SPEC® MPIL2007 Result

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Lenovo Global Technology

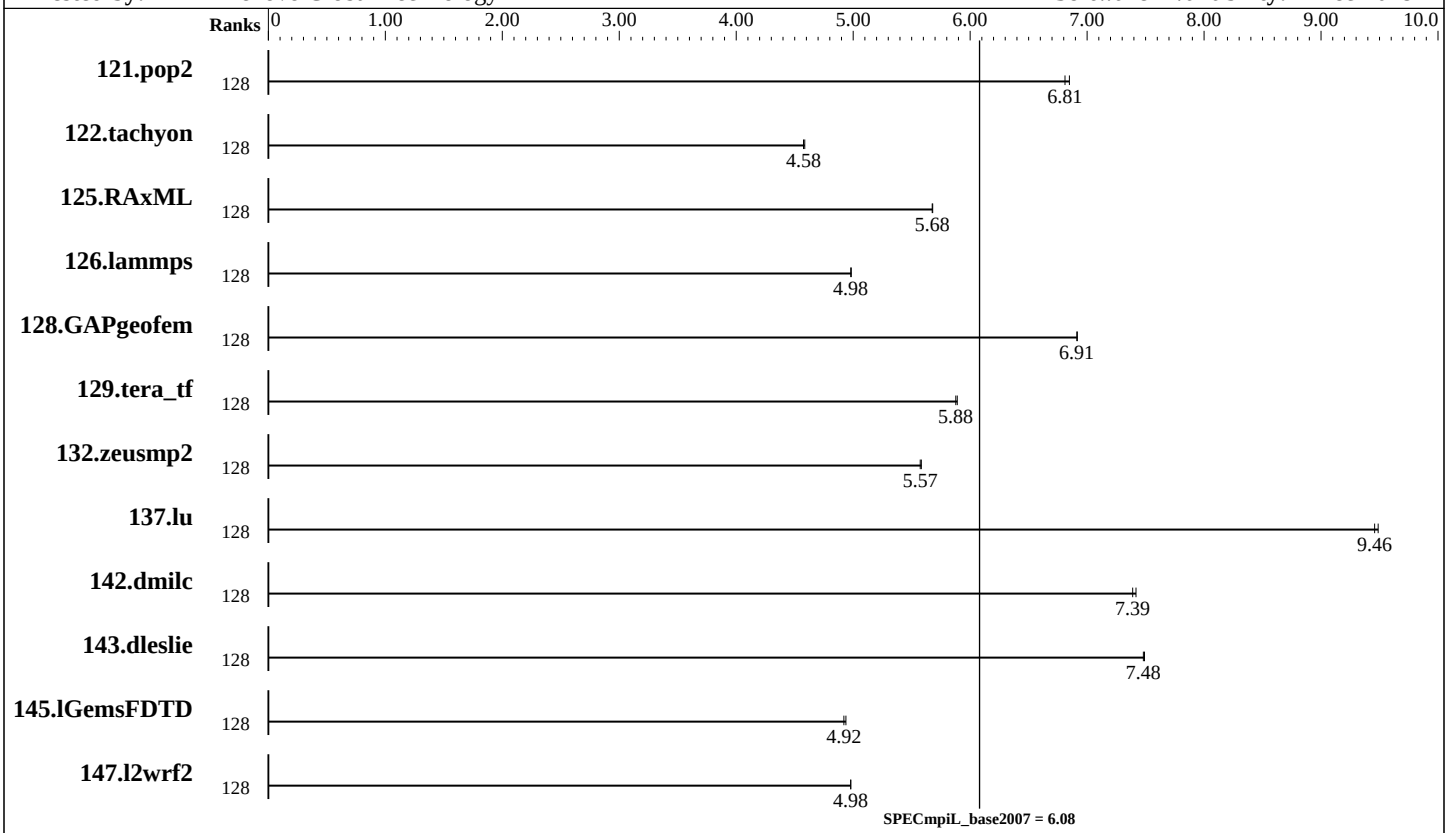
ThinkSystem SR655
(AMD EPYC 7H12 CPU, 2.6 GHz)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 6.08

MPI2007 license: 28
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Jan-2020
Hardware Availability: Jun-2020
Software Availability: Dec-2018



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	128	**571**	**6.81**	568	6.85									
122.tachyon	128	**425**	**4.58**	424	4.59									
125.RAxML	128	**514**	**5.68**	514	5.68									
126.lammps	128	493	4.98	**494**	**4.98**									
128.GAPgeofem	128	**859**	**6.91**	858	6.92									
129.tera_tf	128	187	5.89	**187**	**5.88**									
132.zeusmp2	128	**380**	**5.57**	380	5.58									
137.lu	128	**444**	**9.46**	443	9.49									
142.dmilc	128	497	7.42	**499**	**7.39**									
143.dleslie	128	414	7.49	**414**	**7.48**									
145.lGemsFDTD	128	893	4.94	**896**	**4.92**									
147.l2wrf2	128	1648	4.98	**1648**	**4.98**									

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 SR655
Interconnect:	Mellanox ConnectX-6 HDR Infiniband
File Server Node:	NFS
Total Compute Nodes:	2
Total Chips:	2
Total Cores:	128
Total Threads:	256
Total Memory:	512 GB
Base Ranks Run:	128
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 SR655

Hardware

Number of nodes:	2
Uses of the node:	compute
Vendor:	Lenovo Global Technology
Model:	SR655
CPU Name:	AMD EPYC 7H12 CPU
CPU(s) orderable:	1 chip
Chips enabled:	1
Cores enabled:	64
Cores per chip:	128
Threads per core:	2
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:	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:	200G
Ports Used:	1
Interconnect Type:	Mellanox ConnectX-6 HDR Infiniband VPI Adapter

Software

Adapter:	Mellanox ConnectX-6 HDR Infiniband
Adapter Driver:	4.7-1.0.0.1.2
Adapter Firmware:	None
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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MPI2007 license: 28
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Jan-2020
Hardware Availability: Jun-2020
Software Availability: Dec-2018

Node Description: NFS

Hardware

Number of nodes:	1
Uses of the node:	Fileserver
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR655
CPU Name:	AMD EPYC 7H12 CPU
CPU(s) orderable:	1 chip
Chips enabled:	1
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:	512 GB (16 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 PCIe 4.0 x16
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 PCIe 4.0 x16
Adapter Driver:	4.7-1.0.0.1.2
Adapter Firmware:	None
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 Infiniband

Hardware

Vendor:	Mellanox
Model:	Mellanox ConnectX-6 HDR Infiniband
Switch Model:	None
Number of Switches:	0
Number of Ports:	0
Data Rate:	None
Firmware:	None
Topology:	Direct Attach
Primary Use:	MPI Traffic

Software

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/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 -std=c11`

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.20200408.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20200408.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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