SPEC® MPIL2007 Result

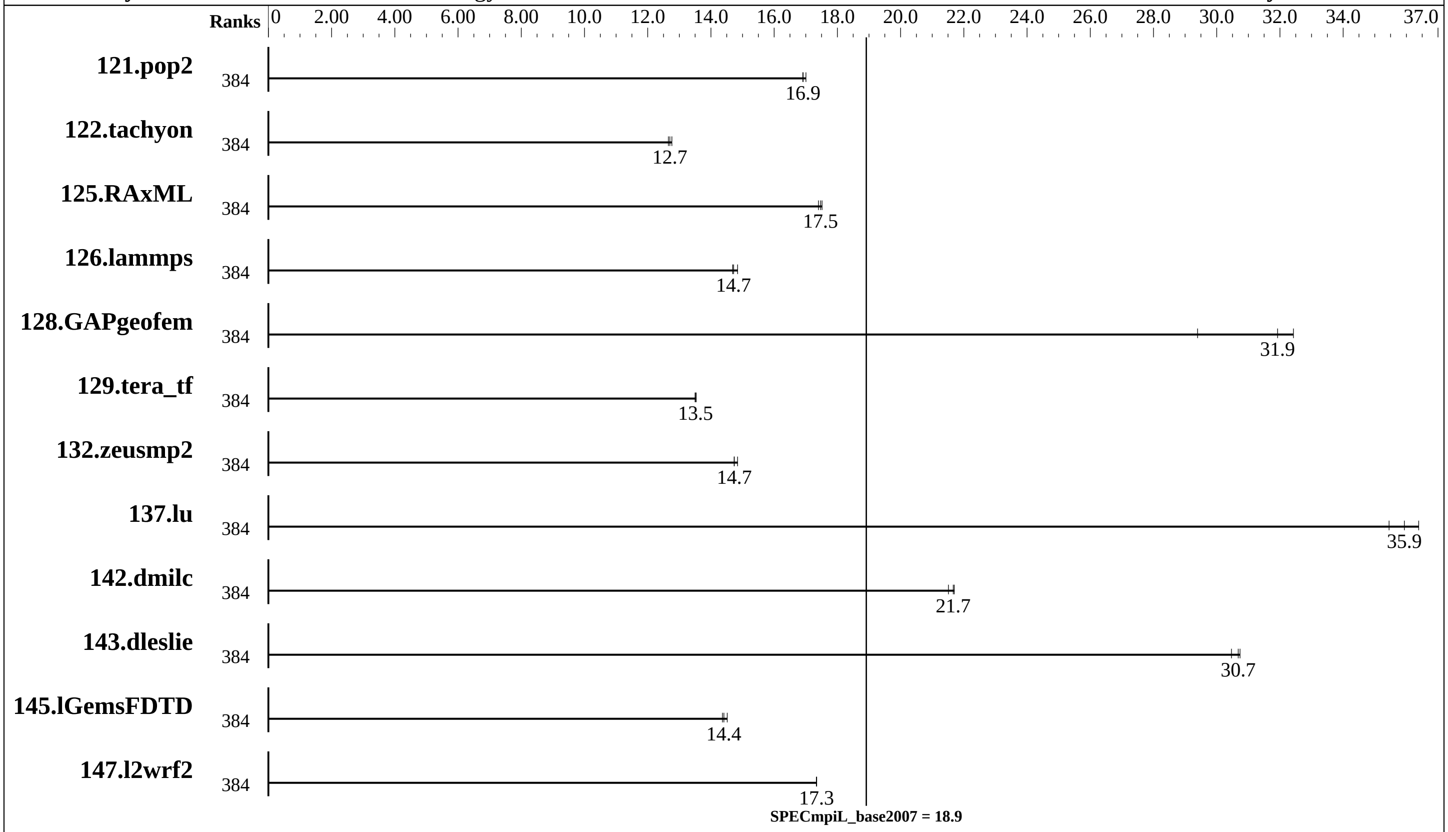
Lenovo Global Technology

ThinkSystem SR665
(AMD EPYC 7H12, 2.6 GHz)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 18.9

MPI2007 license: 28 | **Test date:** Jan-2020
Test sponsor: Lenovo Global Technology | **Hardware Availability:** Jun-2020
Tested by: Lenovo Global Technology | **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	384	229	17.0	**230**	**16.9**	230	16.9							
122.tachyon	384	**153**	**12.7**	152	12.8	154	12.7							
125.RAxML	384	**167**	**17.5**	168	17.4	167	17.5							
126.lammps	384	166	14.8	**167**	**14.7**	167	14.7							
128.GAPgeofem	384	183	32.4	202	29.4	**186**	**31.9**							
129.tera_tf	384	81.2	13.5	**81.3**	**13.5**	81.4	13.5							
132.zeusmp2	384	144	14.7	**144**	**14.7**	143	14.8							
137.lu	384	119	35.5	**117**	**35.9**	115	36.4							
142.dmilc	384	170	21.7	171	21.5	**170**	**21.7**							
143.dleslie	384	102	30.5	**101**	**30.7**	101	30.7							
145.lGemsFDTD	384	**306**	**14.4**	304	14.5	307	14.4							
147.l2wrf2	384	**473**	**17.3**	473	17.3	473	17.3							

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

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Hardware Summary

Type of System:	Homogeneous
Compute Node:	ThinkSystem SR665
Interconnect:	Mellanox ConnectX-6 HDR
File Server Node:	NFS
Total Compute Nodes:	3
Total Chips:	6
Total Cores:	384
Total Threads:	384
Total Memory:	3 TB
Base Ranks Run:	384
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:	Open MPI Library Version 4.0.2
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: ThinkSystem SR665

Hardware

Number of nodes:	3
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
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:	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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Test sponsor: Lenovo Global Technology **Hardware Availability:** Jun-2020
Tested by: Lenovo Global Technology **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 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
Primary Use:	MPI Traffic

Software

Submit Notes

The config file option 'submit' was used.

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Software Availability: Jun-2020

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/OMPI/O402_I20_H47_R81/bin/mpicc

C++ benchmarks:

126.lammps: /opt/OMPI/O402_I20_H47_R81/bin/mpicxx

Fortran benchmarks:
/opt/OMPI/O402_I20_H47_R81/bin/mpif90

Benchmarks using both Fortran and C:
/opt/OMPI/O402_I20_H47_R81/bin/mpicc
/opt/OMPI/O402_I20_H47_R81/bin/mpif90

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

Continued on next page

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`

The flags file that was used to format this result can be browsed at
http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20200506.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20200506.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC MPI2007 v2.0.1.
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