



# SPEC<sup>®</sup> MPIL2007 Result

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Cray

SPECmpiL\_peak2007 = Not Run

Cray XC30 (Intel Xeon E5-2697 v2)

SPECmpiL\_base2007 = 8.14

MPI2007 license: 3440A

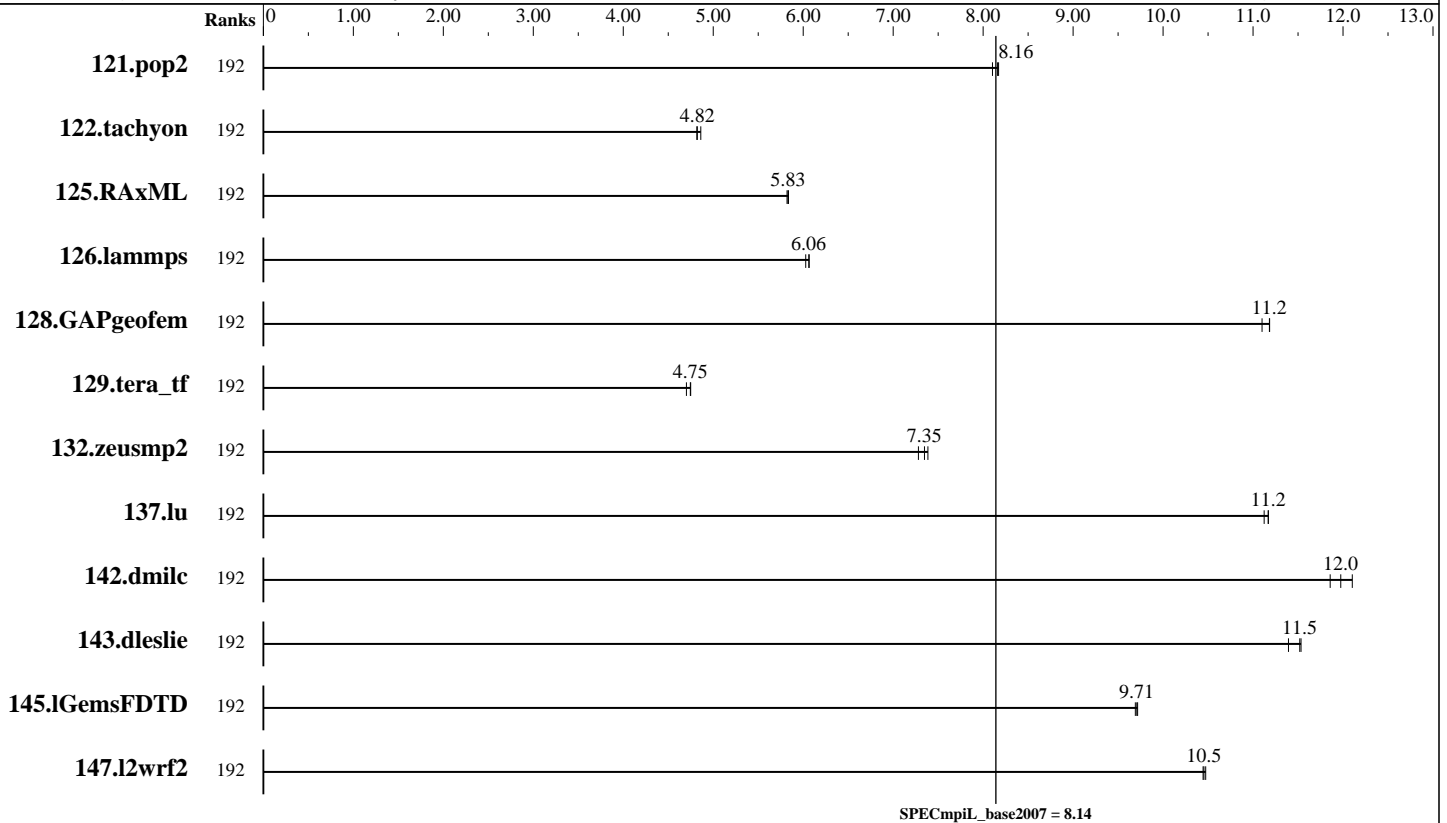
Test sponsor: Indiana University

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
121.pop2	192	480	8.10	476	8.17	<u>477</u>	<u>8.16</u>							
122.tachyon	192	400	4.86	403	4.82	<u>403</u>	<u>4.82</u>							
125.RAxML	192	500	5.84	502	5.82	<u>501</u>	<u>5.83</u>							
126.lammps	192	408	6.03	405	6.07	<u>406</u>	<u>6.06</u>							
128.GAPgeofem	192	535	11.1	531	11.2	<u>531</u>	<u>11.2</u>							
129.tera_tf	192	231	4.75	234	4.70	<u>232</u>	<u>4.75</u>							
132.zeusmp2	192	291	7.28	<u>289</u>	<u>7.35</u>	287	7.39							
137.lu	192	376	11.2	<u>376</u>	<u>11.2</u>	378	11.1							
142.dmilc	192	304	12.1	311	11.9	<u>308</u>	<u>12.0</u>							
143.dleslie	192	269	11.5	272	11.4	<u>269</u>	<u>11.5</u>							
145.lGemsFDTD	192	<u>454</u>	<u>9.71</u>	454	9.72	455	9.69							
147.l2wrf2	192	<u>785</u>	<u>10.5</u>	783	10.5	785	10.4							

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Standard Performance Evaluation Corporation

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### 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: 8  
 Total Chips: 16  
 Total Cores: 192  
 Total Threads: 384  
 Total Memory: 512 GB  
 Base Ranks Run: 192  
 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: 8  
 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  
 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

### 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: Data Capacitor II

Hardware		Software	
Number of nodes:	2	Adapter:	Mellanox ConnectX MHQH29-XTC
Uses of the node:	fileserver	Adapter Driver:	1.0-ofed1.5.4.1
Vendor:	DDN	Adapter Firmware:	2.9.1000
Model:	DDN SFA12K	Operating System:	CentOS 6.2
CPU Name:	Intel Xeon CPU E5-2620	Local File System:	Linux/ext4
CPU(s) orderable:	1-2 chips	Shared File System:	lustre
Chips enabled:	2	System State:	Multi-User
Cores enabled:	12	Other Software:	None
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)		

### Interconnect Description: Infiniband (QDR)

Hardware		Software	
Vendor:	DDN		
Model:	Mellanox SX6506		
Switch Model:	Mellanox SX6506		
Number of Switches:	1		
Number of Ports:	108		
Data Rate:	56 Gbps		
Firmware:	mellanox SX6506		
Topology:	switched		
Primary Use:	Lustre fileserver		



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## 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 1 -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

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## Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:  
cc ftn

## Base Portability Flags

121.pop2: -DSPEC\_MPI\_CASE\_FLAG  
126.lammps: -DMPICH\_IGNORE\_CXX\_SEEK

## Base Optimization Flags

C benchmarks:

-O3 -ansi-alias -no-prec-div -fp-model fast=2

C++ benchmarks:

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

Fortran benchmarks:

-O3 -ansi-alias -no-prec-div -fp-model fast=2

Benchmarks using both Fortran and C:

-O3 -ansi-alias -no-prec-div -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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