SPEC® MPIM2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Lenovo Global Technology

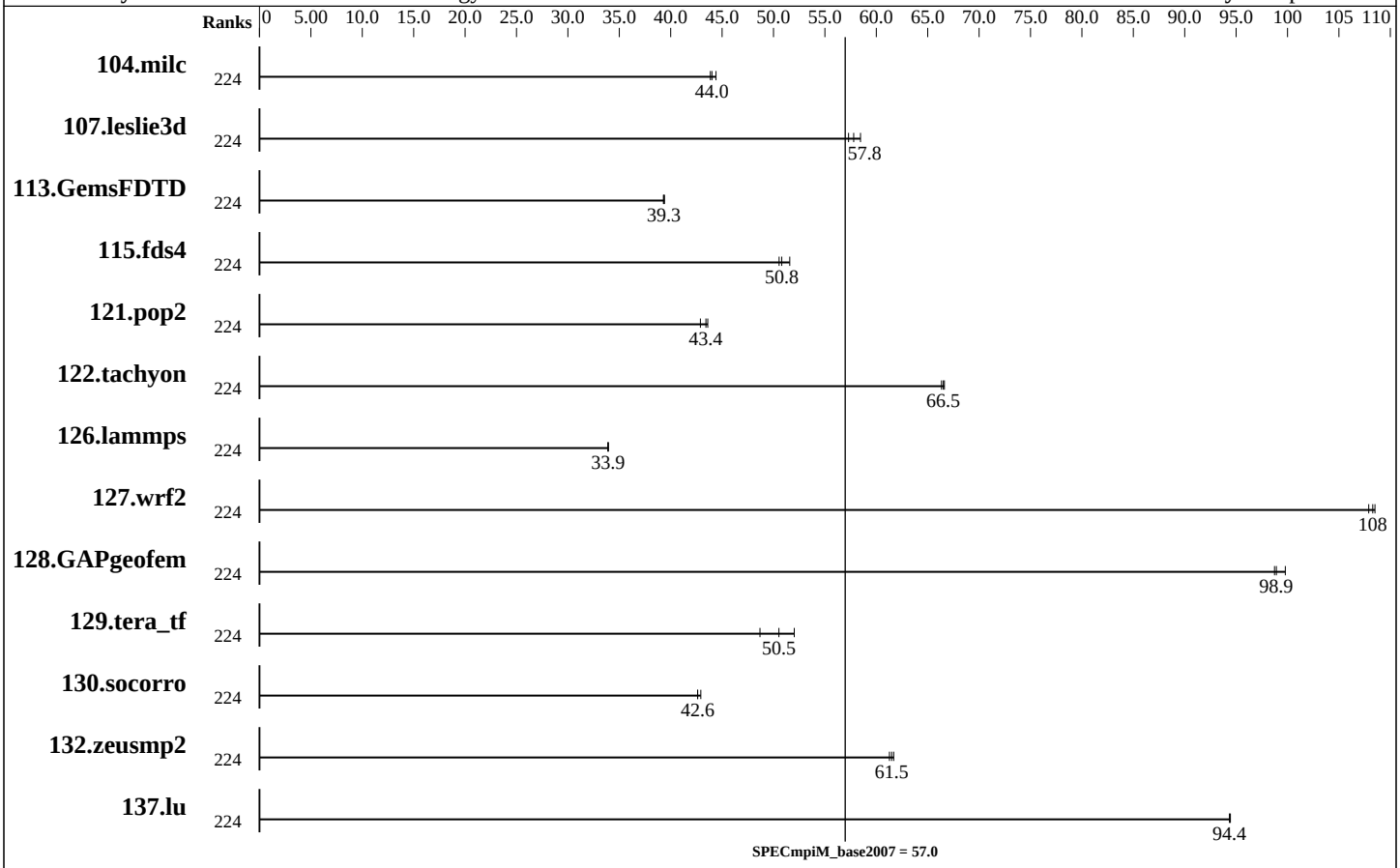
ThinkSystem SR650
(Intel Xeon Platinum 8280 CPU, 2.70 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 57.0

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

Test date: Mar-2019
Hardware Availability: Apr-2019
Software Availability: Apr-2019



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	224	**35.6**	**44.0**	35.2	44.4	35.7	43.9							
107.leslie3d	224	89.3	58.5	**90.3**	**57.8**	91.1	57.3							
113.GemsFDTD	224	160	39.4	**160**	**39.3**	161	39.3							
115.fds4	224	38.6	50.5	37.8	51.6	**38.4**	**50.8**							
121.pop2	224	94.7	43.6	**95.1**	**43.4**	96.2	42.9							
122.tachyon	224	42.2	66.3	**42.0**	**66.5**	42.0	66.6							
126.lammps	224	85.9	33.9	**86.0**	**33.9**	86.0	33.9							
127.wrf2	224	71.8	109	72.3	108	**72.0**	**108**							
128.GAPgeofem	224	20.7	99.8	20.9	98.7	**20.9**	**98.9**							
129.tera_tf	224	56.9	48.7	**54.8**	**50.5**	53.2	52.0							

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	224	**89.6**	**42.6**	88.9	42.9	89.6	42.6							
132.zeusmp2	224	50.3	61.7	**50.5**	**61.5**	50.6	61.3							
137.lu	224	**39.0**	**94.4**	39.0	94.4	38.9	94.4							

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

Hardware Summary

Type of System: Homogeneous
Compute Node: ThinkSystem SR650
Interconnect: Intel Omni-Path
File Server Node: NFS
Total Compute Nodes: 4
Total Chips: 8
Total Cores: 224
Total Threads: 224
Total Memory: 3 TB
Base Ranks Run: 224
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C++ Compiler 17.0 Update 7 for Linux Version 17.0.7 Build 20180403
C++ Compiler: Intel C++ Compiler 17.0 Update 7 for Linux Version 17.0.7 Build 20180403
Fortran Compiler: Intel Fortran Compiler 17.0 Update 7 for Linux Version 17.0.7 Build 20180403
Base Pointers: 64-bit
Peak Pointers: Not Applicable
MPI Library: Intel MPI Library for Linux* OS Version 2018 Update 3 Build 20180411
Other MPI Info: None
Pre-processors: No
Other Software: None

Node Description: ThinkSystem SR650

Hardware

Number of nodes: 4
Uses of the node: compute
Vendor: Lenovo Global Technology
Model: SR650
CPU Name: Intel Xeon Platinum 8280
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 56
Cores per chip: 28
Threads per core: 1
CPU Characteristics: None
CPU MHz: 2700
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core
L3 Cache: 38.5 MB I+D on chip per chip
Other Cache: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
Disk Subsystem: 1 x 1 TB 12 Gbps SAS 2.5" SSD (JBOD)
Other Hardware: ThinkSystem RAID 530-8i 2GB Flash
Adapter: Intel Omni-Path 100 Series Single-port PCIe 3.0 x16 HFA
Number of Adapters: 1
Slot Type: PCI-Express Gen3 x16
Data Rate: 100 Gb/s

Continued on next page

Software

Adapter: Intel Omni-Path 100 Series Single-port PCIe 3.0 x16 HFA
Adapter Driver: IFS 10.9.1.0.15
Adapter Firmware: 10.9.0.1.0
Operating System: Red Hat Enterprise Linux Server release 7.6, Kernel 3.10.0-957.el7.x86_64
Local File System: xfs
Shared File System: nfs
System State: Multi-user, run level 3
Other Software: NONE

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Test date: Mar-2019
Hardware Availability: Apr-2019
Software Availability: Apr-2019

Node Description: ThinkSystem SR650

Ports Used:	1
Interconnect Type:	Intel Omni-Path Fabric 100 Series

Node Description: NFS

Hardware

Number of nodes:	1
Uses of the node:	Fileserver
Vendor:	Lenovo Global Technology
Model:	ThinkSystem SR650
CPU Name:	Intel Xeon Platinum 8280
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	56
Cores per chip:	28
Threads per core:	1
CPU Characteristics:	None
CPU MHz:	2700
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	38.5 MB I+D on chip per chip
Other Cache:	None
Memory:	768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
Disk Subsystem:	1 x 1 TB 12 Gbps SAS 2.5" SSD (JBOD)
Other Hardware:	None
Adapter:	Intel Omni-Path 100 Series Single-port PCIe 3.0 x16 HFA
Number of Adapters:	1
Slot Type:	PCI-Express 3.0 x16
Data Rate:	100 Gb/s
Ports Used:	1
Interconnect Type:	Intel Omni-Path Fabric 100 series

Software

Adapter:	Intel Omni-Path 100 Series Single-port PCIe 3.0 x16 HFA
Adapter Driver:	10.9.1.0.15
Adapter Firmware:	10.9.0.1.0
Operating System:	Red Hat Enterprise Linux Server release 7.6
Local File System:	None
Shared File System:	NFS
System State:	Multi-User, run level 3
Other Software:	None

Interconnect Description: Intel Omni-Path

Hardware

Vendor:	Intel
Model:	Intel Omni-Path Fabric 100 Series
Switch Model:	Intel Omni-Path Edge Switch 100 Series 48 Port 2 PSU
Number of Switches:	1
Number of Ports:	48
Data Rate:	100 Gb/s
Firmware:	10.3.0.0.60
Topology:	Mesh
Primary Use:	MPI Traffic

Software

Submit Notes

```
The config file option 'submit' was used.
```

General Notes

```
130.socorro (base): "nullify_ptrs" src.alt was used.

129.tera_tf (base): "add_rank_support" src.alt was used.

 MPI startup command:
   mpiexec command was used to start MPI jobs.

 RAM configuration:
   Compute nodes have 2 x 32 GB RDIMM on each memory channel.

 BIOS settings:
   Operating Mode : Maximum Performance Mode
   Intel Hyper-Threading Technology (SMT): Disabled
   SNC (Sub-NUMA Cluster): Enable


 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`
127.wrf2: `-DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX`
130.socorro: `-assume nostd_intent_in`

Base Optimization Flags

C benchmarks:
`-O3 -ipo -xCORE-AVX512 -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -ipo -xCORE-AVX512 -no-prec-div`

Fortran benchmarks:
`-O3 -ipo -xCORE-AVX512 -no-prec-div`

Benchmarks using both Fortran and C:
`-O3 -ipo -xCORE-AVX512 -no-prec-div`

The flags files that were used to format this result can be browsed at
http://www.spec.org/mpi2007/flags/Lenovo-SPECmpiM_Platform_Flags.html
http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20170711.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/mpi2007/flags/Lenovo-SPECmpiM_Platform_Flags.xml
http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20170711.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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