SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Lenovo

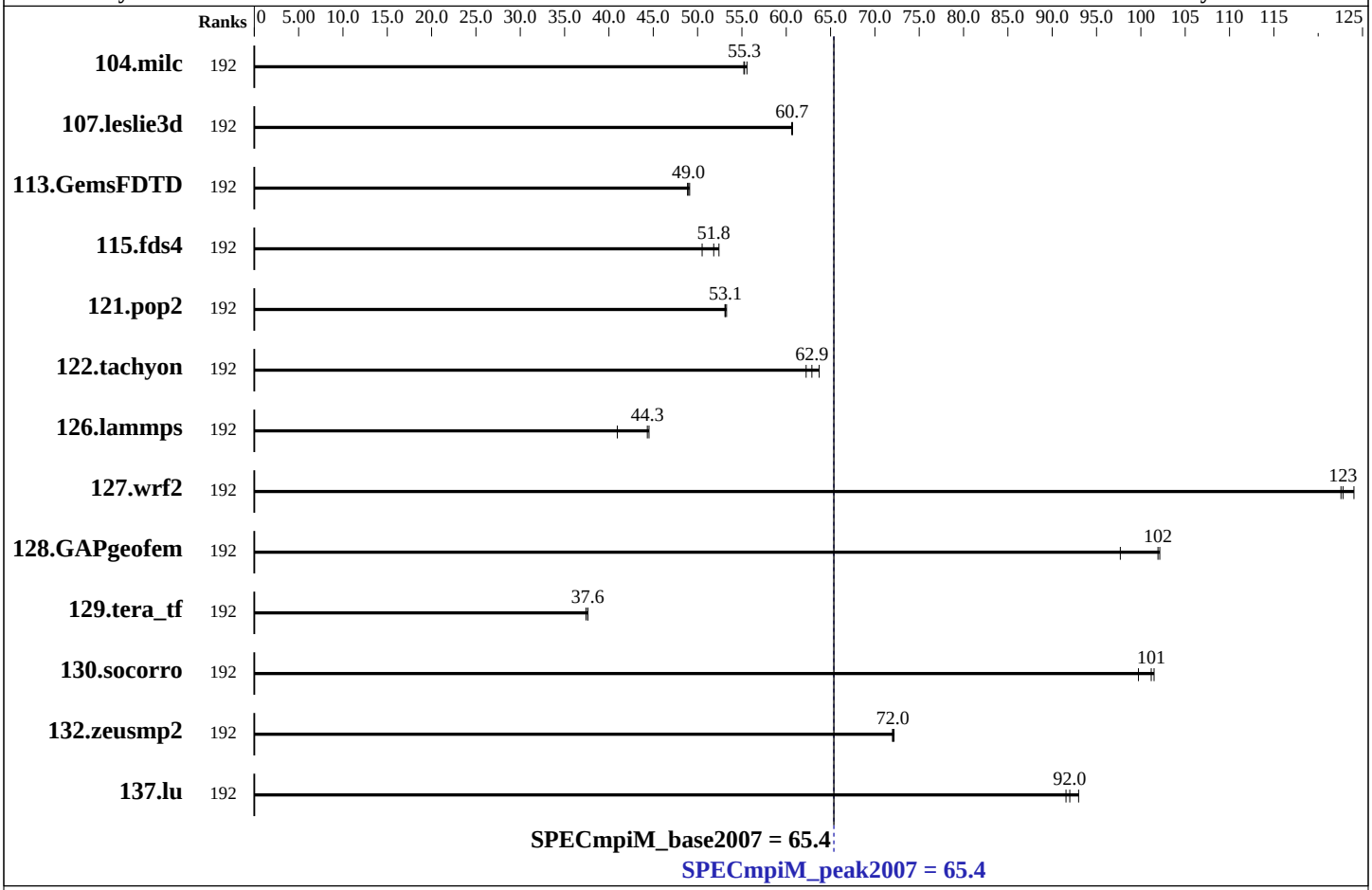
ThinkSystem SR665 V3 (AMD EPYC 9654)

SPECmpiM_peak2007 = 65.4

SPECmpiM_base2007 = 65.4

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	192	28.3	55.2	**28.3**	**55.3**	28.2	55.6	192	28.3	55.2	**28.3**	**55.3**	28.2	55.6
107.leslie3d	192	86.1	60.6	86.0	60.7	**86.0**	**60.7**	192	86.1	60.6	86.0	60.7	**86.0**	**60.7**
113.GemsFDTD	192	129	48.9	128	49.1	**129**	**49.0**	192	129	48.9	128	49.1	**129**	**49.0**
115.fds4	192	**37.6**	**51.8**	37.2	52.4	38.6	50.5	192	**37.6**	**51.8**	37.2	52.4	38.6	50.5
121.pop2	192	77.8	53.1	**77.7**	**53.1**	77.5	53.3	192	77.8	53.1	**77.7**	**53.1**	77.5	53.3
122.tachyon	192	**44.5**	**62.9**	43.9	63.7	44.9	62.2	192	**44.5**	**62.9**	43.9	63.7	44.9	62.2
126.lammps	192	71.2	40.9	65.5	44.5	**65.8**	**44.3**	192	71.2	40.9	65.5	44.5	**65.8**	**44.3**
127.wrf2	192	62.9	124	63.6	123	**63.5**	**123**	192	62.9	124	63.6	123	**63.5**	**123**
128.GAPgeofem	192	20.2	102	21.1	97.7	**20.3**	**102**	192	20.2	102	21.1	97.7	**20.3**	**102**
129.tera_tf	192	73.6	37.6	**73.6**	**37.6**	74.0	37.4	192	73.6	37.6	**73.6**	**37.6**	74.0	37.4

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	192	37.6	101	**37.7**	**101**	38.3	99.7	192	37.6	101	**37.7**	**101**	38.3	99.7
132.zeusmp2	192	43.1	72.0	**43.1**	**72.0**	43.0	72.2	192	43.1	72.0	**43.1**	**72.0**	43.0	72.2
137.lu	192	40.2	91.6	**40.0**	**92.0**	39.5	93.0	192	40.2	91.6	**40.0**	**92.0**	39.5	93.0

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:	1
Total Chips:	2
Total Cores:	96
Total Threads:	192
Total Memory:	768 GB
Base Ranks Run:	192
Minimum Peak Ranks:	192
Maximum Peak Ranks:	192

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:	1
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

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`

(*) Indicates an optimization flag that was found in a portability variable.

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`

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Peak Optimization Flags (Continued)

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 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`

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC MPI2007 v2.0.1.
Report generated on Wed Feb 22 13:33:12 2023 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 22 February 2023.