



# SPEC® MPIM2007 Result

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## Lenovo Global Technology

ThinkSystem SR665  
(AMD EPYC 7H12, 2.6 GHz)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 52.1

MPI2007 license: 28

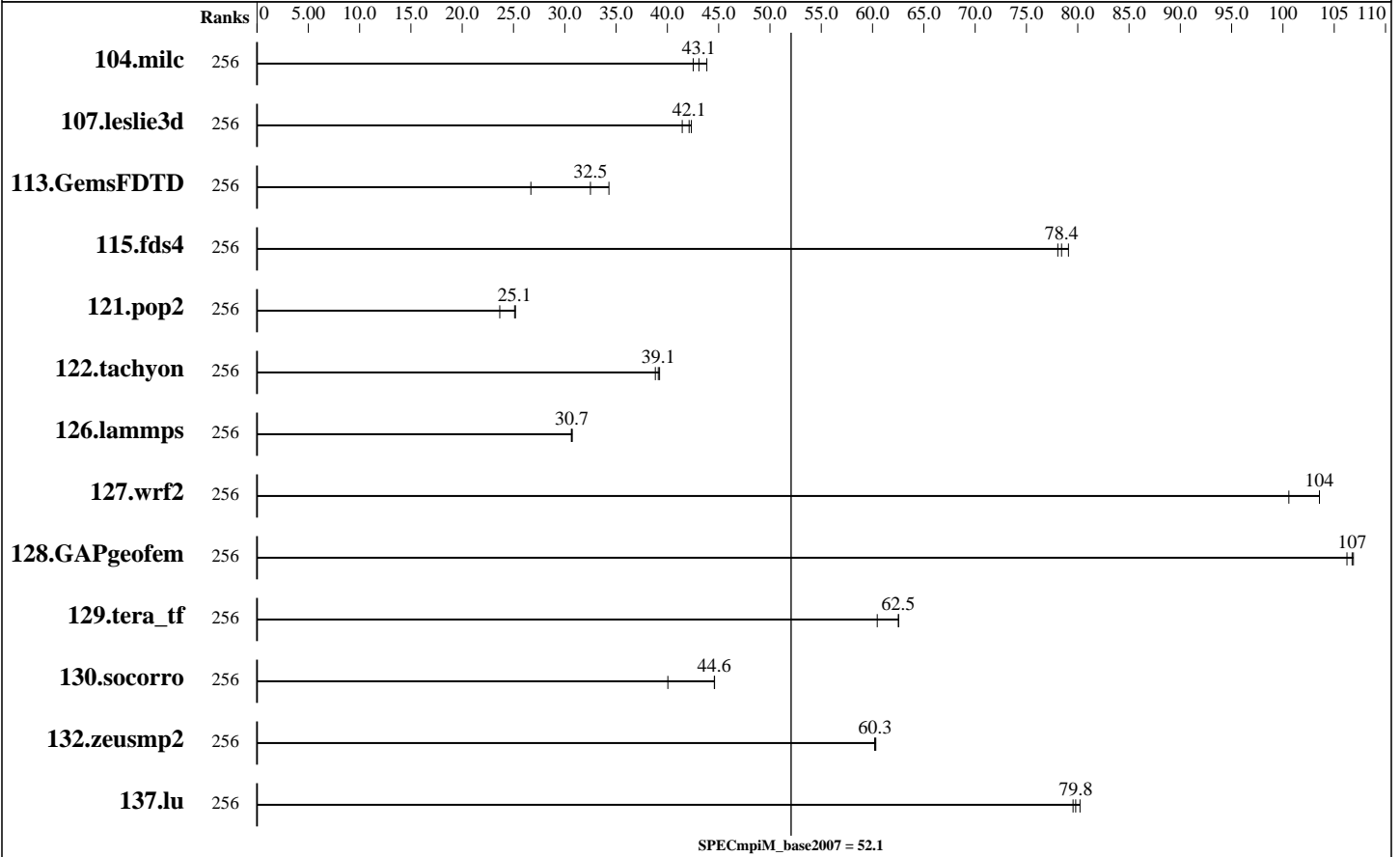
Test sponsor: Lenovo Global Technology

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	256	<u>36.3</u>	<u>43.1</u>	36.8	42.5	35.7	43.8							
107.leslie3d	256	<u>124</u>	<u>42.1</u>	123	42.3	126	41.4							
113.GemsFDTD	256	184	34.3	<u>194</u>	<u>32.5</u>	236	26.7							
115.fds4	256	25.0	78.1	<u>24.9</u>	<u>78.4</u>	24.7	79.1							
121.pop2	256	<u>164</u>	<u>25.1</u>	164	25.2	174	23.7							
122.tachyon	256	<u>71.5</u>	<u>39.1</u>	72.0	38.8	71.3	39.2							
126.lammmps	256	<u>95.0</u>	<u>30.7</u>	94.9	30.7	95.1	30.6							
127.wrf2	256	<u>75.3</u>	<u>104</u>	77.5	101	75.3	104							
128.GAPgeofem	256	<u>19.3</u>	<u>107</u>	19.4	106	19.3	107							
129.tera_tf	256	<u>44.3</u>	<u>62.5</u>	44.3	62.5	45.8	60.5							

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	256	<b>85.6</b>	<b>44.6</b>	85.6	44.6	95.3	40.0							
132.zeusmp2	256	<b>51.5</b>	<b>60.3</b>	51.4	60.3	51.5	60.2							
137.lu	256	45.8	80.2	46.2	79.5	<b>46.1</b>	<b>79.8</b>							

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

#### Software Summary

C Compiler: Intel C Compiler 20.0 for Linux  
 Version 19.1.0.166 Build 20191121  
 C++ Compiler: Intel C++ Compiler 20.0 for Linux  
 Version 19.1.0.166 Build 20191121  
 Fortran Compiler: Intel Fortran Compiler 20.0 for Linux  
 Version 19.1.0.166 Build 20191121  
 Base Pointers: 64-bit  
 Peak Pointers: Not Applicable  
 MPI Library: MPICH MPI Library  
 Version 3.3.2  
 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 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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Hardware Availability: Jun-2020

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

#### Software

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

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

### 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:

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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:

/opt/mpich/m332\_I201\_H47\_R81/bin/mpicc

C++ benchmarks:

126.lammps: /opt/mpich/m332\_I201\_H47\_R81/bin/mpicxx

Fortran benchmarks:

/opt/mpich/m332\_I201\_H47\_R81/bin/mpif90

Benchmarks using both Fortran and C:

/opt/mpich/m332\_I201\_H47\_R81/bin/mpicc  
/opt/mpich/m332\_I201\_H47\_R81/bin/mpif90

## Base Portability Flags

121.pop2: -DSPEC\_MPI\_CASE\_FLAG  
126.lammps: -DMPICH\_IGNORE\_CXX\_SEEK  
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

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

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

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](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](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](mailto:webmaster@spec.org).

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