



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

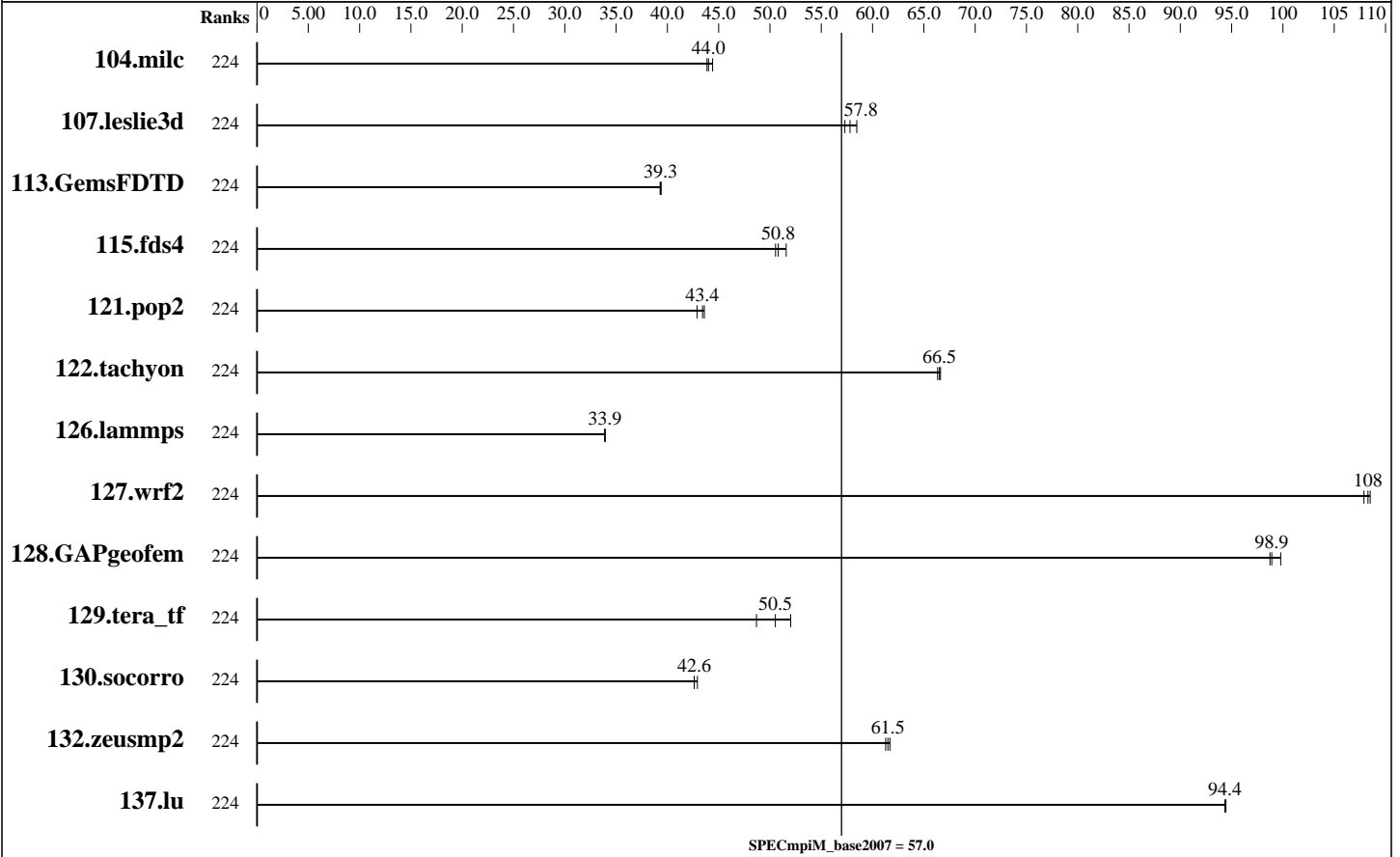
Test sponsor: Lenovo Global Technology

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	<u>35.6</u>	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

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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Tested by: Lenovo Global Technology

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



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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



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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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