



SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
(AMD EPYC 7H12, 2.6 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 70.1

MPI2007 license: 28

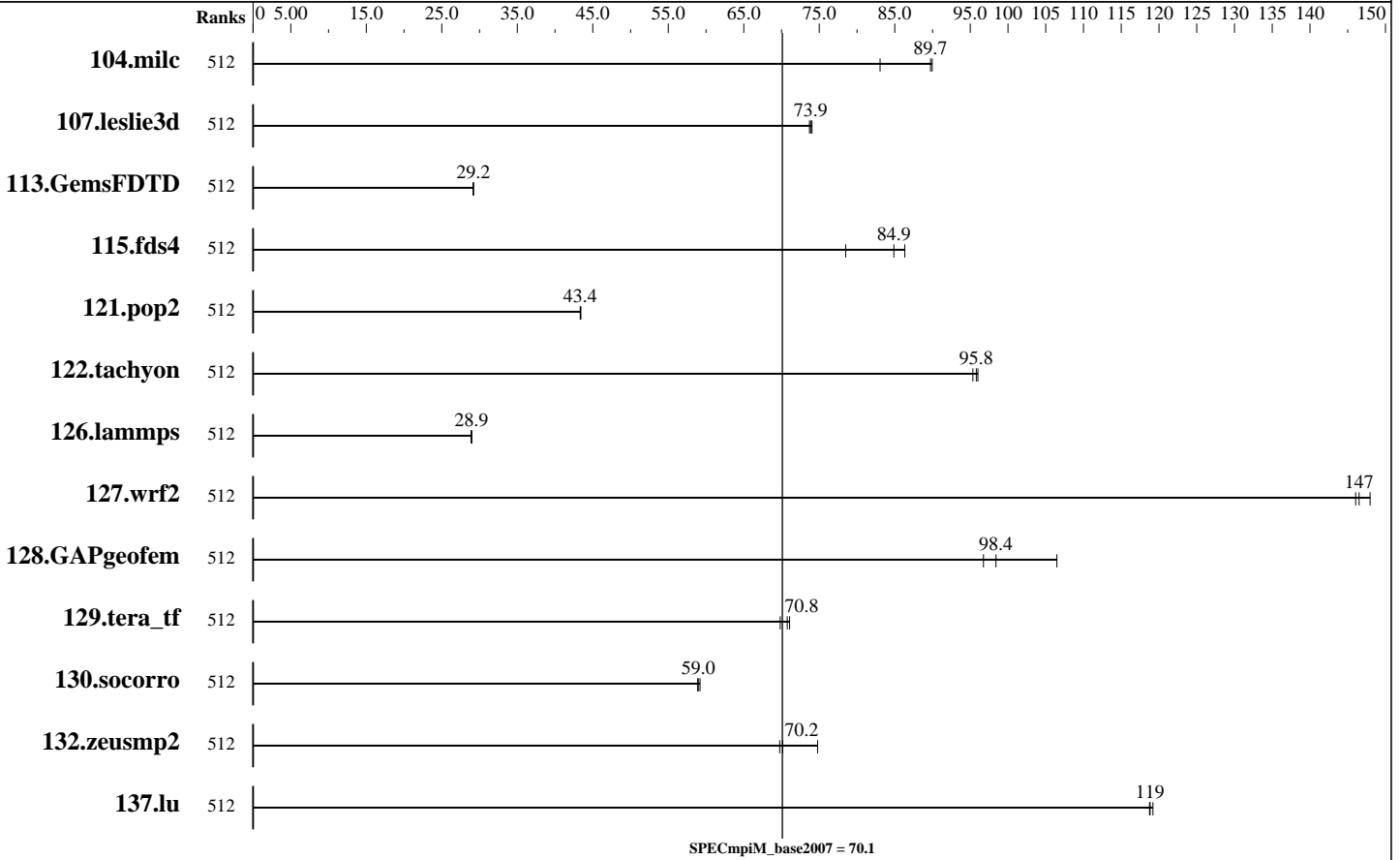
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Jan-2020

Hardware Availability: Jun-2020

Software Availability: Jun-2020



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	512	18.8	83.1	<u>17.4</u>	<u>89.7</u>	17.4	90.0							
107.leslie3d	512	70.5	74.0	70.8	73.7	<u>70.7</u>	<u>73.9</u>							
113.GemsFDTD	512	216	29.1	216	29.2	<u>216</u>	<u>29.2</u>							
115.fds4	512	22.6	86.3	<u>23.0</u>	<u>84.9</u>	24.9	78.5							
121.pop2	512	95.2	43.3	<u>95.2</u>	<u>43.4</u>	95.1	43.4							
122.tachyon	512	<u>29.2</u>	<u>95.8</u>	29.1	96.0	29.3	95.4							
126.lammps	512	101	29.0	101	28.9	<u>101</u>	<u>28.9</u>							
127.wrf2	512	52.7	148	<u>53.2</u>	<u>147</u>	53.4	146							
128.GAPgeofem	512	19.4	106	21.3	96.7	<u>21.0</u>	<u>98.4</u>							
129.tera_tf	512	39.6	69.8	38.9	71.1	<u>39.1</u>	<u>70.8</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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Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	512	64.7	59.0	64.8	58.9	64.5	59.2							
132.zeusmp2	512	41.5	74.8	44.2	70.2	44.5	69.8							
137.lu	512	30.8	119	31.0	119	30.9	119							

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: 4
 Total Chips: 8
 Total Cores: 512
 Total Threads: 512
 Total Memory: 4 TB
 Base Ranks Run: 512
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

Software Summary

C Compiler: AMD Optimizing C Compiler for Linux
 Version 2.1 Build 1030.2019_11_12
 C++ Compiler: AMD Optimizing C++ Compiler for Linux
 Version 2.1 Build 1030.2019_11_12
 Fortran Compiler: AMD Optimizing Fortran Compiler for Linux
 Version 2.1 Build 1030.2019_11_12
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 MPI Library: OpenMPI MPI Library
 Version 4.0.2
 Other MPI Info: None
 Pre-processors: No
 Other Software: None

Node Description: ThinkSystem SR665

Hardware

Number of nodes: 4
 Uses of the node: compute
 Vendor: Lenovo Global Technology
 Model: SR665
 CPU Name: AMD EPYC 7H12
 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: 2600
 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
 16 MB shared / 4 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: 4.7-1.0.0.1.2
 Adapter Firmware: 20.25.2006
 Operating System: Red Hat Enterprise Linux Server release 8.1,
 4.18.0-147.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-2020

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 7H12 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:	2600
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
	16 MB shared / 4 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:	4.7-1.0.0.1.2
Adapter Firmware:	20.25.2006
Operating System:	Red Hat Enterprise Linux Server release 8.1
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 EDR 100Gb/s Switch
Switch Model:	SB7800 Series
Number of Switches:	1
Number of Ports:	36
Data Rate:	100 Gb/s
Firmware:	3.9.0300
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 32 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:

/opt/openmpi/0402_A21_H47_RH81/bin/mpicc

C++ benchmarks:

126.lammps: /opt/openmpi/0402_A21_H47_RH81/bin/mpicxx

Fortran benchmarks:

/opt/openmpi/0402_A21_H47_RH81/bin/mp ifort

Benchmarks using both Fortran and C:

/opt/openmpi/0402_A21_H47_RH81/bin/mpicc

/opt/openmpi/0402_A21_H47_RH81/bin/mp ifort

Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG

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Base Portability Flags (Continued)

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=znver2 -mavx2
-L/home/AMD_libm/amd-libm/lib -lamdlibm

C++ benchmarks:

126.lammps: -Ofast -flto -ffast-math -march=znver2 -mavx2
-L/home/AMD_libm/amd-libm/lib -lamdlibm

Fortran benchmarks:

-Ofast -flto -ffast-math -march=znver2 -funroll-loops -mavx2
-L/home/AMD_libm/amd-libm/lib -lamdlibm

Benchmarks using both Fortran and C:

-Ofast -flto -ffast-math -march=znver2 -mavx2 -funroll-loops
-L/home/AMD_libm/amd-libm/lib -lamdlibm

The flags file that was used to format this result can be browsed at

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

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

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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