SPEC® MPIM2007 Result

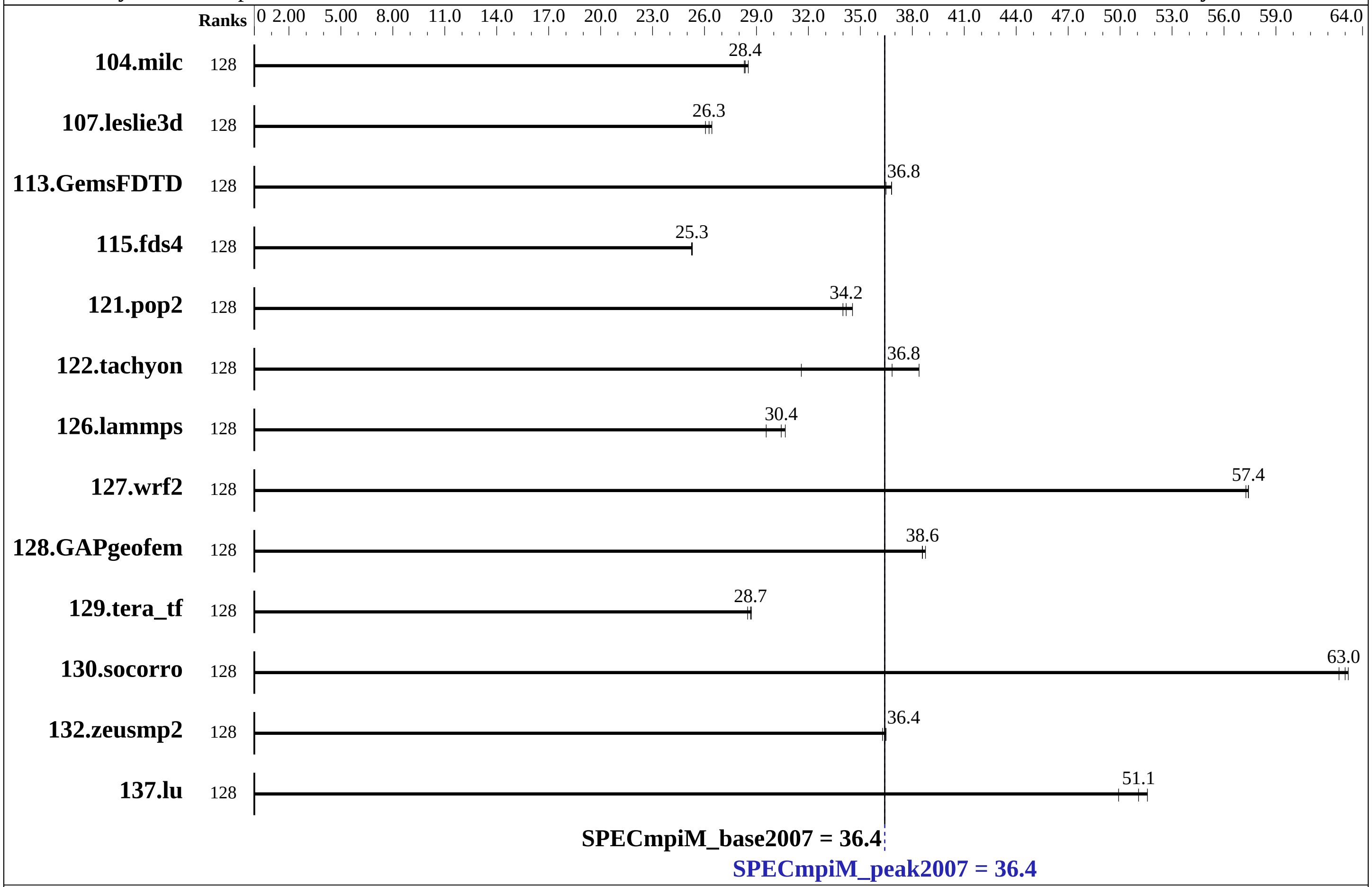
Supermicro

A+ Server 1025CS-TNR (AMD EPYC 9754)

SPECmpiM_peak2007 = 36.4

SPECmpiM_base2007 = 36.4

MPI2007 license:	6569	**Test date:**	May-2023
Test sponsor:	Supermicro	**Hardware Availability:**	Jun-2023
Tested by:	Supermicro	**Software Availability:**	Nov-2022



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	128	54.9	28.5	**55.2**	**28.4**	55.3	28.3	128	54.9	28.5	**55.2**	**28.4**	55.3	28.3
107.leslie3d	128	200	26.1	198	26.4	**199**	**26.3**	128	200	26.1	198	26.4	**199**	**26.3**
113.GemsFDTD	128	173	36.5	171	36.8	**171**	**36.8**	128	173	36.5	171	36.8	**171**	**36.8**
115.fds4	128	77.3	25.3	77.1	25.3	**77.2**	**25.3**	128	77.3	25.3	77.1	25.3	**77.2**	**25.3**
121.pop2	128	119	34.5	121	34.0	**121**	**34.2**	128	119	34.5	121	34.0	**121**	**34.2**
122.tachyon	128	72.9	38.4	**75.9**	**36.8**	88.5	31.6	128	72.9	38.4	**75.9**	**36.8**	88.5	31.6
126.lammps	128	**95.8**	**30.4**	95.1	30.7	98.6	29.6	128	**95.8**	**30.4**	95.1	30.7	98.6	29.6
127.wrf2	128	**136**	**57.4**	136	57.4	136	57.3	128	**136**	**57.4**	136	57.4	136	57.3
128.GAPgeofem	128	53.3	38.8	**53.5**	**38.6**	53.5	38.6	128	53.3	38.8	**53.5**	**38.6**	53.5	38.6
129.tera_tf	128	97.2	28.5	**96.6**	**28.7**	96.4	28.7	128	97.2	28.5	**96.6**	**28.7**	96.4	28.7

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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Test sponsor: Supermicro
Tested by: Supermicro
Test date: May-2023
Hardware Availability: Jun-2023
Software Availability: Nov-2022

Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	128	60.4	63.2	60.9	62.6	**60.6**	**63.0**	128	60.4	63.2	60.9	62.6	**60.6**	**63.0**
132.zeusmp2	128	85.1	36.5	**85.1**	**36.4**	85.5	36.3	128	85.1	36.5	**85.1**	**36.4**	85.5	36.3
137.lu	128	71.3	51.6	73.6	49.9	**72.0**	**51.1**	128	71.3	51.6	73.6	49.9	**72.0**	**51.1**

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:	A+ Server 1025CS-TNR
Total Compute Nodes:	1
Total Chips:	1
Total Cores:	128
Total Threads:	256
Total Memory:	768 GB
Base Ranks Run:	128
Minimum Peak Ranks:	128
Maximum Peak Ranks:	128

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 4.1.5
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: A+ Server 1025CS-TNR

Hardware

Number of nodes:	1
Uses of the node:	compute
Vendor:	Supermicro
Model:	A+ Server 1025CS-TNR
CPU Name:	AMD EPYC 9754
CPU(s) orderable:	1 chip
Chips enabled:	1
Cores enabled:	128
Cores per chip:	128
Threads per core:	2
CPU Characteristics:	Max. Boost Clock upto 3.1GHz
CPU MHz:	2250
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	256 MB I+D on chip per chip 16 MB shared / 8 cores
Other Cache:	None
Memory:	768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)
Disk Subsystem:	1 x 480 GB NVMe PCIe Gen4.0
Other Hardware:	None
Adapter:	None
Number of Adapters:	0
Slot Type:	None
Data Rate:	None

Continued on next page

Software

Adapter:	None
Adapter Driver:	None
Adapter Firmware:	None
Operating System:	Ubuntu 22.04.2 LTS Kernel 5.15.0-71-generic
Local File System:	ext4
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

Node Description: A+ Server 1025CS-TNR

Ports Used:	0
Interconnect Type:	None

Submit Notes

```
The config file option 'submit' was used.
mpirun --allow-run-as-root -np $ranks $command
```

General Notes

```
Environment variables set by runspec before the start of the run:
GOMP_CPU_AFFINITY = "0-128"
KMP_BLOCKTIME = "200"
KMP_LIBRARY = "turnaround"
OMP_DYNAMIC = "false"
OMP_NESTED = "FALSE"
OMP_PLACES = "threads"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "128"

 MPI startup command:
   mpirun command was used to start MPI jobs.
 RAM configuration:
   Compute nodes have 1 x 64 GB RDIMM on each memory channel.
 BIOS settings:
   NUMA nodes per socket = NPS4
   L3 Cache as NUMA Domain = Enabled
   Determinism Control = Manual
   Determinism Slider = Power
   TDP Control = Manual
   TDP = 400
   PPT Control = Manual
   PPT = 400


 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.

Submitted_by: Henry Lai <henryl@supermicro.com.tw>
Submitted: Tue May 16 23:42:20 EDT 2023
Submission: mpi2007-20230516-00691.sub
```

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`
126.lammps: `-DMPICH_IGNORE_CXX_SEEK`
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 -ljemalloc -lflang`

C++ benchmarks:

126.lammps: `-Ofast -flto -ffast-math -march=znver4 -lamdlibm -ljemalloc -lflang`

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

Benchmarks using both Fortran and C:
`-Ofast -flto -ffast-math -march=znver4 -funroll-loops -lamdlibm -ljemalloc -lflang`

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:

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.20230614.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/amd2021_flags.20230614.xml

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

Tested with SPEC MPI2007 v2.0.1.
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