SPEC® MPIL2007 Result

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Lenovo Global Technology

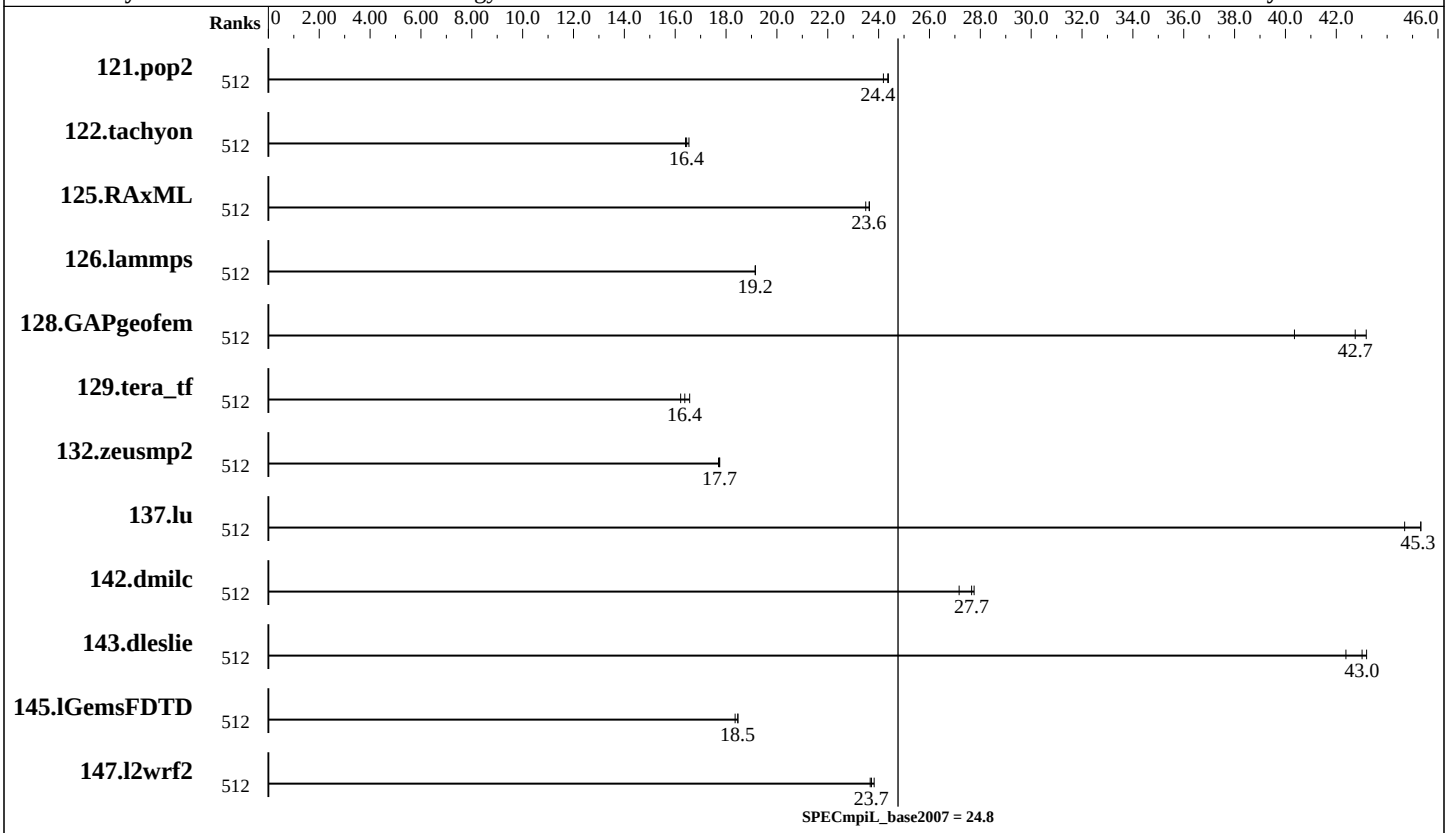
ThinkSystem SR665
(AMD EPYC 7H12, 2.6 GHz)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 24.8

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
121.pop2	512	**160**	**24.4**	161	24.2	160	24.4							
122.tachyon	512	118	16.5	118	16.4	**118**	**16.4**							
125.RAxML	512	123	23.6	124	23.5	**124**	**23.6**							
126.lammps	512	128	19.2	128	19.2	**128**	**19.2**							
128.GAPgeofem	512	137	43.2	147	40.4	**139**	**42.7**							
129.tera_tf	512	66.3	16.6	**67.1**	**16.4**	67.8	16.2							
132.zeusmp2	512	**119**	**17.7**	120	17.7	119	17.7							
137.lu	512	94.0	44.7	**92.7**	**45.3**	92.7	45.3							
142.dmilc	512	**133**	**27.7**	136	27.2	133	27.8							
143.dleslie	512	71.8	43.2	**72.1**	**43.0**	73.1	42.4							
145.lGemsFDTD	512	240	18.4	**239**	**18.5**	239	18.5							
147.l2wrf2	512	344	23.8	347	23.7	**346**	**23.7**							

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

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Software Availability: Jun-2020

Hardware Summary

Type of System:	Homogeneous
Compute Node:	ThinkSystem SR665
Interconnect:	Mellanox ConnectX-6 HDR
File Server Node:	NFS
Total Compute Nodes:	4
Total Chips:	8
Total Cores:	512
Total Threads:	512
Total Memory:	4 TB
Base Ranks Run:	512
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:	4
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

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.
```

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`

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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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