



SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
(AMD EPYC 7763, 2.45 GHz)

SPECmpiM_peak2007 = 33.4

SPECmpiM_base2007 = 33.4

MPI2007 license: 28

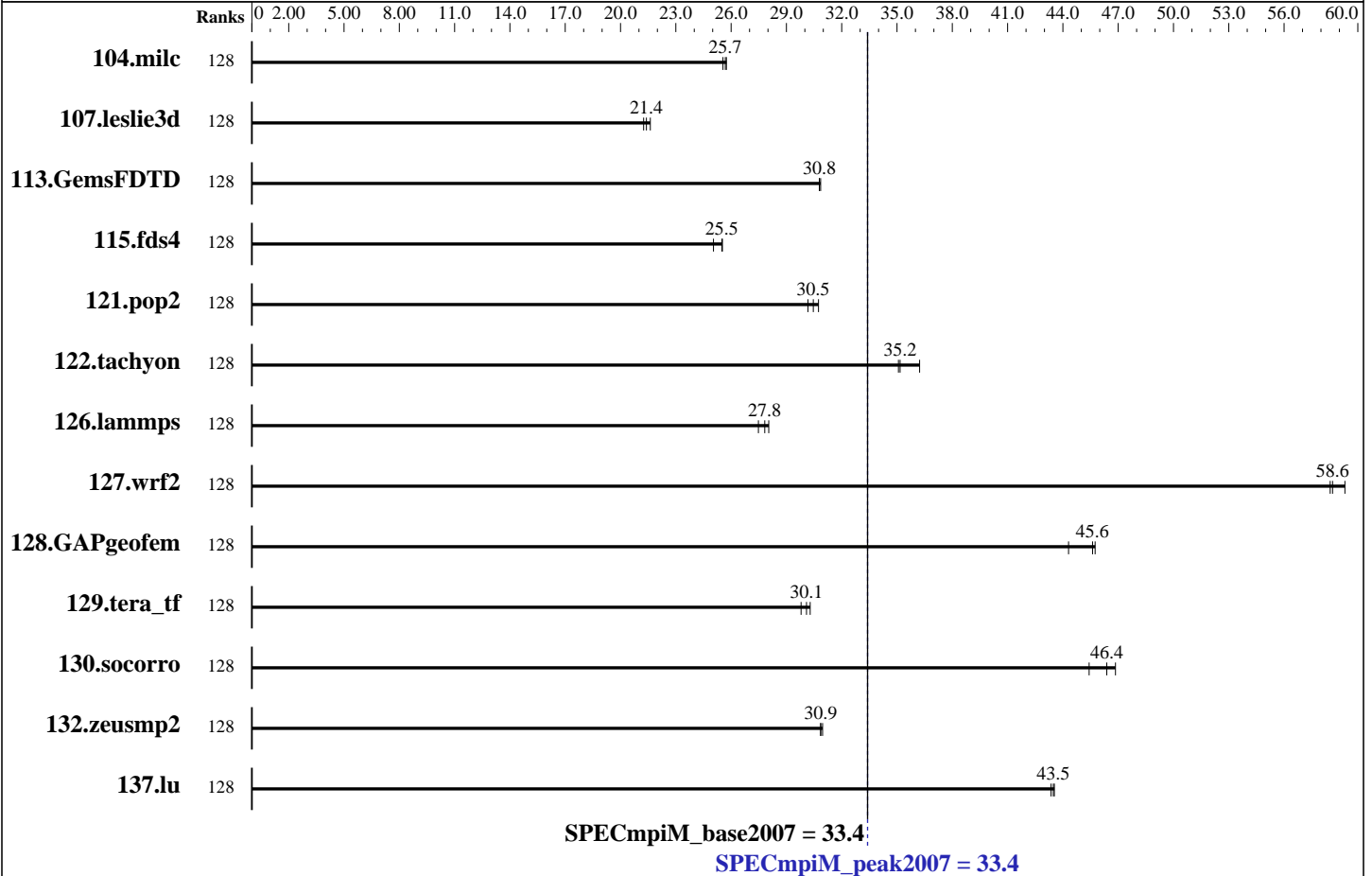
Test sponsor: Lenovo Global Technology

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	60.9	25.7	61.2	25.6	60.8	25.7	128	60.9	25.7	61.2	25.6	60.8	25.7		
107.leslie3d	128	241	21.6	244	21.4	246	21.3	128	241	21.6	244	21.4	246	21.3		
113.GemsFDTD	128	204	30.9	205	30.8	205	30.8	128	204	30.9	205	30.8	205	30.8		
115.fds4	128	76.4	25.5	76.5	25.5	77.9	25.0	128	76.4	25.5	76.5	25.5	77.9	25.0		
121.pop2	128	134	30.7	136	30.5	137	30.2	128	134	30.7	136	30.5	137	30.2		
122.tachyon	128	77.2	36.2	79.7	35.1	79.5	35.2	128	77.2	36.2	79.7	35.1	79.5	35.2		
126.lammps	128	104	28.0	105	27.8	106	27.5	128	104	28.0	105	27.8	106	27.5		
127.wrf2	128	131	59.3	133	58.6	133	58.5	128	131	59.3	133	58.6	133	58.5		
128.GAPgeofem	128	46.6	44.3	45.1	45.7	45.3	45.6	128	46.6	44.3	45.1	45.7	45.3	45.6		
129.tera_tf	128	91.4	30.3	92.9	29.8	92.0	30.1	128	91.4	30.3	92.9	29.8	92.0	30.1		

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	128	84.0	45.4	81.5	46.9	82.3	46.4	128	84.0	45.4	81.5	46.9	82.3	46.4
132.zeusmp2	128	100	31.0	101	30.9	101	30.9	128	100	31.0	101	30.9	101	30.9
137.lu	128	84.5	43.5	84.4	43.5	84.8	43.4	128	84.5	43.5	84.4	43.5	84.8	43.4

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: AMD Optimizing C Compiler for Linux
 Version 2.3.0 Build 2020_11_10
 C++ Compiler: AMD Optimizing C++ Compiler for Linux
 Version 2.3.0 Build 2020_11_10
 Fortran Compiler: AMD Optimizing Fortran Compiler for Linux
 Version 2.3.0 Build 2020_11_10
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 MPI Library: Open MPI Library for Linux
 Version 4.1.0
 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

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

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Software Availability: Mar-2021

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:

mpicc

C++ benchmarks:

126.lammps: mpicxx

Fortran benchmarks:

mpifort

Benchmarks using both Fortran and C:

mpicc mpifort

Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG
126.lammps: -DMPICH_IGNORE_CXX_SEEK
127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX -Wno-return-type

Base Optimization Flags

C benchmarks:

-Ofast -flto -ffast-math -march=znver3 -mavx2 -lamdlibm

C++ benchmarks:

126.lammps: -Ofast -flto -ffast-math -march=znver3 -mavx2 -lamdlibm

Fortran benchmarks:

-Ofast -flto -ffast-math -march=znver3 -mavx2 -funroll-loops
-lamdlibm

Benchmarks using both Fortran and C:

-Ofast -flto -ffast-math -march=znver3 -mavx2 -lamdlibm
-funroll-loops



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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/AMD_flags.20210315.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/mpi2007/flags/AMD_flags.20210315.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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