



# SPEC® MPIM2007 Result

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## Cray

SPECmpiM\_peak2007 = Not Run

## Cray XC30 (Intel Xeon E5-2697 v2)

SPECmpiM\_base2007 = 49.0

MPI2007 license: 3440A

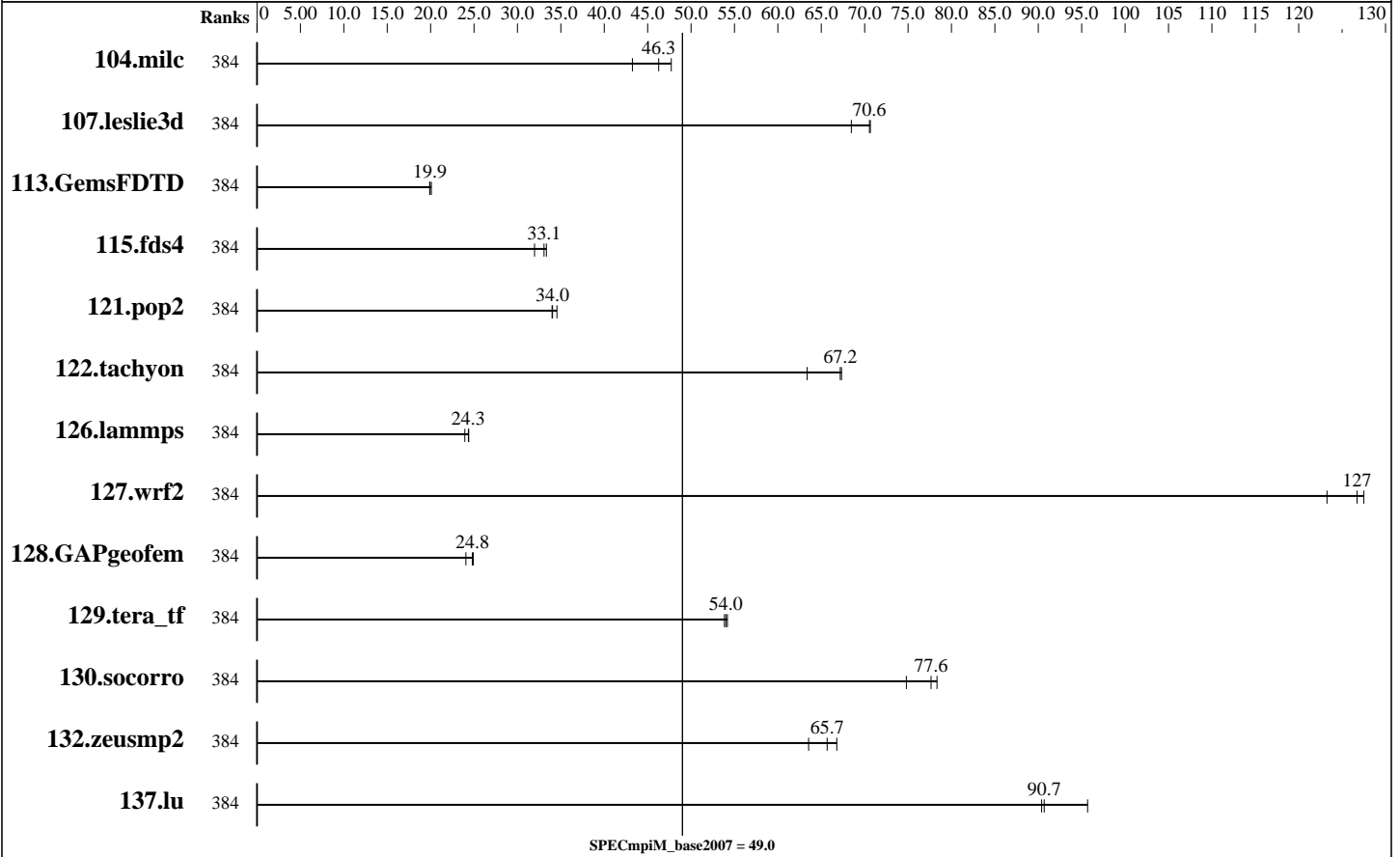
Test sponsor: Indiana University

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	384	<u>33.8</u>	<u>46.3</u>	32.8	47.7	36.2	43.2							
107.leslie3d	384	73.9	70.7	76.2	68.5	<u>74.0</u>	<u>70.6</u>							
113.GemsFDTD	384	314	20.1	<u>316</u>	<u>19.9</u>	317	19.9							
115.fds4	384	61.0	32.0	58.5	33.3	<u>59.0</u>	<u>33.1</u>							
121.pop2	384	119	34.5	121	34.0	<u>121</u>	<u>34.0</u>							
122.tachyon	384	41.5	67.3	<u>41.6</u>	<u>67.2</u>	44.1	63.4							
126.lammps	384	122	23.9	<u>120</u>	<u>24.3</u>	120	24.4							
127.wrf2	384	63.3	123	<u>61.5</u>	<u>127</u>	61.1	128							
128.GAPgeofem	384	<u>83.2</u>	<u>24.8</u>	85.8	24.1	82.9	24.9							
129.tera_tf	384	51.1	54.2	51.4	53.8	<u>51.2</u>	<u>54.0</u>							

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	384	<u>49.2</u>	<u>77.6</u>	48.7	78.3	51.0	74.8							
132.zeusmp2	384	46.5	66.8	<u>47.2</u>	<u>65.7</u>	48.8	63.5							
137.lu	384	40.7	90.4	<u>40.5</u>	<u>90.7</u>	38.4	95.7							

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: 16  
 Total Chips: 32  
 Total Cores: 384  
 Total Threads: 768  
 Total Memory: 1 TB  
 Base Ranks Run: 384  
 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: 16  
 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

#### 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

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## 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	Software
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	

## 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.



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## 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](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](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](mailto:webmaster@spec.org).

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