SPEC® MPIM2007 Result

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Hewlett Packard Enterprise

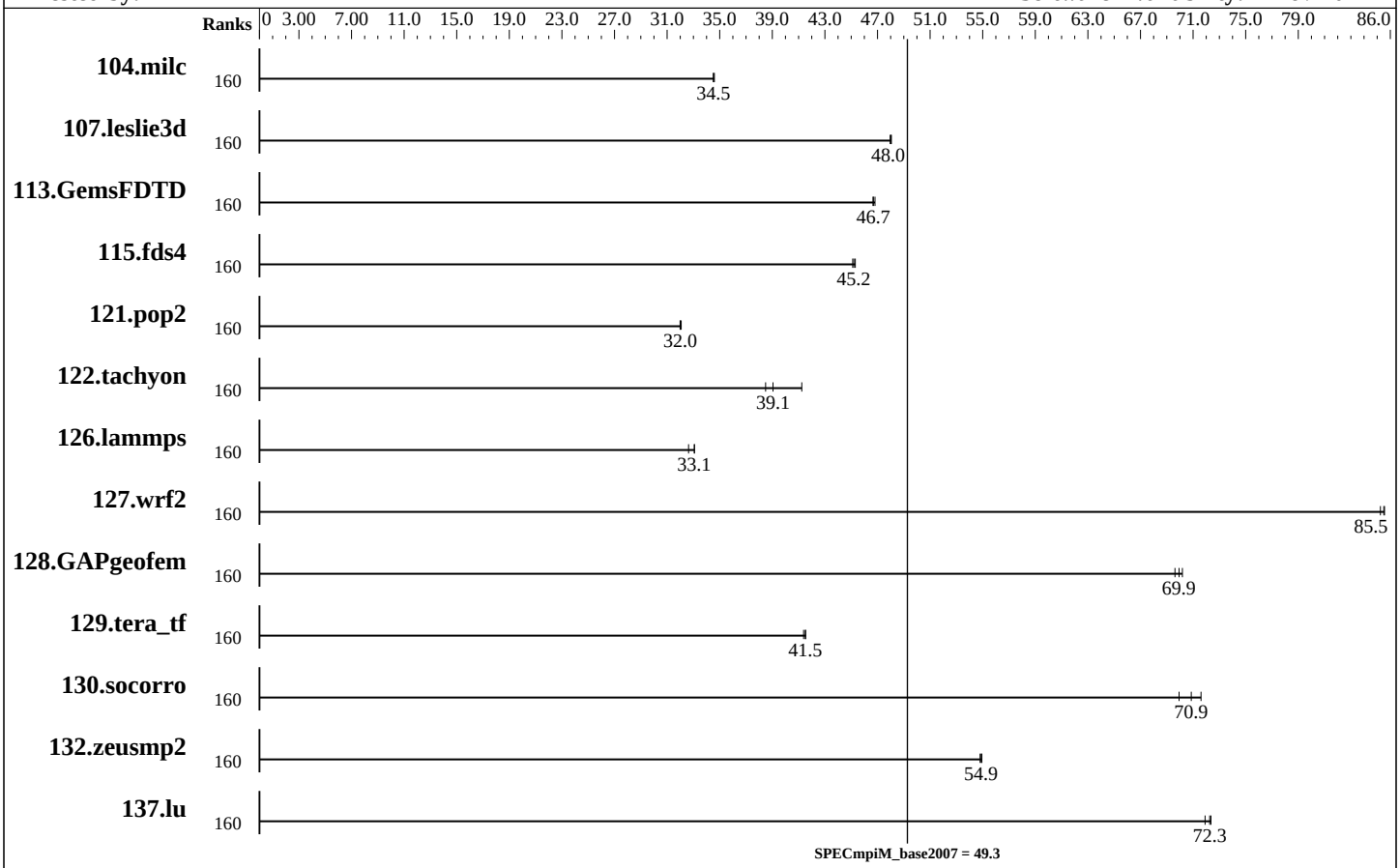
SGI 8600
(Intel Xeon Gold 6148, 2.40 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 49.3

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
104.milc	160	**45.3**	**34.5**	45.2	34.6	45.3	34.5							
107.leslie3d	160	109	48.0	109	48.1	**109**	**48.0**							
113.GemsFDTD	160	**135**	**46.7**	135	46.8	135	46.7							
115.fds4	160	43.2	45.1	**43.2**	**45.2**	43.1	45.3							
121.pop2	160	129	32.0	**129**	**32.0**	129	32.1							
122.tachyon	160	67.8	41.2	**71.6**	**39.1**	72.7	38.5							
126.lammps	160	**88.2**	**33.1**	89.3	32.6	88.1	33.1							
127.wrf2	160	91.1	85.6	91.5	85.2	**91.2**	**85.5**							
128.GAPgeofem	160	29.4	70.2	29.7	69.6	**29.5**	**69.9**							
129.tera_tf	160	66.6	41.5	**66.7**	**41.5**	66.9	41.4							

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	160	53.3	71.6	54.6	69.9	**53.9**	**70.9**							
132.zeusmp2	160	**56.5**	**54.9**	56.5	54.9	56.6	54.8							
137.lu	160	**50.9**	**72.3**	51.1	71.9	50.8	72.4							

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:	HPE XA730i Gen10 Server Node
Interconnect:	InfiniBand (MPI and I/O)
File Server Node:	Lustre FS
Total Compute Nodes:	4
Total Chips:	8
Total Cores:	160
Total Threads:	320
Total Memory:	768 GB
Base Ranks Run:	160
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:	4
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

Continued on next page

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

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

Node Description: HPE XA730i Gen10 Server Node

Ports Used:	1
Interconnect Type:	InfiniBand

Node Description: Lustre FS

Hardware

Number of nodes:	4
Uses of the node:	fileserver
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

Software

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

Software

Continued on next page

Interconnect Description: InfiniBand (MPI and I/O)

Primary Use:	MPI and I/O traffic

Base Tuning Notes

```
src.alt used: 129.tera_tf->add_rank_support
src.alt used: 130.socorro->nullify_ptrs
```

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_CONNECTIONS_THRESHOLD=0
  export MPI_IB_DCIS=2
  export MPI_IB_HYPER_LAZY=false
  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:

Continued on next page

Base Compiler Invocation (Continued)

126.lammps: icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
icc ifort

Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG
127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX
130.socorro: -assume nostd_intent_in

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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