SPEC® MPIM2007 Result

SGI

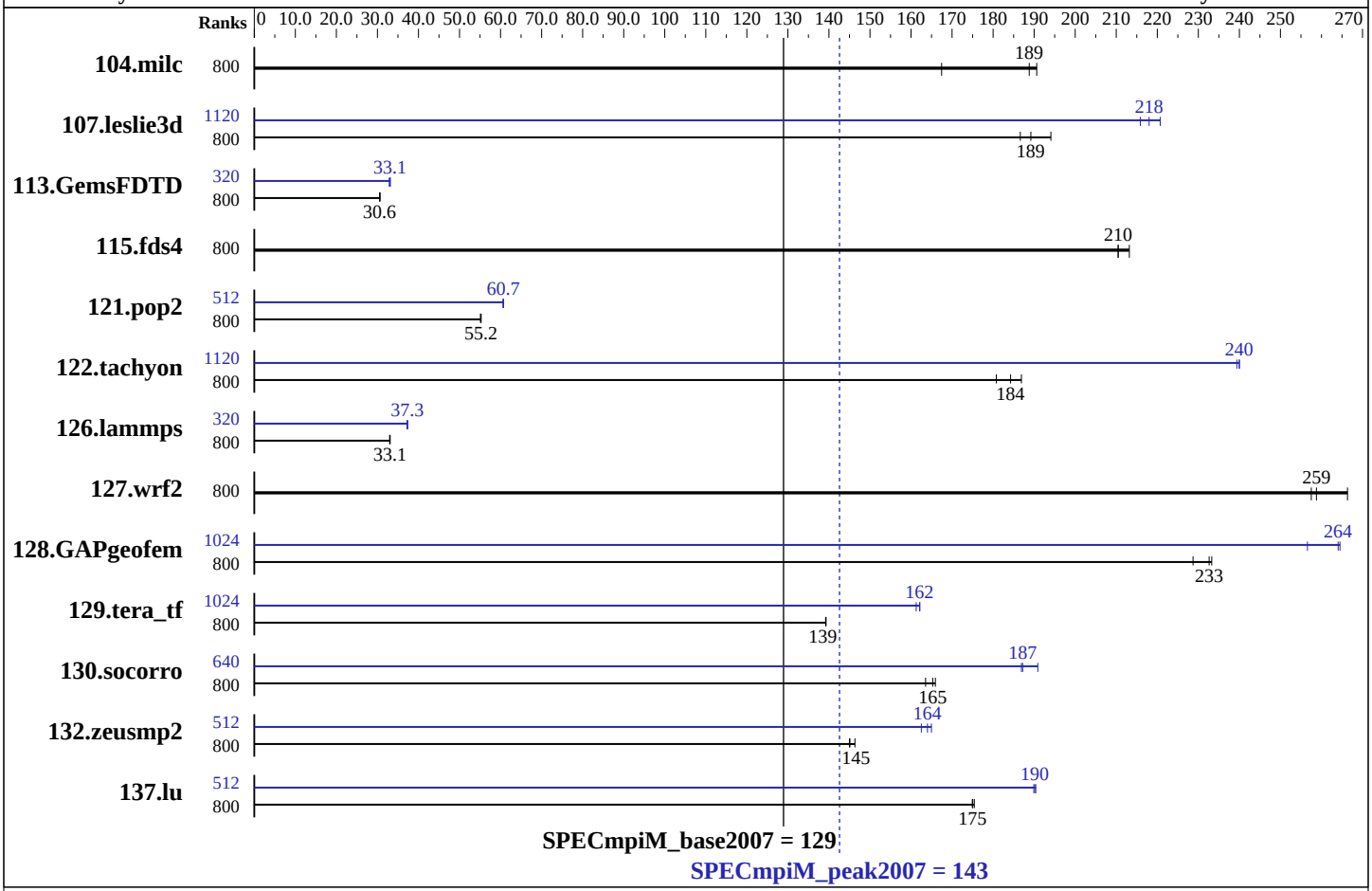
SGI ICE XA
(Intel Xeon E5-2690 v4, 2.6 GHz)

SPECmpiM_peak2007 = 143

SPECmpiM_base2007 = 129

MPI2007 license: 14
Test sponsor: SGI
Tested by: SGI

Test date: Jun-2016
Hardware Availability: May-2016
Software Availability: Jun-2016



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	800	9.35	167	**8.29**	**189**	8.21	191	800	9.35	167	**8.29**	**189**	8.21	191
107.leslie3d	800	28.0	187	**27.6**	**189**	26.9	194	1120	24.2	216	**23.9**	**218**	23.7	221
113.GemsFDTD	800	206	30.6	**206**	**30.6**	206	30.6	320	192	32.9	**191**	**33.1**	190	33.1
115.fds4	800	9.15	213	**9.27**	**210**	9.27	210	800	9.15	213	**9.27**	**210**	9.27	210
121.pop2	800	**74.7**	**55.2**	74.9	55.1	74.7	55.2	512	**68.0**	**60.7**	68.1	60.6	68.0	60.7
122.tachyon	800	15.5	181	15.0	187	**15.2**	**184**	1120	**11.7**	**240**	11.7	240	11.7	239
126.lammps	800	88.4	33.0	88.1	33.1	**88.1**	**33.1**	320	78.3	37.2	78.0	37.4	**78.2**	**37.3**
127.wrf2	800	**30.1**	**259**	29.3	266	30.3	258	800	**30.1**	**259**	29.3	266	30.3	258
128.GAPgeofem	800	9.03	229	**8.88**	**233**	8.85	233	1024	8.05	257	7.81	265	**7.82**	**264**
129.tera_tf	800	19.9	139	**19.9**	**139**	19.9	139	1024	17.2	161	17.1	162	**17.1**	**162**

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	800	23.0	166	**23.1**	**165**	23.3	164	640	20.0	191	20.4	187	**20.4**	**187**
132.zeusmp2	800	21.4	145	**21.4**	**145**	21.2	146	512	18.8	165	19.1	163	**18.9**	**164**
137.lu	800	21.0	175	**21.0**	**175**	21.0	175	512	**19.3**	**190**	19.3	190	19.4	190

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:	SGI ICE XA IP-125 CS
Interconnect:	InfiniBand (MPI and I/O)
File Server Node:	SGI MIS Server
Total Compute Nodes:	40
Total Chips:	80
Total Cores:	1120
Total Threads:	2240
Total Memory:	5 TB
Base Ranks Run:	800
Minimum Peak Ranks:	320
Maximum Peak Ranks:	1120

Software Summary

C Compiler:	Intel C++ Composer XE 2016 for Linux, Version 16.0.3.210 Build 20160415
C++ Compiler:	Intel C++ Composer XE 2016 for Linux Version 16.0.3.210 Build 20160405
Fortran Compiler:	Intel Fortran Composer XE 2016 for Linux, Version 16.0.3.210 Build 20160405
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	SGI MPT 2.14 Patch 11333
Other MPI Info:	OFED 3.2.2
Pre-processors:	None
Other Software:	None

Node Description: SGI ICE XA IP-125 CS

Hardware

Number of nodes:	40
Uses of the node:	compute
Vendor:	SGI
Model:	SGI ICE XA (Intel Xeon E5-2690 v4, 2.6 GHz)
CPU Name:	Intel Xeon E5-2690 v4
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	28
Cores per chip:	14
Threads per core:	2
CPU Characteristics:	14 Core, 2.60 GHz, 9.6 GT/s QPI Intel Turbo Boost Technology up to 3.50 GHz Hyper-Threading Technology enabled
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:	35 MB I+D on chip per chip
Other Cache:	None
Memory:	128 GB (8 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem:	None
Other Hardware:	None
Adapter:	Mellanox MT27700 with ConnectX-4 ASIC (PCIe x16 Gen3 8 GT/s)
Number of Adapters:	2
Slot Type:	PCIe x16 Gen3

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Software

Adapter:	Mellanox MT27700 with ConnectX-4 ASIC (PCIe x16 Gen3 8 GT/s)
Adapter Driver:	OFED-3.2.1.5.3
Adapter Firmware:	12.14.0114
Operating System:	SUSE Linux Enterprise Server 11 SP4 (x86_64), Kernel 3.0.101-71.1.10690.1.PTF-default
Local File System:	NFSv3
Shared File System:	NFSv3 IPoIB
System State:	Multi-user, run level 3
Other Software:	SGI Tempo Compute Node 3.3.0, Build 714r18.sles11sp4-1604041900

Node Description: SGI ICE XA IP-125 CS

Data Rate:	InfiniBand 4X EDR
Ports Used:	1
Interconnect Type:	InfiniBand

Node Description: SGI MIS Server

Hardware

Number of nodes:	1
Uses of the node:	fileserver
Vendor:	SGI
Model:	SGI MIS Server
CPU Name:	Intel Xeon E5-2670
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	16
Cores per chip:	8
Threads per core:	1
CPU Characteristics:	Intel Turbo Boost Technology up to 3.30 GHz Hyper-Threading Technology disabled
CPU MHz:	1200
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	20 MB I+D on chip per chip
Other Cache:	None
Memory:	128 GB (12 * 8 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem:	45 TB RAID 6 8 x 6+2 900GB (WD, 10K RPM)
Other Hardware:	None
Adapter:	Mellanox MT27500 with ConnectX-3 ASIC
Number of Adapters:	2
Slot Type:	PCIe x8 Gen3
Data Rate:	InfiniBand 4X FDR
Ports Used:	2
Interconnect Type:	InfiniBand

Software

Adapter:	Mellanox MT27500 with ConnectX-3 ASIC
Adapter Driver:	OFED-3.2.0.1.1
Adapter Firmware:	2.36.5000
Operating System:	SUSE Linux Enterprise Server 11 (x86_64), Kernel 3.0.101-0.46-default
Local File System:	xfs
Shared File System:	--
System State:	Multi-user, run level 3
Other Software:	SGI Foundation Software 2.9, Build 711r2.sles11sp3-1411192056

Interconnect Description: InfiniBand (MPI and I/O)

Hardware

Vendor:	Mellanox Technologies and SGI
Model:	None
Switch Model:	SGI P0002145
Number of Switches:	10
Number of Ports:	36
Data Rate:	InfiniBand 4x EDR
Firmware:	11.0350.0394
Topology:	Enhanced Hypercube

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Interconnect Description: InfiniBand (MPI and I/O)

Primary Use:	MPI and I/O traffic

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_UPGRADE_SENDS=50
  export MPI_IB_IMM_UPGRADE=false
  export MPI_IB_DCIS=2
  export MPI_CONNECTIONS_THRESHOLD=0
  export MPI_IB_MTU=4096
  ulimit -s unlimited
BIOS settings:
  AMI BIOS version HA012036
  Hyper-Threading Technology enabled
  Intel Turbo Boost Technology enabled (default)
  Transparent Hugepages Enabled
Job Placement:
  Each MPI job was assigned to a topologically compact set
  of nodes.  The base run used 10 ranks per socket and peak
  runs varied between 4 and 14 ranks per socket.  The total
  number of sockets and nodes was constant.
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.
```

Compiler Invocation

C benchmarks:
`icc`

C++ benchmarks:

126.lammps: `icpc`

Fortran benchmarks:
`ifort`

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Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
icc ifort

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-AVX2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX2 -no-prec-div -ansi-alias

Fortran benchmarks:
-O3 -xCORE-AVX2 -no-prec-div

Benchmarks using both Fortran and C:
-O3 -xCORE-AVX2 -no-prec-div

Peak Optimization Flags

C benchmarks:

104.milc: basepeak = yes

122.tachyon: -O3 -xCORE-AVX2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX2 -no-prec-div -ansi-alias

Fortran benchmarks:
-O3 -xCORE-AVX2 -no-prec-div

Benchmarks using both Fortran and C:

115.fds4: basepeak = yes

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Peak Optimization Flags (Continued)

121.pop2: `-O3 -xCORE-AVX2 -no-prec-div`

127.wrf2: `basepeak = yes`

128.GAPgeofem: `Same as 121.pop2`

130.socorro: `Same as 121.pop2`

132.zeusmp2: `Same as 121.pop2`

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/SGI_x86_64_Intel14_flags.20140908.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.20140908.xml`

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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