



SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
(AMD EPYC 7763, 2.45 GHz)

SPECmpiM_peak2007 = 62.6

SPECmpiM_base2007 = 62.1

MPI2007 license: 28

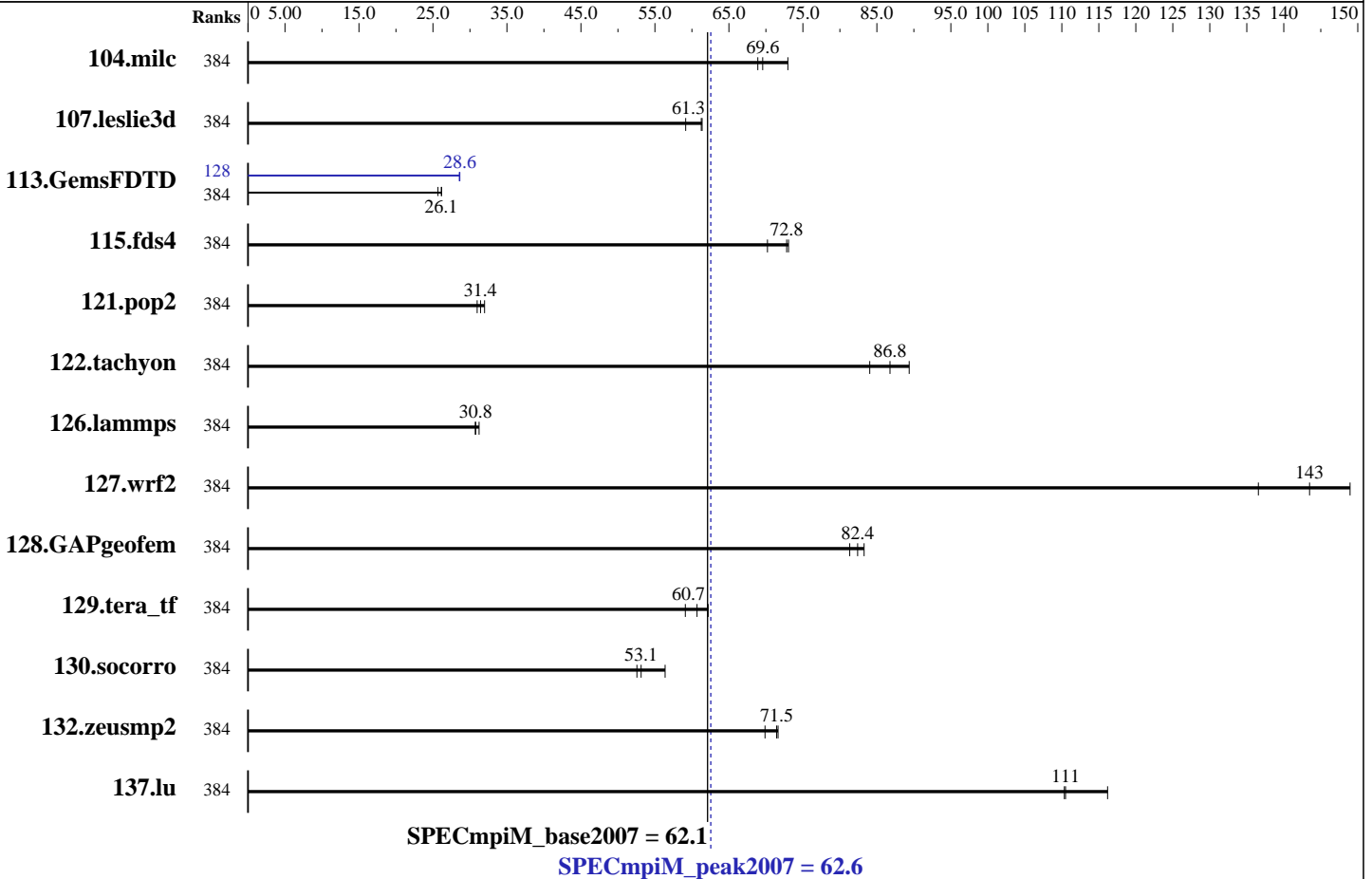
Test sponsor: Lenovo Global Technology

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	384	22.7	68.9	<u>22.5</u>	<u>69.6</u>	21.4	73.0	384	22.7	68.9	<u>22.5</u>	<u>69.6</u>	21.4	73.0		
107.leslie3d	384	85.0	61.4	88.2	59.2	<u>85.2</u>	<u>61.3</u>	384	85.0	61.4	88.2	59.2	<u>85.2</u>	<u>61.3</u>		
113.GemsFDTD	384	246	25.7	<u>241</u>	<u>26.1</u>	241	26.2	128	221	28.6	<u>220</u>	<u>28.6</u>	220	28.6		
115.fds4	384	<u>26.8</u>	<u>72.8</u>	27.8	70.2	26.7	73.1	384	<u>26.8</u>	<u>72.8</u>	27.8	70.2	26.7	73.1		
121.pop2	384	129	32.0	<u>131</u>	<u>31.4</u>	133	31.0	384	129	32.0	<u>131</u>	<u>31.4</u>	133	31.0		
122.tachyon	384	31.3	89.4	<u>32.2</u>	<u>86.8</u>	33.3	84.0	384	31.3	89.4	<u>32.2</u>	<u>86.8</u>	33.3	84.0		
126.lammps	384	<u>94.7</u>	<u>30.8</u>	94.9	30.7	93.3	31.2	384	<u>94.7</u>	<u>30.8</u>	94.9	30.7	93.3	31.2		
127.wrf2	384	52.3	149	<u>54.3</u>	<u>143</u>	57.1	137	384	52.3	149	<u>54.3</u>	<u>143</u>	57.1	137		
128.GAPgeofem	384	24.8	83.3	<u>25.1</u>	<u>82.4</u>	25.4	81.3	384	24.8	83.3	<u>25.1</u>	<u>82.4</u>	25.4	81.3		
129.tera_tf	384	<u>45.6</u>	<u>60.7</u>	44.5	62.2	46.8	59.1	384	<u>45.6</u>	<u>60.7</u>	44.5	62.2	46.8	59.1		

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	384	67.7	56.4	72.6	52.6	71.8	53.1	384	67.7	56.4	72.6	52.6	71.8	53.1
132.zeusmp2	384	43.3	71.6	44.4	69.9	43.4	71.5	384	43.3	71.6	44.4	69.9	43.4	71.5
137.lu	384	31.6	116	33.3	111	33.3	110	384	31.6	116	33.3	111	33.3	110

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
 Interconnect: Mellanox ConnectX-6 HDR
 File Server Node: NFS
 Total Compute Nodes: 3
 Total Chips: 6
 Total Cores: 384
 Total Threads: 384
 Total Memory: 3 TB
 Base Ranks Run: 384
 Minimum Peak Ranks: 128
 Maximum Peak Ranks: 384

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
 Version 4.1.0
 Other MPI Info: None
 Pre-processors: No
 Other Software: None

Node Description: ThinkSystem SR665

Hardware

Number of nodes: 3
 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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Tested by: Lenovo Global Technology

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

Software

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

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

Interconnect Description: Mellanox ConnectX-6 HDR

Hardware

Software

Vendor: Mellanox
Model: Infiniband HDR 200Gb/s Switch
Switch Model: QM8700 Series
Number of Switches: 1
Number of Ports: 40
Data Rate: 200 Gb/s
Firmware: 3.9.0606
Topology: Mesh

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Interconnect Description: Mellanox ConnectX-6 HDR

Primary Use: MPI Traffic

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:

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.

Compiler Invocation

C benchmarks:

mpicc

C++ benchmarks:

126.lammps: mpicxx

Fortran benchmarks:

mpifort

Benchmarks using both Fortran and C:

mpicc mpifort

Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG

126.lammps: -DMPICH_IGNORE_CXX_SEEK

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Portability Flags (Continued)

127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX -Wno-return-type

Base Optimization Flags

C benchmarks:

-Ofast -flto -ffast-math -march=znver2 -mno-avx2
-L/home/amd-libm/lib -lamdlibm

C++ benchmarks:

126.lammps: -Ofast -flto -ffast-math -march=znver2 -mno-avx2
-L/home/amd-libm/lib -lamdlibm

Fortran benchmarks:

-Ofast -flto -ffast-math -march=znver2 -mno-avx2 -funroll-loops
-L/home/amd-libm/lib -lamdlibm

Benchmarks using both Fortran and C:

-Ofast -flto -ffast-math -march=znver2 -mno-avx2 -funroll-loops
-L/home/amd-libm/lib -lamdlibm

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: -Ofast -flto -ffast-math -march=znver2 -mno-avx2
-funroll-loops -L/home/amd-libm/lib -lamdlibm

129.tera_tf: basepeak = yes

137.lu: basepeak = yes

Benchmarks using both Fortran and C:

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Peak Optimization Flags (Continued)

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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