SPEC® MPIM2007 Result

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Cray

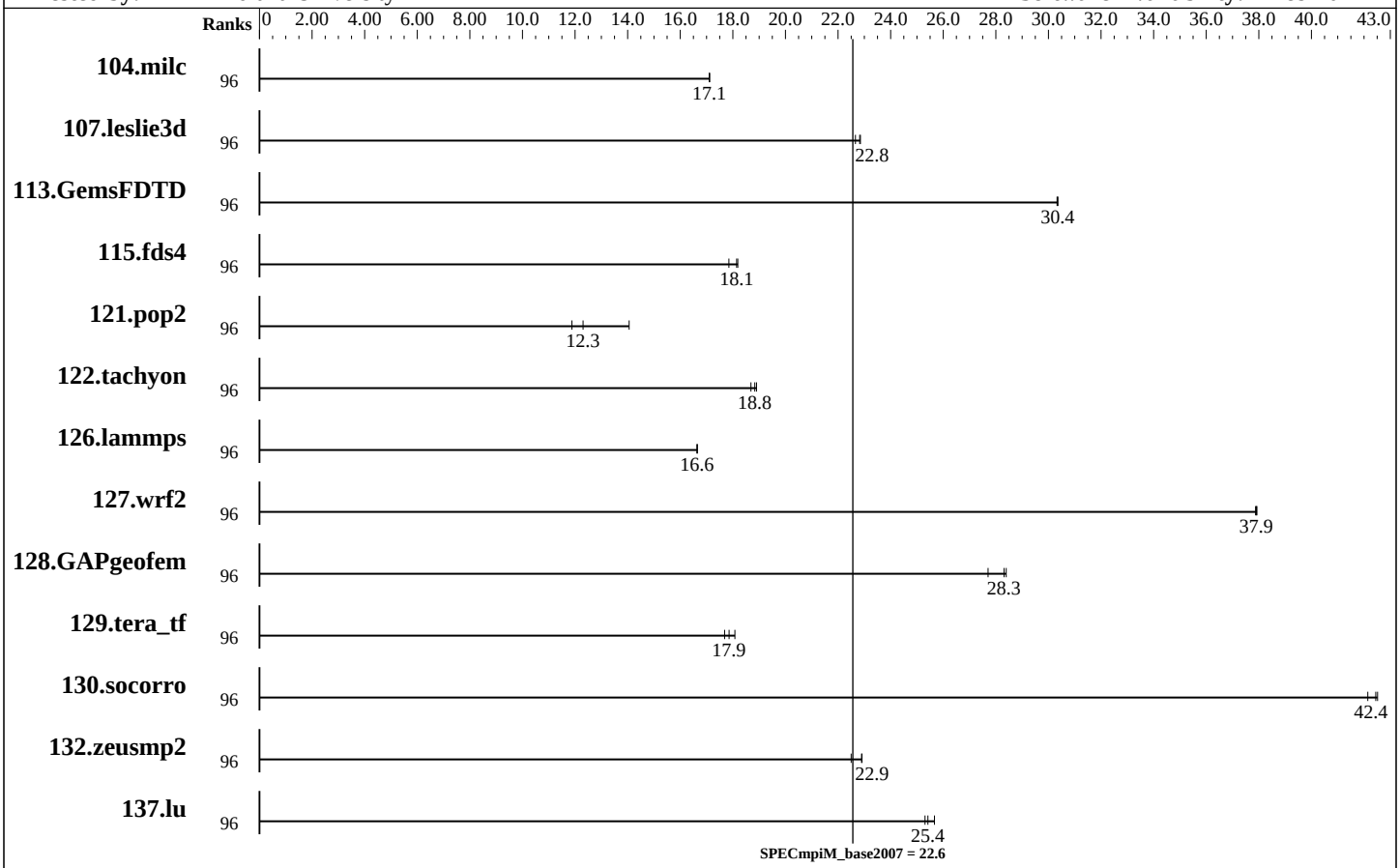
Cray XC30 (Intel Xeon E5-2697 v2)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 22.6

MPI2007 license: 3440A
Test sponsor: Indiana University
Tested by: Indiana University

Test date: Mar-2017
Hardware Availability: Apr-2013
Software Availability: Feb-2017



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	96	91.5	17.1	91.5	17.1	**91.5**	**17.1**							
107.leslie3d	96	228	22.9	**229**	**22.8**	230	22.7							
113.GemsFDTD	96	208	30.4	208	30.3	**208**	**30.4**							
115.fds4	96	**108**	**18.1**	109	17.8	107	18.2							
121.pop2	96	347	11.9	**335**	**12.3**	294	14.1							
122.tachyon	96	150	18.7	**149**	**18.8**	148	18.9							
126.lammps	96	175	16.6	175	16.6	**175**	**16.6**							
127.wrf2	96	206	37.9	206	37.9	**206**	**37.9**							
128.GAPgeofem	96	**72.9**	**28.3**	72.7	28.4	74.5	27.7							
129.tera_tf	96	157	17.7	**155**	**17.9**	153	18.1							

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	96	**89.9**	**42.4**	89.8	42.5	90.6	42.1							
132.zeusmp2	96	138	22.5	135	22.9	**136**	**22.9**							
137.lu	96	**145**	**25.4**	145	25.3	143	25.7							

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:	Big Red II Plus Node
Interconnects:	Infiniband (QDR) Cray Aries
File Server Node:	Data Capacitor II
Total Compute Nodes:	4
Total Chips:	8
Total Cores:	96
Total Threads:	192
Total Memory:	256 GB
Base Ranks Run:	96
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--

Software Summary

C Compiler:	Intel C Composer XE 2017 for Linux, Version 17.0.2.174 Build 20170213
C++ Compiler:	Intel C++ Composer XE 2017 for Linux, Version 17.0.2.174 Build 20170213
Fortran Compiler:	Intel Fortran Composer XE 2017 for Linux, Version 17.0.2.174 Build 20170213
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	Cray MPI (MPT) 7.5.0
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: Big Red II Plus Node

Hardware

Number of nodes:	4
Uses of the node:	compute
Vendor:	Cray
Model:	XC30
CPU Name:	Intel Xeon E5-2697 v2
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	24
Cores per chip:	12
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology disabled, Hyper-Threading enabled
CPU MHz:	2700
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:	64 GB (8 x 8 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem:	None
Other Hardware:	None
Adapter:	Mellanox Technologies MT27500 ConnectX-3
Number of Adapters:	1
Slot Type:	PCIe x16 Gen 3

Continued on next page

Software

Adapter:	Mellanox Technologies MT27500 ConnectX-3
Adapter Driver:	1.0-ofed1.5.4.1
Adapter Firmware:	2.33.5100
Adapter:	Cray Aries
Adapter Driver:	Proprietary Cray_kgni
Adapter Firmware:	v004.r091
Operating System:	SUSE Linux Enterprise Server 11 SP3 (x86_64), Cray Linux Environment 5.2 3.0.101-0.46.1_1.0502.8871-cray_ari_c
Local File System:	None
Shared File System:	Lustre
System State:	Multi-User
Other Software:	Slurm 15.08.12

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Node Description: Big Red II Plus Node

Data Rate:	40Gbps
Ports Used:	1
Interconnect Type:	40 Gigabit Infiniband (QDR)
Adapter:	Cray Aries
Number of Adapters:	1
Slot Type:	PCIe x16 Gen 3
Data Rate:	126 Gbps
Ports Used:	4
Interconnect Type:	Aries

Node Description: Data Capacitor II

Hardware

Number of nodes:	2
Uses of the node:	fileserver
Vendor:	DDN
Model:	DDN SFA12K
CPU Name:	Intel Xeon CPU E5-2620
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	12
Cores per chip:	6
Threads per core:	1
CPU Characteristics:	Intel Turbo Boost Technology up to 2.50 GHz
CPU MHz:	2000
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	15 MB I+D on chip per chip
Other Cache:	None
Memory:	96 GB
Disk Subsystem:	30 TB RAID 6, 10 (8 + 2) x 3 TB SAS Hitachi HUS724030ALS640, 7200RPM, 6.0Gbps
Other Hardware:	None
Adapter:	Mellanox ConnectX MHQH29-XTC
Number of Adapters:	1
Slot Type:	PCIe x8 Gen 2
Data Rate:	40Gbps
Ports Used:	1
Interconnect Type:	40 Gigabit Infiniband (QDR)

Software

Adapter:	Mellanox ConnectX MHQH29-XTC
Adapter Driver:	1.0-ofed1.5.4.1
Adapter Firmware:	2.9.1000
Operating System:	CentOS 6.2
Local File System:	Linux/ext4
Shared File System:	lustre
System State:	Multi-User
Other Software:	None

Interconnect Description: Infiniband (QDR)

Hardware

Vendor:	DDN
Model:	Mellanox SX6506
Switch Model:	Mellanox SX6506

Software

Continued on next page

Interconnect Description: Infiniband (QDR)

Number of Switches:	1
Number of Ports:	108
Data Rate:	56 Gbps
Firmware:	mellanox SX6506
Topology:	switched
Primary Use:	Lustre fileserver

Interconnect Description: Cray Aries

Hardware

Vendor:	Cray
Model:	Cray Aries
Switch Model:	Cray Aries
Number of Switches:	144
Number of Ports:	48
Data Rate:	126 Gb/s
Firmware:	v004.r091
Topology:	Dragonfly
Primary Use:	MPI traffic

Software

Submit Notes

```
The config file option 'submit' was used.
submit = srun -c 2 -n $ranks -q $command
```

General Notes

```
130.socorro (base): "nullify_ptrs" src.alt was used.

MPI startup command:
  srun command was used to start MPI jobs.

export MPICH_NO_BUFFER_ALIAS_CHECK=true
  If set, the buffer alias error check for collectives is
  disabled. The MPI standard does not allow aliasing of type
  OUT or INOUT parameters on the same collective function
  call. The default is false.

Job placement:
  Slurm is used for job placement.
  Compute nodes are selected by Slurm.
  No specific node selection is used.
```

Base Compiler Invocation

C benchmarks:
`cc`

C++ benchmarks:

126.lammps: `CC`

Fortran benchmarks:
`ftn`

Benchmarks using both Fortran and C:
`cc ftn`

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 -ansi-alias -no-prec-div -ipo -xhost -fp-model fast=2`

C++ benchmarks:

126.lammps: `-O3 -ansi-alias -no-prec-div -ipo -xhost -fp-model fast=2`

Fortran benchmarks:
`-O3 -ansi-alias -no-prec-div -ipo -xhost -fp-model fast=2`

Benchmarks using both Fortran and C:
`-O3 -ansi-alias -no-prec-div -ipo -xhost -fp-model fast=2`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/EM64T_Intel170_flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/EM64T_Intel170_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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