



# SPEC® MPIL2007 Result

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## Lenovo Global Technology

ThinkSystem SR665  
(AMD EPYC 7763, 2.45 GHz)

SPECmpiL\_peak2007 = 6.52

SPECmpiL\_base2007 = 6.52

MPI2007 license: 28

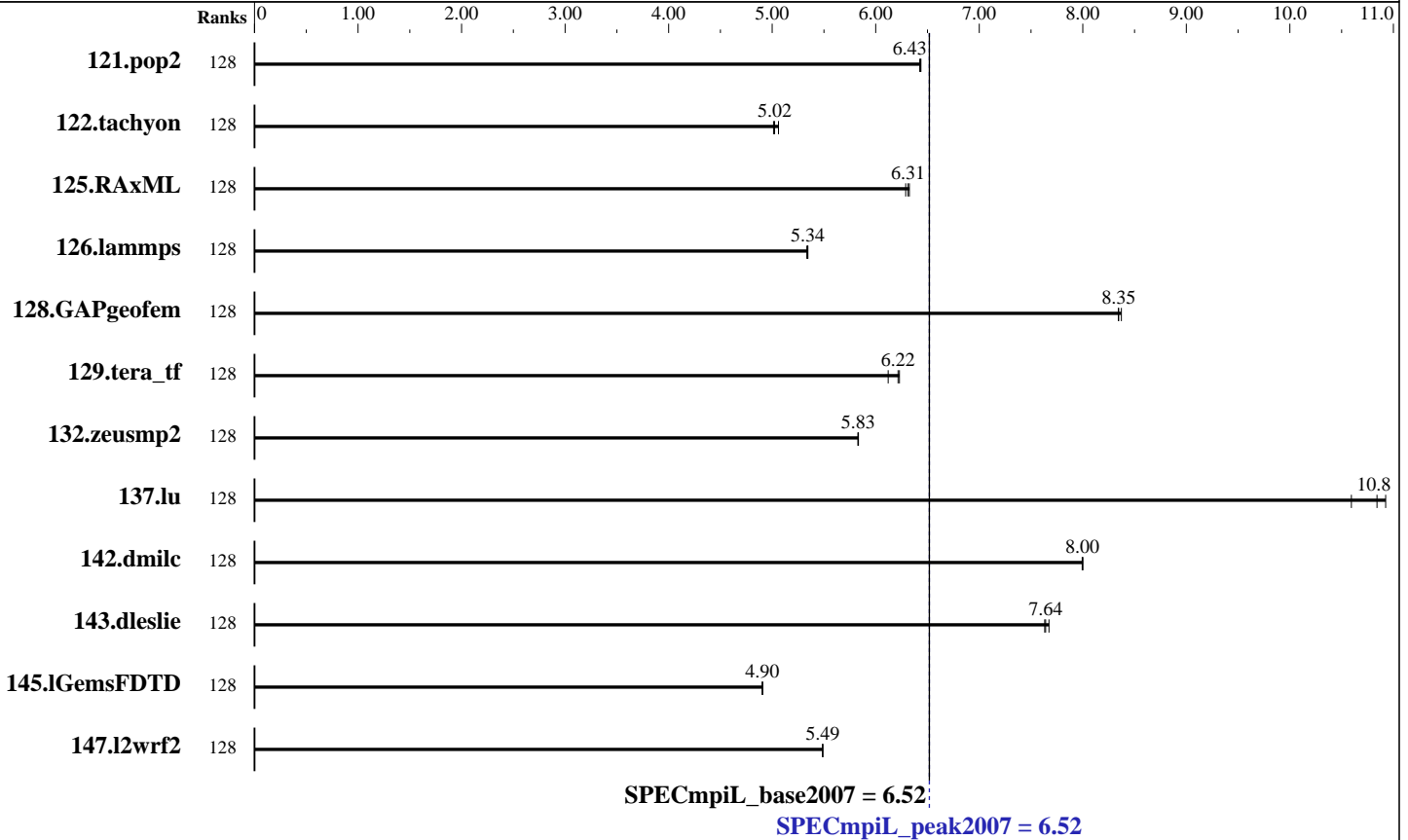
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Mar-2021

Hardware Availability: Mar-2021

Software Availability: Jun-2020



## Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
121.pop2	128	606	6.43	604	6.44	<b>605</b>	<b>6.43</b>	128	606	6.43	604	6.44	<b>605</b>	<b>6.43</b>		
122.tachyon	128	<b>387</b>	<b>5.02</b>	384	5.06	388	5.01	128	<b>387</b>	<b>5.02</b>	384	5.06	388	5.01		
125.RAxML	128	462	6.32	<b>462</b>	<b>6.31</b>	464	6.29	128	462	6.32	<b>462</b>	<b>6.31</b>	464	6.29		
126.lammps	128	460	5.34	<b>460</b>	<b>5.34</b>	461	5.33	128	460	5.34	<b>460</b>	<b>5.34</b>	461	5.33		
128.GAPgeofem	128	709	8.37	<b>711</b>	<b>8.35</b>	711	8.34	128	709	8.37	<b>711</b>	<b>8.35</b>	711	8.34		
129.tera_tf	128	180	6.12	176	6.23	<b>177</b>	<b>6.22</b>	128	180	6.12	176	6.23	<b>177</b>	<b>6.22</b>		
132.zeusmp2	128	363	5.83	364	5.83	<b>364</b>	<b>5.83</b>	128	363	5.83	364	5.83	<b>364</b>	<b>5.83</b>		
137.lu	128	397	10.6	<b>388</b>	<b>10.8</b>	385	10.9	128	397	10.6	<b>388</b>	<b>10.8</b>	385	10.9		
142.dmilc	128	<b>461</b>	<b>8.00</b>	460	8.00	461	7.99	128	<b>461</b>	<b>8.00</b>	460	8.00	461	7.99		
143.dleslie	128	<b>406</b>	<b>7.64</b>	406	7.63	404	7.67	128	<b>406</b>	<b>7.64</b>	406	7.63	404	7.67		
145.lGemsFDTD	128	899	4.90	899	4.91	<b>899</b>	<b>4.90</b>	128	899	4.90	899	4.91	<b>899</b>	<b>4.90</b>		
147.l2wrf2	128	1495	5.49	1495	5.49	<b>1495</b>	<b>5.49</b>	128	1495	5.49	1495	5.49	<b>1495</b>	<b>5.49</b>		

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Standard Performance Evaluation Corporation

info@spec.org

http://www.spec.org/



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Hardware Availability: Mar-2021

Software Availability: Jun-2020

### Hardware Summary

Type of System: Homogeneous  
 Compute Node: ThinkSystem SR665  
 File Server Node: NFS  
 Total Compute Nodes: 1  
 Total Chips: 2  
 Total Cores: 128  
 Total Threads: 128  
 Total Memory: 1 TB  
 Base Ranks Run: 128  
 Minimum Peak Ranks: 128  
 Maximum Peak Ranks: 128

### Software Summary

C Compiler: Intel C++ Compiler 20.2 for Linux  
 Version 19.1.2.254 Build 20200623  
 C++ Compiler: Intel C++ Compiler 20.2 for Linux  
 Version 19.1.2.254 Build 20200623  
 Fortran Compiler: Intel Fortran Compiler 20.2 for Linux  
 Version 19.1.2.254 Build 20200623  
 Base Pointers: 64-bit  
 Peak Pointers: Not Applicable  
 MPI Library: Intel MPI Library for Linux  
 Version 4.1.0  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: ThinkSystem SR665

### Hardware

Number of nodes: 1  
 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  
 Data Rate: 200 Gbs/s  
 Ports Used: 1  
 Interconnect Type: Mellanox ConnectX-6 HDR Infiniband Adapter

### 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: Jun-2020

### 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

### 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,

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## General Notes (Continued)

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

## Base Optimization Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

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

## Peak Optimization Flags

C benchmarks:

122.tachyon: basepeak = yes

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## Peak Optimization Flags (Continued)

125.RAxML: basepeak = yes

142.dmilc: basepeak = yes

C++ benchmarks:

126.lammps: basepeak = yes

Fortran benchmarks:

129.tera\_tf: basepeak = yes

137.lu: basepeak = yes

143.dleslie: basepeak = yes

145.lGemsFDTD: basepeak = yes

Benchmarks using both Fortran and C:

121.pop2: basepeak = yes

128.GAPgeofem: basepeak = yes

132.zeusmp2: basepeak = yes

147.l2wrf2: basepeak = yes

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

[http://www.spec.org/mpi2007/flags/AMD\\_flags.html](http://www.spec.org/mpi2007/flags/AMD_flags.html)

[http://www.spec.org/mpi2007/flags/Lenovo\\_Platform\\_Flags.html](http://www.spec.org/mpi2007/flags/Lenovo_Platform_Flags.html)

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

[http://www.spec.org/mpi2007/flags/AMD\\_flags.xml](http://www.spec.org/mpi2007/flags/AMD_flags.xml)

[http://www.spec.org/mpi2007/flags/Lenovo\\_Platform\\_Flags.xml](http://www.spec.org/mpi2007/flags/Lenovo_Platform_Flags.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).

Tested with SPEC MPI2007 v2.0.1.

Report generated on Mon Mar 15 11:03:02 2021 by SPEC MPI2007 PS/PDF formatter v1463.

Originally published on 15 March 2021.