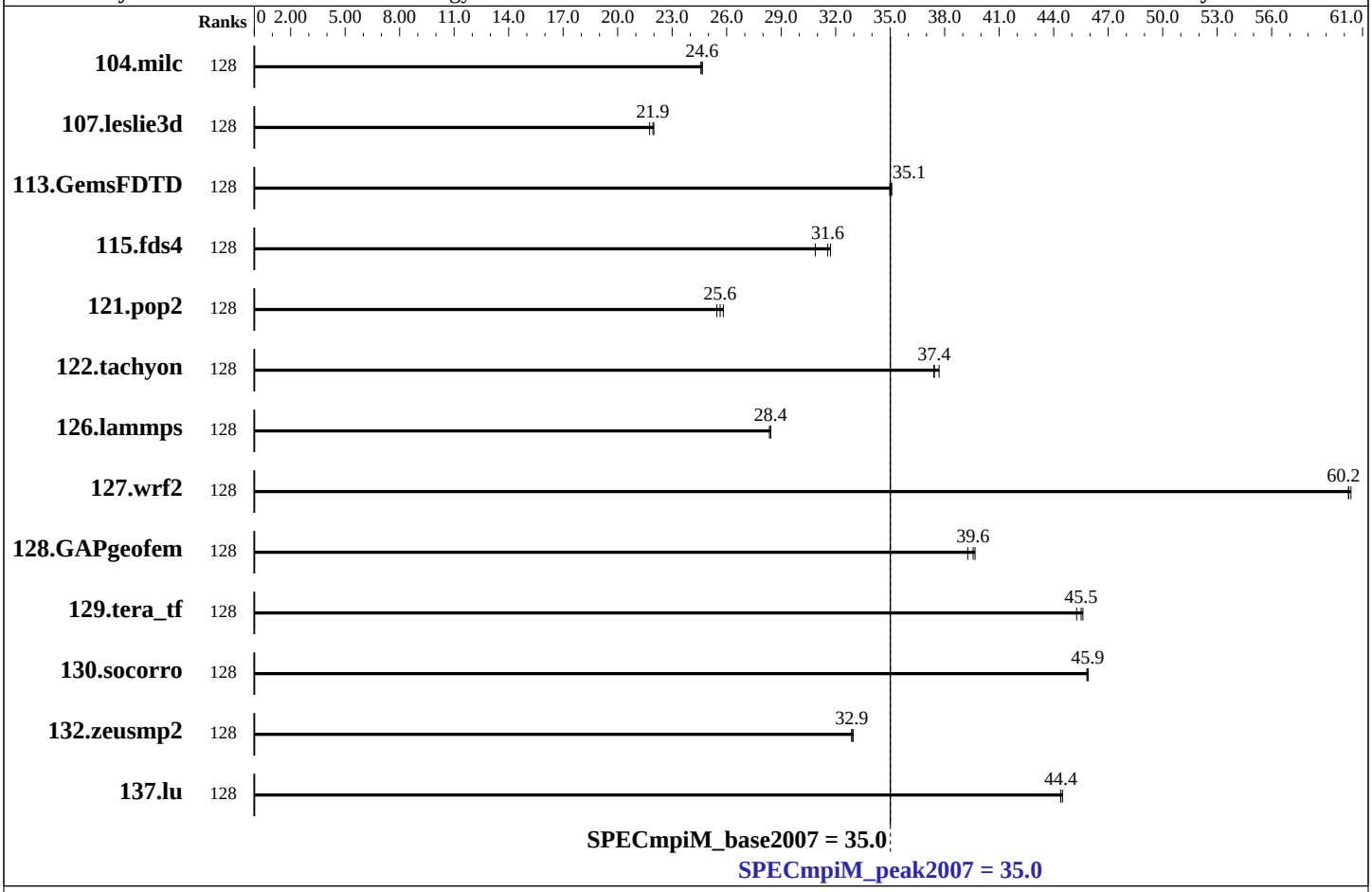
ThinkSystem SR665
(AMD EPYC 7763, 2.45 GHz)

SPECmpiM_peak2007 = 35.0

SPECmpiM_base2007 = 35.0

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

Test date: Mar-2021
Hardware Availability: Mar-2021
Software Availability: Mar-2021



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	128	63.5	24.7	63.7	24.6	**63.5**	**24.6**	128	63.5	24.7	63.7	24.6	**63.5**	**24.6**
107.leslie3d	128	**238**	**21.9**	240	21.8	237	22.0	128	**238**	**21.9**	240	21.8	237	22.0
113.GemsFDTD	128	**180**	**35.1**	180	35.1	180	35.0	128	**180**	**35.1**	180	35.1	180	35.0
115.fds4	128	63.2	30.9	61.5	31.7	**61.8**	**31.6**	128	63.2	30.9	61.5	31.7	**61.8**	**31.6**
121.pop2	128	162	25.5	**161**	**25.6**	160	25.8	128	162	25.5	**161**	**25.6**	160	25.8
122.tachyon	128	74.2	37.7	**74.7**	**37.4**	74.8	37.4	128	74.2	37.7	**74.7**	**37.4**	74.8	37.4
126.lammps	128	**103**	**28.4**	103	28.4	103	28.4	128	**103**	**28.4**	103	28.4	103	28.4
127.wrf2	128	**129**	**60.2**	129	60.4	129	60.2	128	**129**	**60.2**	129	60.4	129	60.2
128.GAPgeofem	128	**52.2**	**39.6**	52.6	39.3	52.1	39.7	128	**52.2**	**39.6**	52.6	39.3	52.1	39.7
129.tera_tf	128	**60.8**	**45.5**	61.2	45.3	60.7	45.6	128	**60.8**	**45.5**	61.2	45.3	60.7	45.6

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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Software Availability: Mar-2021

Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	128	83.2	45.9	83.3	45.8	**83.2**	**45.9**	128	83.2	45.9	83.3	45.8	**83.2**	**45.9**
132.zeusmp2	128	**94.3**	**32.9**	94.1	33.0	94.4	32.9	128	**94.3**	**32.9**	94.1	33.0	94.4	32.9
137.lu	128	82.8	44.4	82.6	44.5	**82.8**	**44.4**	128	82.8	44.4	82.6	44.5	**82.8**	**44.4**

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:	1
Total Chips:	2
Total Cores:	128
Total Threads:	128
Total Memory:	1 TB
Base Ranks Run:	128
Minimum Peak Ranks:	128
Maximum Peak Ranks:	128

Software Summary

C Compiler:	Intel C Compiler 20.2 for Linux Version 19.1.2.254 Build 20200623
C++ Compiler:	Intel C++ Compiler 20.2 for Linux Version 19.2.254 Build 20200623
Fortran Compiler:	Intel Fortran Compiler for Linux Version 19.2.254 Build 20200623
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
MPI Library:	Intel MPI Library for Linux Version 19.2.254 Build 20200623
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: ThinkSystem SR665

Hardware

Number of nodes:	1
Uses of the node:	compute
Vendor:	Lenovo Global Technology
Model:	SR665
CPU Name:	AMD EPYC 7763
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:	2450
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 32 MB shared / 8 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:	5.2-1.0.4
Adapter Firmware:	20.25.2006
Operating System:	Red Hat Enterprise Linux Server release 8.3, 4.18.0-240.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 7763 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:	2450
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 32 MB shared / 8 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:	5.2-1.0.4
Adapter Firmware:	20.25.2006
Operating System:	Red Hat Enterprise Linux Server release 8.3
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 64 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:
`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 -march=core-avx2 -no-prec-div`

C++ benchmarks:

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

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

Benchmarks using both Fortran and C:
`-O3 -ipo -march=core-avx2 -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/AMD_flags.html
http://www.spec.org/mpi2007/flags/Lenovo_Platform_Flags.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/mpi2007/flags/AMD_flags.xml
http://www.spec.org/mpi2007/flags/Lenovo_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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