SPEC® MPIM2007 Result

Lenovo

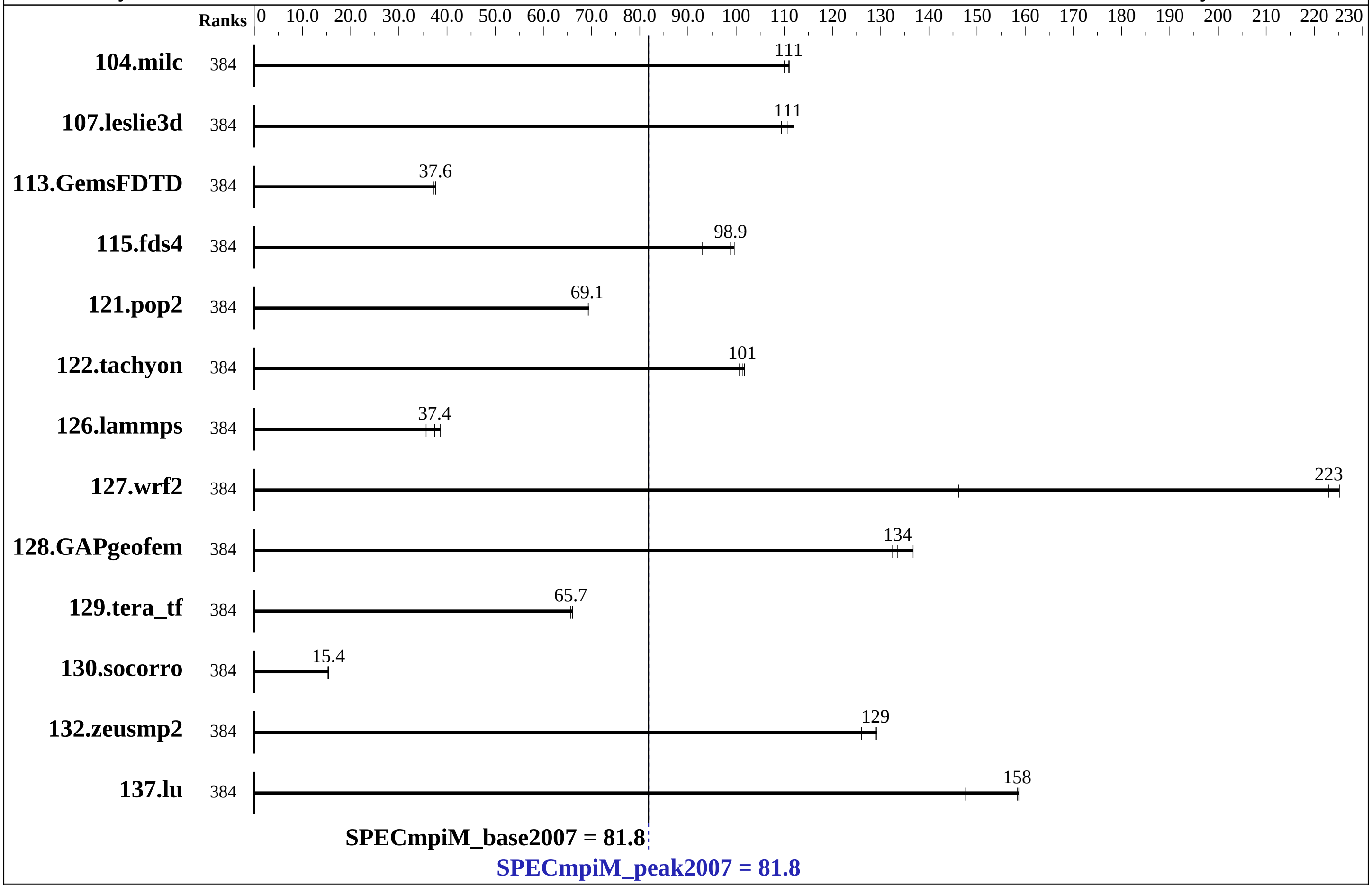
ThinkSystem SR665 V3 (AMD EPYC 9654)

SPECmpiM_peak2007 = 81.8

SPECmpiM_base2007 = 81.8

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

Test date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: Feb-2023



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	384	14.2	110	**14.1**	**111**	14.1	111	384	14.2	110	**14.1**	**111**	14.1	111
107.leslie3d	384	47.7	109	46.6	112	**47.1**	**111**	384	47.7	109	46.6	112	**47.1**	**111**
113.GemsFDTD	384	**168**	**37.6**	168	37.7	170	37.2	384	**168**	**37.6**	168	37.7	170	37.2
115.fds4	384	21.0	93.0	**19.7**	**98.9**	19.6	99.6	384	21.0	93.0	**19.7**	**98.9**	19.6	99.6
121.pop2	384	**59.7**	**69.1**	59.8	69.0	59.4	69.5	384	**59.7**	**69.1**	59.8	69.0	59.4	69.5
122.tachyon	384	**27.6**	**101**	27.5	102	27.8	101	384	**27.6**	**101**	27.5	102	27.8	101
126.lammps	384	81.7	35.7	**77.9**	**37.4**	75.4	38.6	384	81.7	35.7	**77.9**	**37.4**	75.4	38.6
127.wrf2	384	34.6	225	53.3	146	**35.0**	**223**	384	34.6	225	53.3	146	**35.0**	**223**
128.GAPgeofem	384	**15.5**	**134**	15.1	137	15.6	132	384	**15.5**	**134**	15.1	137	15.6	132
129.tera_tf	384	**42.1**	**65.7**	42.4	65.3	41.9	66.0	384	**42.1**	**65.7**	42.4	65.3	41.9	66.0

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)

	Base							Peak						
Benchmark	**Ranks**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Ranks**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
130.socorro	384	250	15.3	**248**	**15.4**	247	15.4	384	250	15.3	**248**	**15.4**	247	15.4
132.zeusmp2	384	24.6	126	24.0	129	**24.1**	**129**	384	24.6	126	24.0	129	**24.1**	**129**
137.lu	384	**23.2**	**158**	23.2	159	24.9	147	384	**23.2**	**158**	23.2	159	24.9	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 SR665 V3
Total Compute Nodes:	2
Total Chips:	4
Total Cores:	192
Total Threads:	384
Total Memory:	1536 GB
Base Ranks Run:	384
Minimum Peak Ranks:	384
Maximum Peak Ranks:	384

Software Summary

C Compiler:	AMD Optimizing C/C++ and Fortran Compilers (AOCC) Version 4.0.0 Build 389 for Linux
C++ Compiler:	AMD Optimizing C/C++ and Fortran Compilers (AOCC) Version 4.0.0 Build 389 for Linux
Fortran Compiler:	AMD Optimizing C/C++ and Fortran Compilers (AOCC) Version 4.0.0 Build 389 for Linux
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	Open MPI Library for Linux Version 4.1.1
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: ThinkSystem SR665 V3

Hardware

Number of nodes:	2
Uses of the node:	compute
Vendor:	Lenovo
Model:	ThinkSystem SR665 V3
CPU Name:	AMD EPYC 9654
CPU(s) orderable:	1, 2 chip
Chips enabled:	2
Cores enabled:	96
Cores per chip:	96
Threads per core:	2
CPU Characteristics:	Max. Boost Clock upto 3.7 GHz
CPU MHz:	2400
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	384 MB I+D on chip per chip 32 MB shared / 8 cores
Other Cache:	None
Memory:	768 GB (24 x 32 GB 2Rx8 PC5-4800B-R)
Disk Subsystem:	1x ThinkSystem 2.5" 5300 480GB SSD
Other Hardware:	None
Adapter:	Mellanox ConnectX-6 HDR
Number of Adapters:	1
Slot Type:	PCIe Gen5 x16
Data Rate:	200Gb

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Software

Adapter:	Mellanox ConnectX-6 HDR
Adapter Driver:	Mellanox
Adapter Firmware:	20.28.1002
Operating System:	Red Hat Enterprise Linux Server release 8.6, Kernel 4.18.0-372.9.1.el8.x86_64
Local File System:	ext4
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

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Node Description: ThinkSystem SR665 V3

Ports Used:	1
Interconnect Type:	Mellanox ConnectX-6 HDR

Submit Notes

```
The config file option 'submit' was used.
```

General Notes

```
MPI startup command:
  mpiexec command was used to start MPI jobs.
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:
mpicc

C++ benchmarks:

126.lammps: mpic++

Fortran benchmarks:
mpif90

Benchmarks using both Fortran and C:
mpicc mpif90

Base Portability Flags

104.milc: -DSPEC_MPI_LP64
115.fds4: -DSPEC_MPI_LP64
121.pop2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LP64
122.tachyon: -DSPEC_MPI_LP64
127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX -DSPEC_MPI_LP64
128.GAPgeofem: -DSPEC_MPI_LP64
130.socorro: -DSPEC_MPI_LP64
132.zeusmp2: -DSPEC_MPI_LP64

Base Optimization Flags

C benchmarks:
`-Ofast -flto -ffast-math -march=znver4 -lamdlibm`

C++ benchmarks:

126.lammps: `-Ofast -flto -ffast-math -march=znver4 -DMPICH_IGNORE_CXX_SEEK`

Fortran benchmarks:
`-Ofast -flto -ffast-math -march=znver4 -funroll-loops`

Benchmarks using both Fortran and C:

115.fds4: `-Ofast -flto -ffast-math -march=znver4 -funroll-loops`

121.pop2: `Same as 115.fds4`

127.wrf2: `Same as 115.fds4`

128.GAPgeofem: `-Ofast -flto -ffast-math -march=znver4 -funroll-loops -lamdlibm`

130.socorro: `Same as 115.fds4`

132.zeusmp2: `Same as 115.fds4`

Base Other Flags

Benchmarks using both Fortran and C:

127.wrf2: `-Wno-return-type`

Peak Optimization Flags

C benchmarks:

104.milc: `basepeak = yes`

122.tachyon: `basepeak = yes`

C++ benchmarks:

126.lammps: `basepeak = yes`

Fortran benchmarks:

Continued on next page

Peak Optimization Flags (Continued)

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 file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/amd2021_flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/amd2021_flags.xml`