## SPEC® MPI2007 Result

### Hewlett Packard Enterprise

SGI 8600  
(Intel Xeon Gold 6148, 2.40 GHz)

<table>
<thead>
<tr>
<th>SPECmpiM_peak2007 = Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECmpiM_base2007 = 106</td>
</tr>
</tbody>
</table>

**MPI2007 license:** 1  
**Test sponsor:** HPE  
**Tested by:** HPE  
**Test date:** Oct-2017  
**Hardware Availability:** Jul-2017  
**Software Availability:** Nov-2017

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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</tr>
</tbody>
</table>

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

SGI 8600
(Intel Xeon Gold 6148, 2.40 GHz)

SPECmpiM_peak2007 = Not Run
SPECmpiM_base2007 = 106

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

Results Table (Continued)

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</tr>
</tbody>
</table>

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: 16
Total Chips: 32
Total Cores: 640
Total Threads: 1280
Total Memory: 3 TB
Base Ranks Run: 640
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: 16
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

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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### SPEC MPIM2007 Result

**Hewlett Packard Enterprise**

SGI 8600  
(Intel Xeon Gold 6148, 2.40 GHz)

**SPECmpiM_peak2007 = Not Run**  
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<tr>
<th>MPI2007 license</th>
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<th>Test date:</th>
<th>Oct-2017</th>
</tr>
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<tr>
<td>Test sponsor:</td>
<td>HPE</td>
<td>Hardware Availability:</td>
<td>Jul-2017</td>
</tr>
<tr>
<td>Tested by:</td>
<td>HPE</td>
<td>Software Availability:</td>
<td>Nov-2017</td>
</tr>
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**Node Description: HPE XA730i Gen10 Server Node**

<table>
<thead>
<tr>
<th>Ports Used:</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interconnect Type:</td>
<td>InfiniBand</td>
</tr>
</tbody>
</table>

**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 |
| Operating System: | Red Hat Enterprise Linux Server 7.3 (Maipo),  
Kernel 3.10.0-514.2.2.el7.x86_64 |
| System State: | Multi-user, run level 3 |

**Interconnect Description: InfiniBand (MPI and I/O)**

**Hardware**

| Vendor: | Mellanox Technologies and SGI |
| Model: | SGI P0002145 |
| Switch Model: | SGI P0002145 |
| Number of Switches: | 2 |
| Number of Ports: | 36 |
| Data Rate: | InfiniBand 4X EDR |
| Firmware: | 11.0350.0394 |
| Topology: | Enhanced Hypercube |

**Software**

| Adapter: | Mellanox MT27700 with ConnectX-4 ASIC |
| Adapter Driver: | OFED-3.3-1.0.0.0 |
| Operating System: | Red Hat Enterprise Linux Server 7.3 (Maipo),  
Kernel 3.10.0-514.2.2.el7.x86_64 |
| System State: | Multi-user, run level 3 |

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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
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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:
-1mpi

C++ benchmarks:
126.lammps: -1mpi

Fortran benchmarks:
-1mpi

Benchmarks using both Fortran and C:
-1mpi
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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.

Tested with SPEC MPI2007 v2.0.1.