SPEC® MPIM2007 Result

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Cray

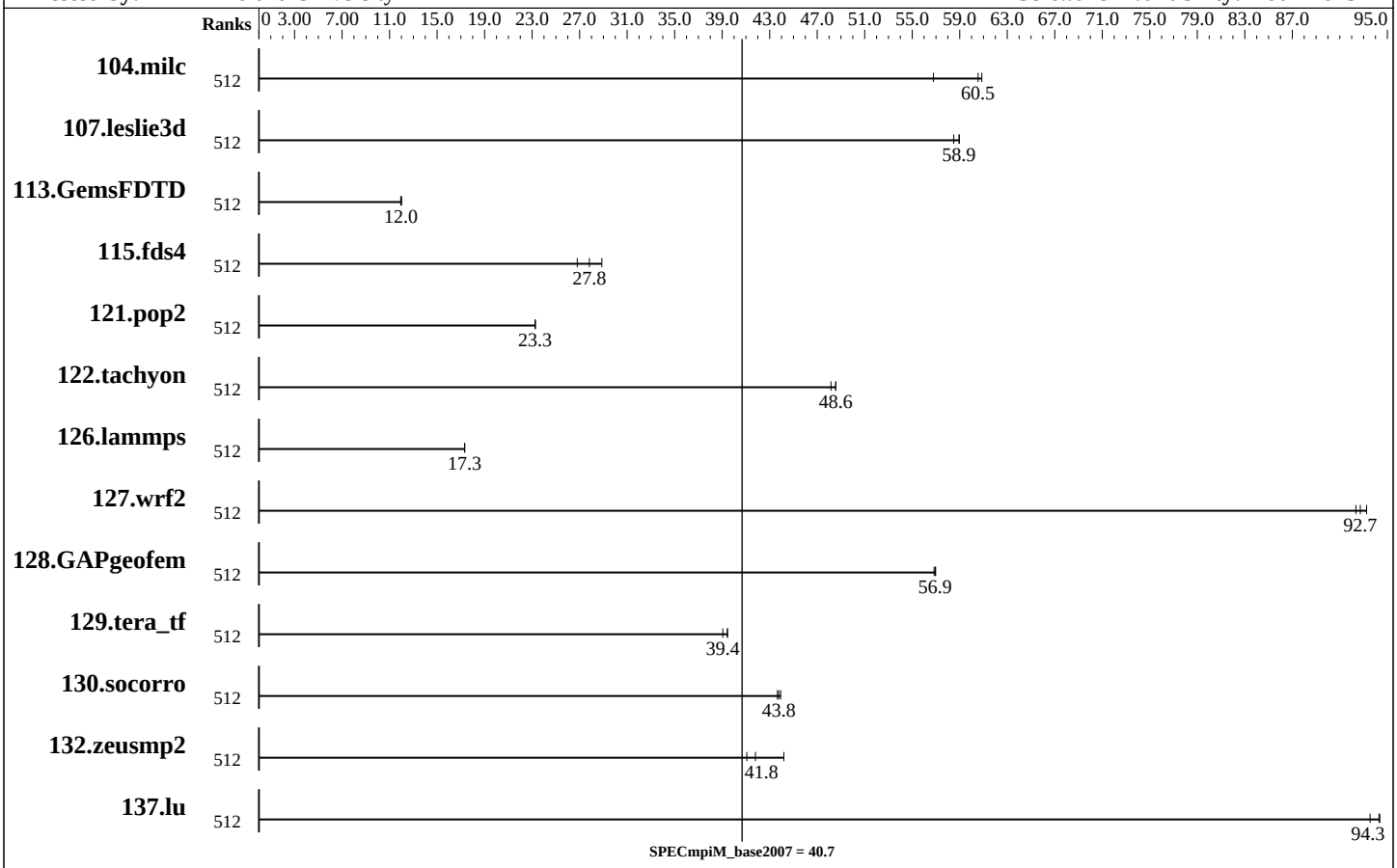
Big Red II (AMD Opteron 6380, 2.5 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 40.7

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

Test date: Mar-2015
Hardware Availability: Apr-2013
Software Availability: Jun-2013



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	512	**25.8**	**60.5**	25.7	60.9	27.6	56.8							
107.leslie3d	512	88.5	59.0	**88.6**	**58.9**	89.2	58.5							
113.GemsFDTD	512	528	11.9	525	12.0	**527**	**12.0**							
115.fds4	512	67.6	28.9	72.8	26.8	**70.1**	**27.8**							
121.pop2	512	**177**	**23.3**	177	23.3	177	23.3							
122.tachyon	512	58.1	48.2	57.6	48.6	**57.6**	**48.6**							
126.lammps	512	168	17.3	**168**	**17.3**	168	17.3							
127.wrf2	512	**84.1**	**92.7**	84.4	92.4	83.6	93.3							
128.GAPgeofem	512	36.2	57.0	36.3	56.8	**36.3**	**56.9**							
129.tera_tf	512	**70.2**	**39.4**	70.9	39.1	70.2	39.5							

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	512	**87.2**	**43.8**	87.5	43.6	86.9	43.9							
132.zeusmp2	512	75.5	41.1	70.2	44.2	**74.2**	**41.8**							
137.lu	512	39.0	94.4	**39.0**	**94.3**	39.3	93.5							

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 Node
Interconnects:	Infiniband (QDR) Cray Gemini
File Server Node:	Data Capacitor II
Total Compute Nodes:	32
Total Chips:	64
Total Cores:	1024
Total Threads:	1024
Total Memory:	2 TB
Base Ranks Run:	512
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--

Software Summary

C Compiler:	Intel C Composer XE 2013 for Linux, Version 13.1.3.192 Build 20130607
C++ Compiler:	Intel C++ Composer XE 2013 for Linux, Version 13.1.3.192 Build 20130607
Fortran Compiler:	Intel Fortran Composer XE 2013 for Linux, Version 13.1.3.192 Build 20130607
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	Cray MPI (MPT) 7.1.2
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: Big Red II Node

Hardware

Number of nodes:	32
Uses of the node:	compute
Vendor:	Cray
Model:	XE6
CPU Name:	AMD Opteron 6380
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	32
Cores per chip:	16
Threads per core:	1
CPU Characteristics:	AMD Turbo CORE technology up to 3.40 GHz
CPU MHz:	2500
Primary Cache:	512 KB I on chip per chip, 64 KB I shared / 2 cores; 16 KB D on chip per core
Secondary Cache:	16 MB I+D on chip per chip, 2 MB shared / 2 cores
L3 Cache:	16 MB I+D on chip per chip, 8 MB shared / 8 cores
Other Cache:	None
Memory:	64 GB (8 x 8 GB 2Rx4 PC3L-12800R-11, ECC running at 1600 MHz and CL11)
Disk Subsystem:	None
Other Hardware:	None
Adapter:	Mellanox ConnectX MHQH29-XTC
Number of Adapters:	1
Slot Type:	PCIe x8 Gen 2

Continued on next page

Software

Adapter:	Mellanox ConnectX MHQH29-XTC
Adapter Driver:	1.0-ofed1.5.4
Adapter Firmware:	2.9.1000
Adapter:	Cray Gemini
Adapter Driver:	Proprietary Cray_kgni
Adapter Firmware:	0.17
Operating System:	SUSE Linux Enterprise Server 11 (x86_64), Cray Linux Environment 4.2 Kernel 2.6.32.59-0.7.1_1.0402.7496-cray_gem_c
Local File System:	None
Shared File System:	lustre
System State:	Multi-User
Other Software:	TORQUE-2.5.7

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Node Description: Big Red II Node

Data Rate:	40Gbps
Ports Used:	1
Interconnect Type:	40 Gigabit Infiniband (QDR)
Adapter:	Cray Gemini
Number of Adapters:	1
Slot Type:	AMD HyperTransport 3
Data Rate:	76.8Gbps
Ports Used:	1
Interconnect Type:	Gemini

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 SATA (Hitachi, 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
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

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Software Availability: Jun-2013

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 Gemini

Hardware

Vendor:	Cray
Model:	Cray Gemini
Switch Model:	Cray Gemini
Number of Switches:	264
Number of Ports:	48
Data Rate:	9.36 GB/s
Firmware:	0.17
Topology:	3D Torus
Primary Use:	MPI traffic

Software

Submit Notes

```
The config file option 'submit' was used.
```

General Notes

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

MPI startup command:
  aprun command was used to start MPI jobs. A flag below
  is used to place processes onto 16 cores out of 32 on a node:
  -cc 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30

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.

Network:
  3D Torus

Job placement:
  PBS is used for job placement.
  Compute nodes are selected by PBS.
  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 -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -no-prec-div`

Fortran benchmarks:
`-O3 -no-prec-div`

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

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20150429.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20150429.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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