



SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR655
(AMD EPYC 7763, 2.45 GHz)

SPECmpim_peak2007 = 30.7

SPECmpim_base2007 = 30.7

MPI2007 license: 28

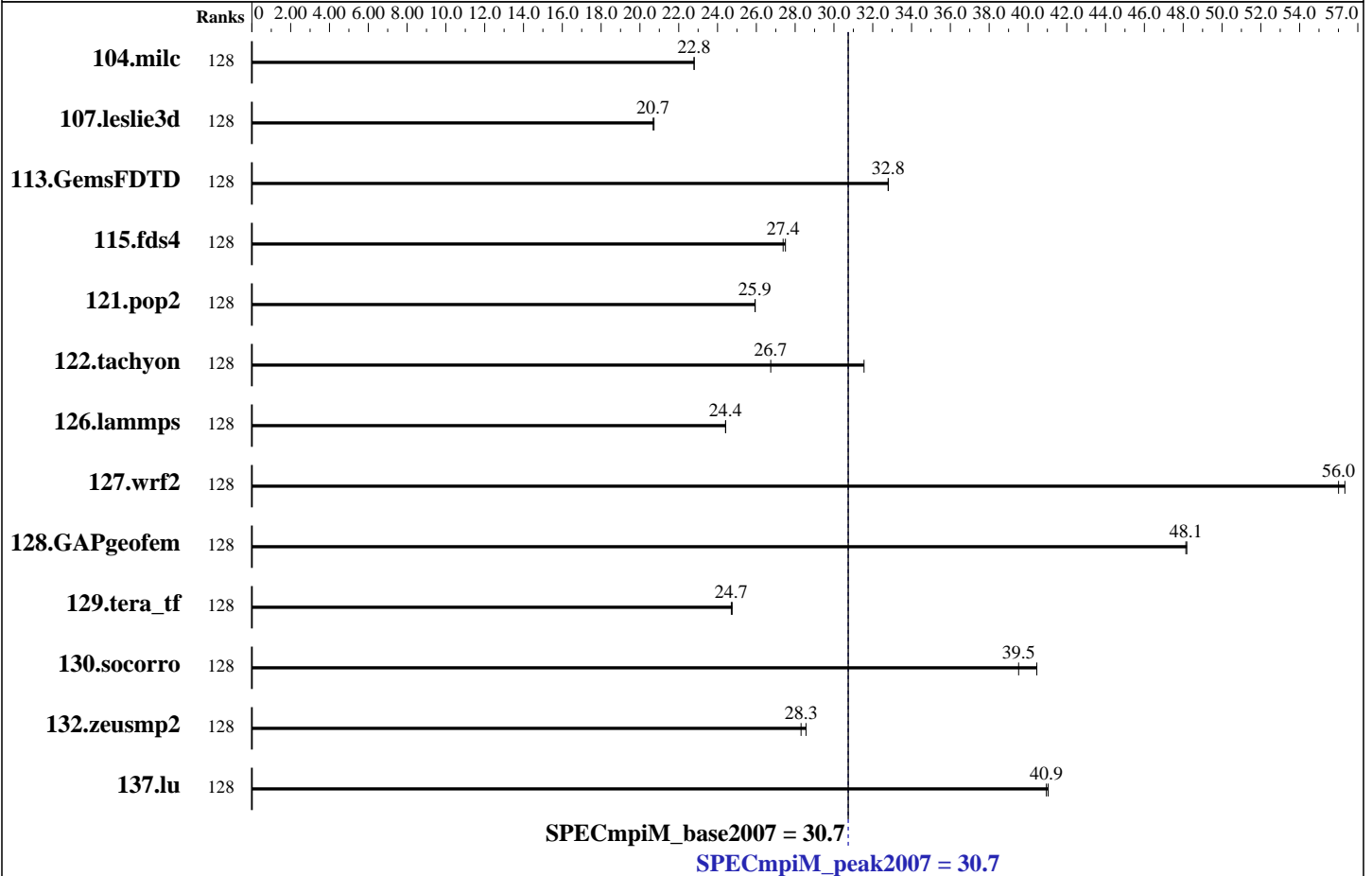
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Mar-2021

Hardware Availability: Jun-2021

Software Availability: Jun-2021



Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	128	68.7	22.8	68.6	22.8			128	68.7	22.8	68.6	22.8				
107.leslie3d	128	252	20.7	252	20.7			128	252	20.7	252	20.7				
113.GemsFDTD	128	192	32.8	192	32.8			128	192	32.8	192	32.8				
115.fds4	128	70.9	27.5	71.3	27.4			128	70.9	27.5	71.3	27.4				
121.pop2	128	159	25.9	159	25.9			128	159	25.9	159	25.9				
122.tachyon	128	105	26.7	88.6	31.6			128	105	26.7	88.6	31.6				
126.lammps	128	119	24.4	119	24.4			128	119	24.4	119	24.4				
127.wrf2	128	139	56.0	138	56.3			128	139	56.0	138	56.3				
128.GAPgeofem	128	42.9	48.2	42.9	48.1			128	42.9	48.2	42.9	48.1				
129.tera_tf	128	112	24.7	112	24.8			128	112	24.7	112	24.8				

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	94.4	40.5	<u>96.6</u>	<u>39.5</u>			128	94.4	40.5	<u>96.6</u>	<u>39.5</u>				
132.zeusmp2	128	109	28.6	<u>110</u>	<u>28.3</u>			128	109	28.6	<u>110</u>	<u>28.3</u>				
137.lu	128	<u>89.8</u>	<u>40.9</u>	89.6	41.0			128	<u>89.8</u>	<u>40.9</u>	89.6	41.0				

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 SR655
 Interconnect: Mellanox ConnectX-6 HDR
 File Server Node: NFS
 Total Compute Nodes: 2
 Total Chips: 2
 Total Cores: 128
 Total Threads: 128
 Total Memory: 512 GB
 Base Ranks Run: 128
 Minimum Peak Ranks: 128
 Maximum Peak Ranks: 128

Software Summary

C Compiler: Intel C Compiler 20.4 for Linux
 Version 19.1.3.304 Build 20200925
 C++ Compiler: Intel C++ Compiler 20.4 for Linux
 Version 19.1.3.304 Build 20200925
 Fortran Compiler: Intel Fortran Compiler 20.4 for Linux
 Version 19.1.3.304 Build 20200925
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 MPI Library: Intel MPI Library for Linux
 Version 2019 Update 11 Build 20210330
 Other MPI Info: None
 Pre-processors: No
 Other Software: None

Node Description: ThinkSystem SR655

Hardware

Number of nodes: 2
 Uses of the node: compute
 Vendor: Lenovo Global Technology
 Model: SR655
 CPU Name: AMD EPYC 7763
 CPU(s) orderable: 1 chips
 Chips enabled: 1
 Cores enabled: 64
 Cores per chip: 64
 Threads per core: 1
 CPU Characteristics: Turbo up to 3.5 GHz
 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: 256 GB (8 x 32 GB 2Rx8 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: Jun-2021

Node Description: ThinkSystem SR655

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 SR655
CPU Name: AMD EPYC 7763 CPU
CPU(s) orderable: 1 chips
Chips enabled: 1
Cores enabled: 64
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: 256 GB (8 x 32 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 32 GB RDIMM on each memory channel.

Add "idle=poll" into grub

BIOS settings:

Operating Mode : Maximum Performance Mode

Hyper-Threading Technology (SMT): Disabled

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:

mpiicc

C++ benchmarks:

126.lammps: mpiicpc

Fortran benchmarks:

mpiifort

Benchmarks using both Fortran and C:

mpiicc mpiifort

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
130.socorro: -assume nostd_intent_in

Base Optimization Flags

C benchmarks:

-O3 -march=core-avx2 -no-prec-div -ipo

C++ benchmarks:

126.lammps: -O3 -march=core-avx2 -no-prec-div -ipo

Fortran benchmarks:

-O3 -march=core-avx2 -no-prec-div -ipo

Benchmarks using both Fortran and C:

-O3 -march=core-avx2 -no-prec-div -ipo

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

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Peak Optimization Flags (Continued)

127.wrf2: basepeak = yes

128.GAPgeofem: basepeak = yes

130.socorro: basepeak = yes

132.zeusmp2: basepeak = yes

The flags files that were used to format this result can be browsed at

http://www.spec.org/mpi2007/flags/Lenovo_Platform_Flags.html

http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20200506.01.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/mpi2007/flags/Lenovo_Platform_Flags.xml

http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20200506.01.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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