



SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
(AMD EPYC 7763, 2.45 GHz)

SPECmpim_peak2007 = 52.6

SPECmpim_base2007 = 52.6

MPI2007 license: 28

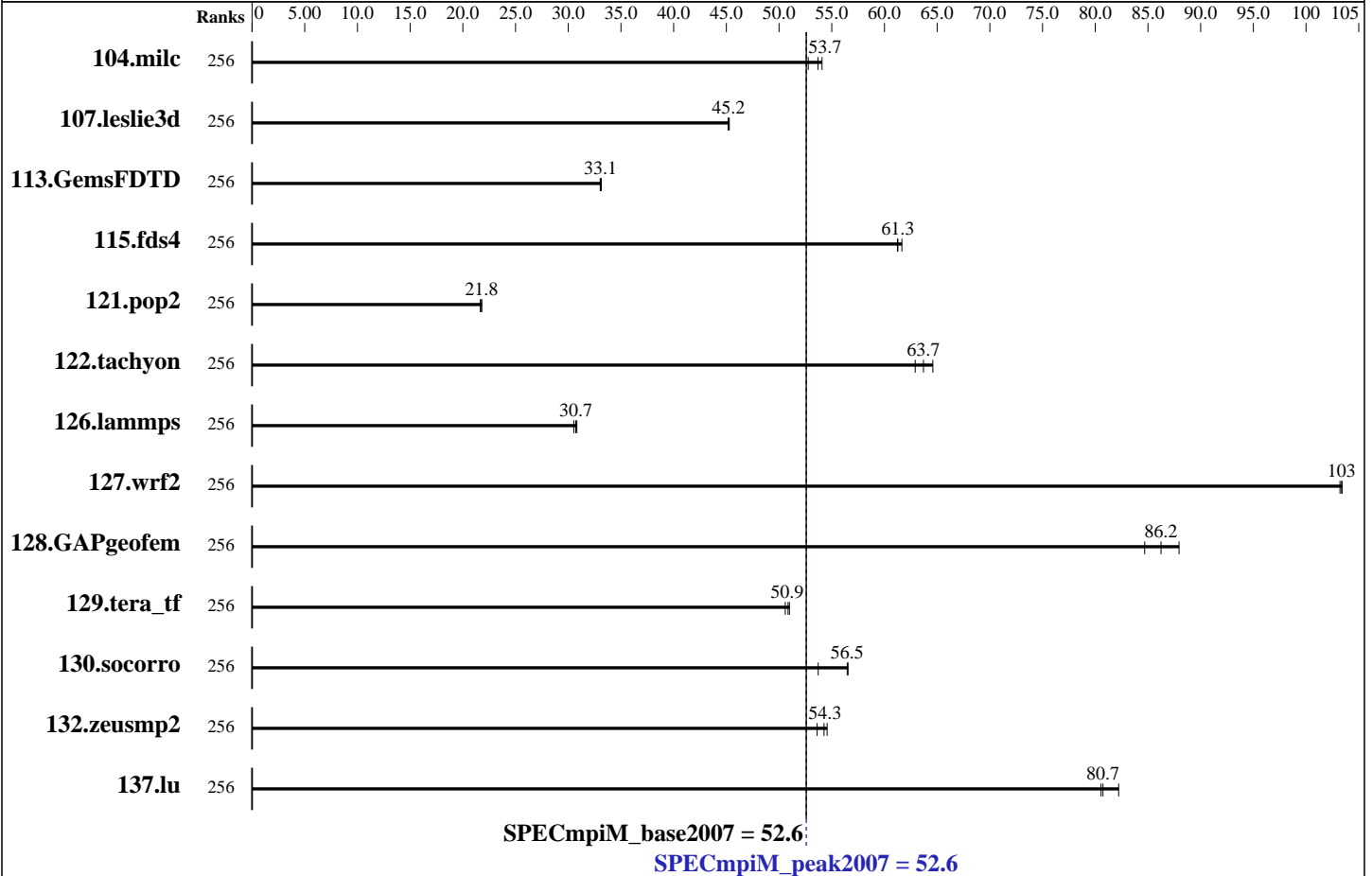
Test sponsor: Lenovo Global Technology

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	256	28.9	54.1	<u>29.1</u>	<u>53.7</u>	29.7	52.8	256	28.9	54.1	<u>29.1</u>	<u>53.7</u>	29.7	52.8		
107.leslie3d	256	115	45.3	<u>115</u>	<u>45.2</u>	116	45.2	256	115	45.3	<u>115</u>	<u>45.2</u>	116	45.2		
113.GemsFDTD	256	<u>191</u>	<u>33.1</u>	190	33.1	191	33.0	256	<u>191</u>	<u>33.1</u>	190	33.1	191	33.0		
115.fds4	256	31.9	61.2	<u>31.8</u>	<u>61.3</u>	31.6	61.7	256	31.9	61.2	<u>31.8</u>	<u>61.3</u>	31.6	61.7		
121.pop2	256	191	21.7	<u>190</u>	<u>21.8</u>	189	21.8	256	191	21.7	<u>190</u>	<u>21.8</u>	189	21.8		
122.tachyon	256	<u>43.9</u>	<u>63.7</u>	43.3	64.6	44.5	62.9	256	<u>43.9</u>	<u>63.7</u>	43.3	64.6	44.5	62.9		
126.lammps	256	<u>94.9</u>	<u>30.7</u>	95.5	30.5	94.6	30.8	256	<u>94.9</u>	<u>30.7</u>	95.5	30.5	94.6	30.8		
127.wrf2	256	75.4	103	75.5	103	<u>75.4</u>	<u>103</u>	256	75.4	103	75.5	103	<u>75.4</u>	<u>103</u>		
128.GAPgeofem	256	<u>23.9</u>	<u>86.2</u>	23.5	88.0	24.4	84.7	256	<u>23.9</u>	<u>86.2</u>	23.5	88.0	24.4	84.7		
129.tera_tf	256	54.7	50.6	54.3	51.0	<u>54.4</u>	<u>50.9</u>	256	54.7	50.6	54.3	51.0	<u>54.4</u>	<u>50.9</u>		

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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Software Availability: Mar-2021

Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	256	<u>67.6</u>	<u>56.5</u>	67.5	56.5	71.1	53.7	256	<u>67.6</u>	<u>56.5</u>	67.5	56.5	71.1	53.7
132.zeusmp2	256	<u>57.2</u>	<u>54.3</u>	57.9	53.6	56.9	54.6	256	<u>57.2</u>	<u>54.3</u>	57.9	53.6	56.9	54.6
137.lu	256	<u>45.5</u>	<u>80.7</u>	45.6	80.5	44.7	82.2	256	<u>45.5</u>	<u>80.7</u>	45.6	80.5	44.7	82.2

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: 2
 Total Chips: 4
 Total Cores: 256
 Total Threads: 256
 Total Memory: 2 TB
 Base Ranks Run: 256
 Minimum Peak Ranks: 256
 Maximum Peak Ranks: 256

Software Summary

C Compiler: AMD Optimizing C Compiler for Linux
 Version 3.0.0 Build 2020_12_10
 C++ Compiler: AMD Optimizing C++ Compiler for Linux
 Version 3.0.0 Build 2020_12_10
 Fortran Compiler: AMD Optimizing Fortran Compiler for Linux
 Version 3.0.0 Build 2020_12_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: 2
 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

Interconnect Description: Mellanox ConnectX-6 HDR

	Hardware
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

Software

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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.

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

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Base 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=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

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

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Peak Optimization Flags (Continued)

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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