



SPEC® MPIL2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
(AMD EPYC 7H12, 2.6 GHz)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 29.1

MPI2007 license: 28

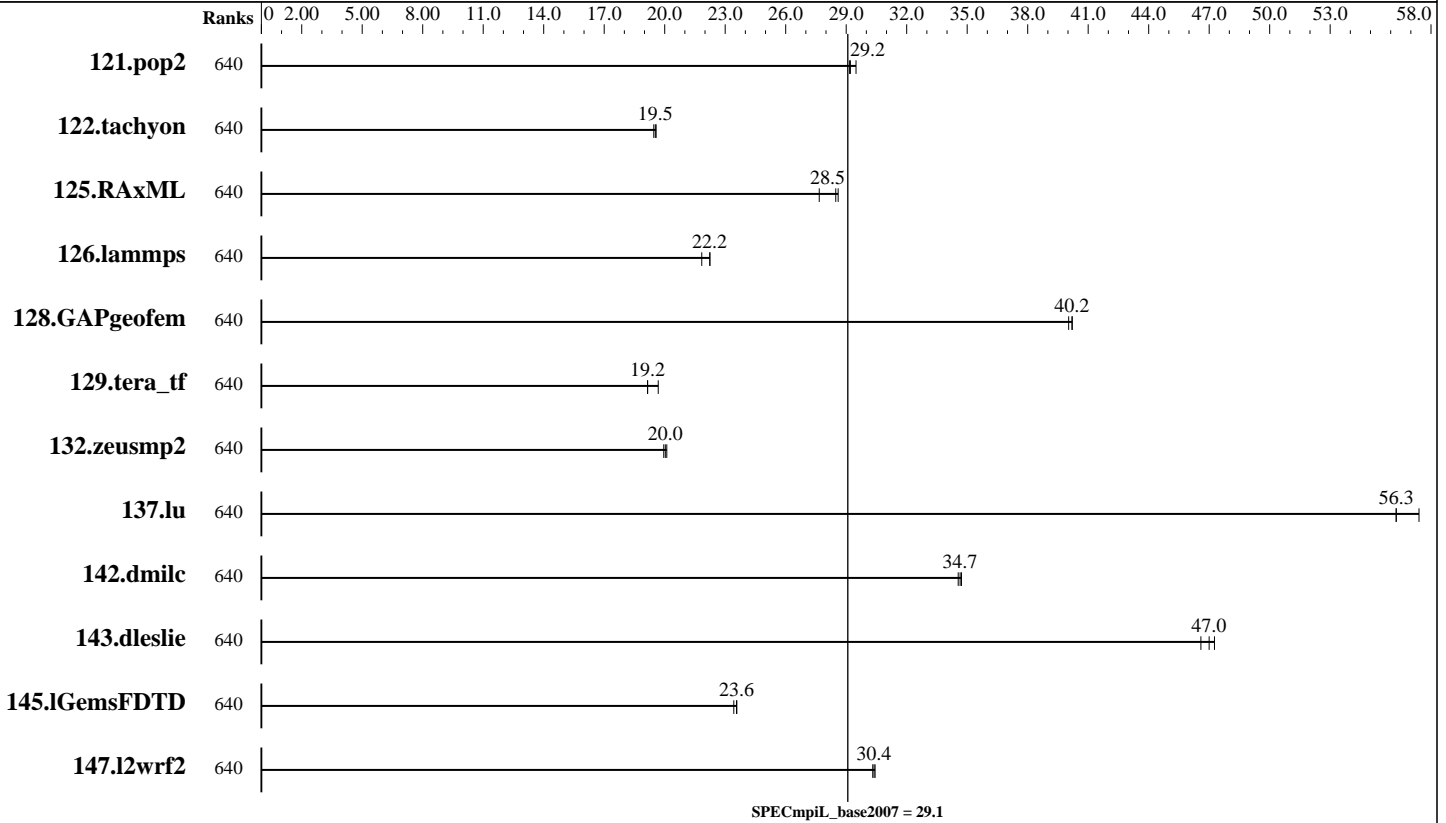
Test sponsor: Lenovo Global Technology

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	640	133	<u>29.2</u>	132	29.5	133	29.2							
122.tachyon	640	99.9	19.5	99.3	19.6	99.5	19.5							
125.RAxML	640	102	28.6	106	27.7	102	28.5							
126.lammps	640	113	21.8	111	22.2	111	22.2							
128.GAPgeofem	640	148	40.2	148	40.2	148	40.0							
129.tera_tf	640	57.4	19.1	57.4	19.2	55.8	19.7							
132.zeusmp2	640	106	20.0	105	20.1	106	20.0							
137.lu	640	73.2	57.4	74.7	56.3	74.7	56.3							
142.dmilc	640	106	34.7	107	34.6	106	34.7							
143.dleslie	640	65.6	47.3	66.5	46.6	66.0	47.0							
145.lGemsFDTD	640	187	23.6	188	23.4	187	23.6							
147.l2wrf2	640	270	30.4	270	30.4	271	30.3							

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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http://www.spec.org/



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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: 5
 Total Chips: 10
 Total Cores: 640
 Total Threads: 640
 Total Memory: 5 TB
 Base Ranks Run: 640
 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: 5
 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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Node Description: NFS

Hardware		Software	
Number of nodes:	1	Adapter:	Mellanox ConnectX-6 HDR Infiniband
Uses of the node:	Fileserver	Adapter Driver:	4.7-1.0.0.1.2
Vendor:	Lenovo Global Technology	Adapter Firmware:	20.25.2006
Model:	ThinkSystem SR665	Operating System:	Red Hat Enterprise Linux Server release 8.1
CPU Name:	AMD EPYC 7H12 CPU	Local File System:	None
CPU(s) orderable:	1-2 chips	Shared File System:	NFS
Chips enabled:	2	System State:	Multi-User, run level 3
Cores enabled:	128	Other Software:	None
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		

Interconnect Description: Mellanox ConnectX-6 HDR

Hardware		Software	
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		

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): 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

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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

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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