



SPEC® MPIL2007 Result

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Lenovo Global Technology

ThinkSystem SR655
(AMD EPYC 7763, 2.45 GHz)

SPECmpiL_peak2007 = 6.18

SPECmpiL_base2007 = 6.18

MPI2007 license: 28

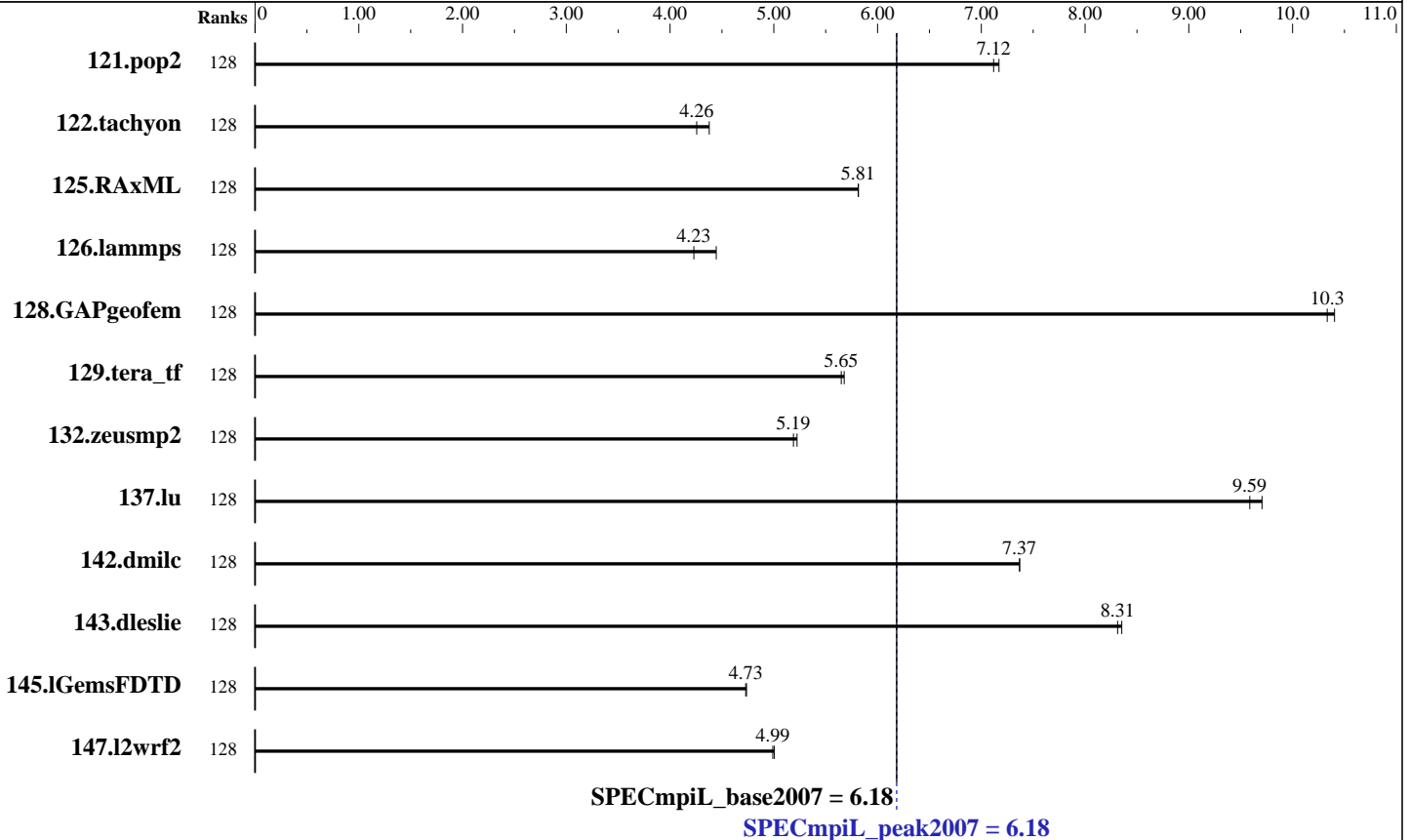
Test sponsor: Lenovo Global Technology

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
121.pop2	128	<u>547</u>	<u>7.12</u>	543	7.17			128	<u>547</u>	<u>7.12</u>	543	7.17		
122.tachyon	128	<u>457</u>	<u>4.26</u>	444	4.38			128	<u>457</u>	<u>4.26</u>	444	4.38		
125.RAxML	128	<u>502</u>	<u>5.81</u>	502	5.82			128	<u>502</u>	<u>5.81</u>	502	5.82		
126.lammps	128	<u>581</u>	<u>4.23</u>	553	4.45			128	<u>581</u>	<u>4.23</u>	553	4.45		
128.GAPgeofem	128	570	10.4	<u>574</u>	<u>10.3</u>			128	570	10.4	<u>574</u>	<u>10.3</u>		
129.tera_tf	128	194	5.68	<u>195</u>	<u>5.65</u>			128	194	5.68	<u>195</u>	<u>5.65</u>		
132.zeusmp2	128	406	5.22	<u>409</u>	<u>5.19</u>			128	406	5.22	<u>409</u>	<u>5.19</u>		
137.lu	128	<u>438</u>	<u>9.59</u>	433	9.71			128	<u>438</u>	<u>9.59</u>	433	9.71		
142.dmilc	128	500	7.37	<u>500</u>	<u>7.37</u>			128	500	7.37	<u>500</u>	<u>7.37</u>		
143.dleslie	128	371	8.35	<u>373</u>	<u>8.31</u>			128	371	8.35	<u>373</u>	<u>8.31</u>		
145.lGemsFDTD	128	<u>933</u>	<u>4.73</u>	931	4.74			128	<u>933</u>	<u>4.73</u>	931	4.74		
147.l2wrf2	128	1639	5.01	<u>1644</u>	<u>4.99</u>			128	1639	5.01	<u>1644</u>	<u>4.99</u>		

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

Standard Performance Evaluation Corporation

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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
 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-2021

Node Description: NFS

Hardware		Software	
Number of nodes:	1	Adapter:	Mellanox ConnectX-6 HDR Infiniband
Uses of the node:	Fileserver	Adapter Driver:	5.2-1.0.4
Vendor:	Lenovo Global Technology	Adapter Firmware:	20.25.2006
Model:	ThinkSystem SR655	Operating System:	Red Hat Enterprise Linux Server release 8.3
CPU Name:	AMD EPYC 7763 CPU	Local File System:	None
CPU(s) orderable:	1 chips	Shared File System:	NFS
Chips enabled:	1	System State:	Multi-User, run level 3
Cores enabled:	64	Other Software:	None
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		

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		
Primary Use:	MPI Traffic		

Submit Notes

The config file option 'submit' was used.



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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

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

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Base Optimization Flags (Continued)

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:

122.tachyon: basepeak = yes

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/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.

Tested with SPEC MPI2007 v2.0.1.
Report generated on Tue Jun 8 10:02:13 2021 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 8 June 2021.