



SPEC® MPIL2007 Result

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Hewlett Packard Enterprise

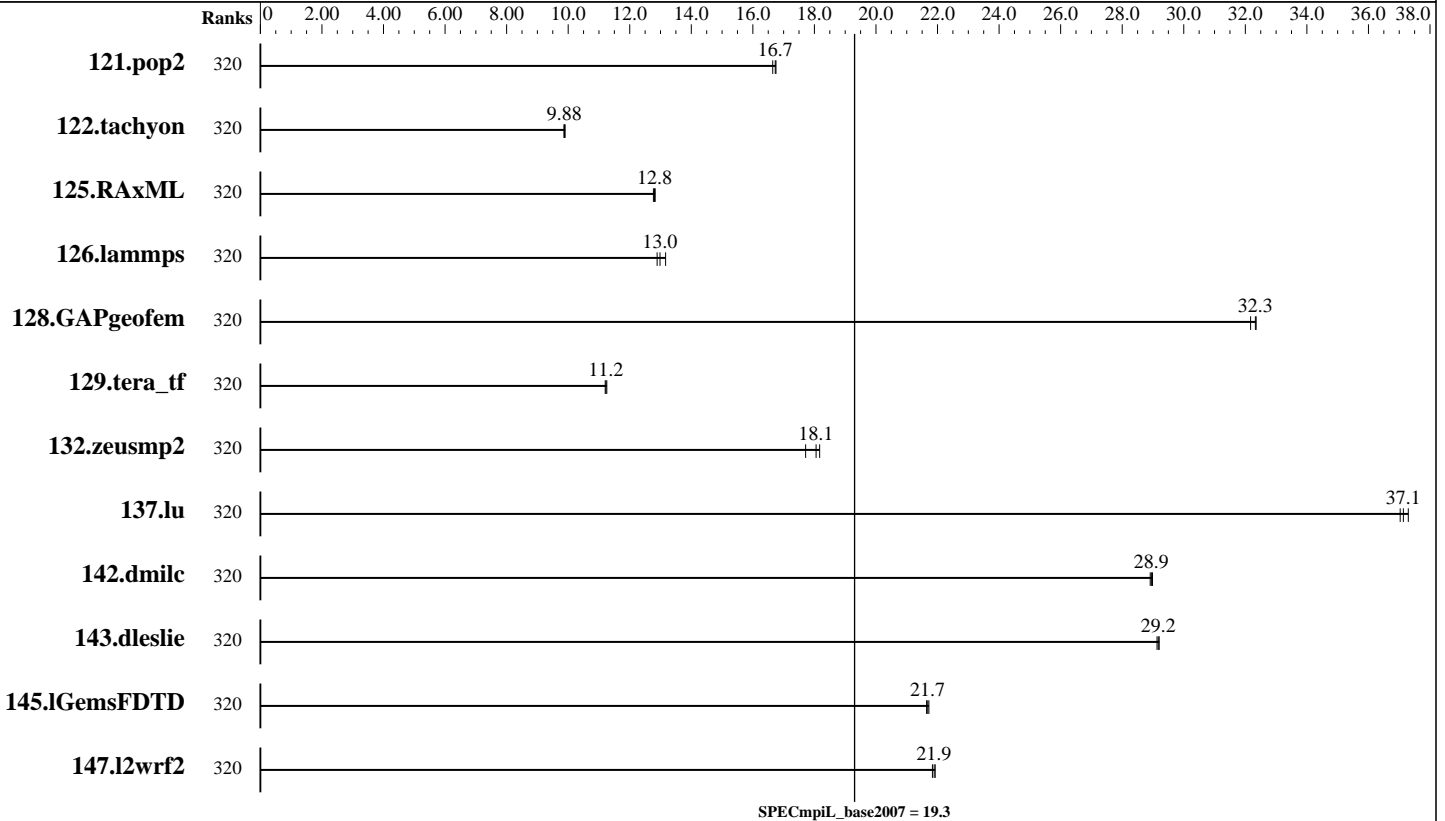
SPECmpiL_peak2007 = Not Run

SGI 8600
(Intel Xeon Gold 6148, 2.40 GHz)

SPECmpiL_base2007 = 19.3

MPI2007 license: 1
Test sponsor: HPE
Tested by: HPE

Test date: Oct-2017
Hardware Availability: Jul-2017
Software Availability: Nov-2017



Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
121.pop2	320	234	16.6	<u>233</u>	<u>16.7</u>	232	16.8									
122.tachyon	320	196	9.90	<u>197</u>	<u>9.88</u>	197	9.86									
125.RAxML	320	229	12.8	228	12.8	<u>228</u>	<u>12.8</u>									
126.lammps	320	<u>189</u>	<u>13.0</u>	187	13.2	191	12.9									
128.GAPgeofem	320	184	32.2	183	32.4	<u>184</u>	<u>32.3</u>									
129.tera_tf	320	<u>97.9</u>	<u>11.2</u>	98.1	11.2	97.6	11.3									
132.zeusmp2	320	<u>117</u>	<u>18.1</u>	117	18.2	120	17.7									
137.lu	320	<u>113</u>	<u>37.1</u>	113	37.0	113	37.3									
142.dmilc	320	<u>127</u>	<u>28.9</u>	127	29.0	127	28.9									
143.dleslie	320	106	29.1	<u>106</u>	<u>29.2</u>	106	29.2									
145.lGemsFDTD	320	<u>203</u>	<u>21.7</u>	203	21.7	204	21.6									
147.l2wrf2	320	374	21.9	<u>375</u>	<u>21.9</u>	376	21.8									

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: HPE XA730i Gen10 Server Node
Interconnect: InfiniBand (MPI and I/O)
File Server Node: Lustre FS
Total Compute Nodes: 8
Total Chips: 16
Total Cores: 320
Total Threads: 640
Total Memory: 1536 GB
Base Ranks Run: 320
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C Composer XE for Linux, Version 18.0.0.128 Build 20170811
C++ Compiler: Intel C++ Composer XE for Linux, Version 18.0.0.128 Build 20170811
Fortran Compiler: Intel Fortran Composer XE for Linux, Version 18.0.0.128 Build 20170811
Base Pointers: 64-bit
Peak Pointers: Not Applicable
MPI Library: HPE Performance Software - Message Passing Interface 2.17
Other MPI Info: OFED 3.2.2
Pre-processors: None
Other Software: None

Node Description: HPE XA730i Gen10 Server Node

Hardware

Number of nodes: 8
Uses of the node: compute
Vendor: Hewlett Packard Enterprise
Model: SGI 8600 (Intel Xeon Gold 6148, 2.40 GHz)
CPU Name: Intel Xeon Gold 6148
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 40
Cores per chip: 20
Threads per core: 2
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 2400
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core
L3 Cache: 27.5 MB I+D on chip per chip
Other Cache: None
Memory: 192 GB (12 x 16 GB 2Rx4 PC4-2666V-R)
Disk Subsystem: None
Other Hardware: None
Adapter: Mellanox MT27700 with ConnectX-4 ASIC
Number of Adapters: 2
Slot Type: PCIe x16 Gen3 8GT/s
Data Rate: InfiniBand 4X EDR
Ports Used: 1
Interconnect Type: InfiniBand

Software

Adapter: Mellanox MT27700 with ConnectX-4 ASIC
Adapter Driver: OFED-3.4-2.1.8.0
Adapter Firmware: 12.18.1000
Operating System: Red Hat Enterprise Linux Server 7.3 (Maipo), Kernel 3.10.0-514.2.2.el7.x86_64
Local File System: LFS
Shared File System: LFS
System State: Multi-user, run level 3
Other Software: SGI Management Center Compute Node 3.5.0, Build 716r171.rhel73-1705051353

Node Description: Lustre FS

Hardware

Number of nodes: 4
Uses of the node: fileserver

Software

Adapter: Mellanox MT27700 with ConnectX-4 ASIC
Adapter Driver: OFED-3.3-1.0.0.0

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Node Description: Lustre FS

Vendor: Hewlett Packard Enterprise
 Model: Rackable C1104-GP2 (Intel Xeon E5-2690 v3, 2.60 GHz)
 CPU Name: Intel Xeon E5-2690 v3
 CPU(s) orderable: 1-2 chips
 Chips enabled: 2
 Cores enabled: 24
 Cores per chip: 12
 Threads per core: 1
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
 Hyper-Threading Technology disabled
 CPU MHz: 2600
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 30 MB I+D on chip per chip
 Other Cache: None
 Memory: 128 GB (8 x 16 GB 2Rx4 PC4-2133P-R)
 Disk Subsystem: 684 TB RAID 6
 48 x 8+2 2TB 7200 RPM
 Other Hardware: None
 Adapter: Mellanox MT27700 with ConnectX-4 ASIC
 Number of Adapters: 2
 Slot Type: PCIe x16 Gen3
 Data Rate: InfiniBand 4X EDR
 Ports Used: 1
 Interconnect Type: InfiniBand

Adapter Firmware: 12.14.2036
 Operating System: Red Hat Enterprise Linux Server 7.3 (Maipo),
 Kernel 3.10.0-514.2.2.el7.x86_64
 Local File System: ext3
 Shared File System: LFS
 System State: Multi-user, run level 3
 Other Software: None

Interconnect Description: InfiniBand (MPI and I/O)

Hardware
 Vendor: Mellanox Technologies and SGI
 Model: SGI P0002145
 Switch Model: SGI P0002145
 Number of Switches: 1
 Number of Ports: 36
 Data Rate: InfiniBand 4X EDR
 Firmware: 11.0350.0394
 Topology: Enhanced Hypercube
 Primary Use: MPI and I/O traffic

Software

Base Tuning Notes

src.alt used: 143.dleslie->integer_overflow



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Submit Notes

The config file option 'submit' was used.

General Notes

Software environment:

```
export MPI_REQUEST_MAX=65536
export MPI_TYPE_MAX=32768
export MPI_IB_RAILS=2
export MPI_IB_IMM_UPGRADE=false
export MPI_IB_DCIS=2
export MPI_IB_HYPER_LAZY=false
export MPI_CONNECTIONS_THRESHOLD=0
ulimit -s unlimited
```

BIOS settings:

AMI BIOS version SAED7177, 07/17/2017

Job Placement:

Each MPI job was assigned to a topologically compact set of nodes.

Additional notes regarding interconnect:

The Infiniband network consists of two independent planes, with half the switches in the system allocated to each plane. I/O traffic is restricted to one plane, while MPI traffic can use both planes.

Base Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

126.lammps: icpc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

icc ifort

Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG



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Base Optimization Flags

C benchmarks:

-O3 -xCORE-AVX512 -no-prec-div -ipo

C++ benchmarks:

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

Fortran benchmarks:

-O3 -xCORE-AVX512 -no-prec-div -ipo

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX512 -no-prec-div -ipo

Base Other Flags

C benchmarks:

-lmpi

C++ benchmarks:

126.lammps: -lmpi

Fortran benchmarks:

-lmpi

Benchmarks using both Fortran and C:

-lmpi

The flags file that was used to format this result can be browsed at

http://www.spec.org/mpi2007/flags/HPE_x86_64_Intel18_flags.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/mpi2007/flags/HPE_x86_64_Intel18_flags.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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