



# SPEC® MPIL2007 Result

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## NEC

NEC HPC1812Rg-2 (Intel Xeon E5-2650 v4, 2.20 GHz, DDR4-2400 MHz, SMT ON, Turbo ON)

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 4.88

MPI2007 license: 055A

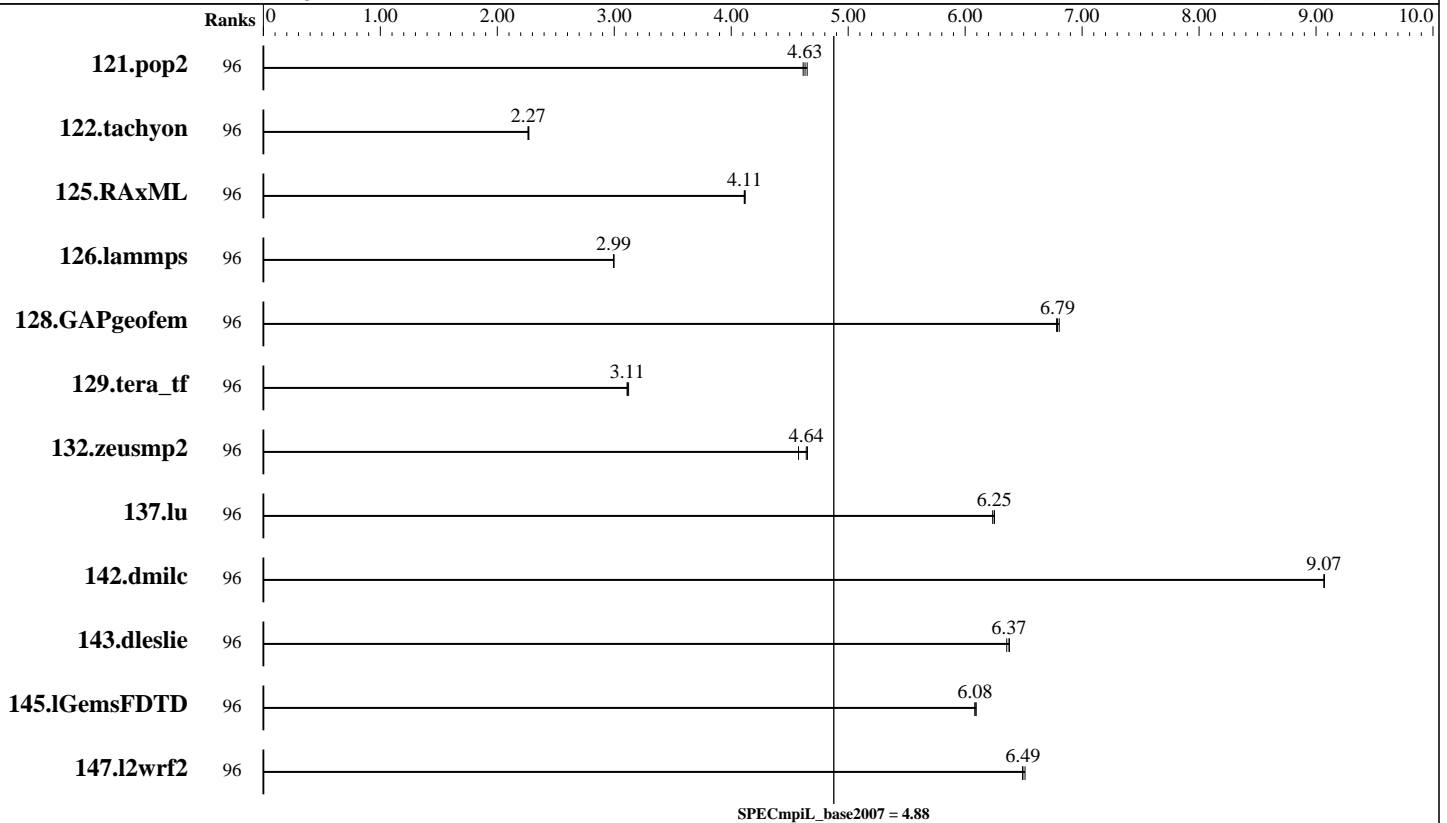
Test sponsor: RWTH University Aachen

Tested by: Bo Wang

Test date: Sep-2017

Hardware Availability: Oct-2016

Software Availability: Oct-2016



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	96	837	4.65	<b>840</b>	<b>4.63</b>	843	4.61							
122.tachyon	96	859	2.26	856	2.27	<b>858</b>	<b>2.27</b>							
125.RAxML	96	709	4.12	<b>709</b>	<b>4.11</b>	710	4.11							
126.lammps	96	820	3.00	822	2.99	<b>821</b>	<b>2.99</b>							
128.GAPgeofem	96	875	6.78	<b>874</b>	<b>6.79</b>	872	6.80							
129.tera_tf	96	352	3.12	353	3.11	<b>353</b>	<b>3.11</b>							
132.zeusmp2	96	456	4.65	<b>457</b>	<b>4.64</b>	463	4.58							
137.lu	96	674	6.24	672	6.25	<b>672</b>	<b>6.25</b>							
142.dmilc	96	406	9.07	406	9.07	<b>406</b>	<b>9.07</b>							
143.dleslie	96	488	6.36	486	6.38	<b>486</b>	<b>6.37</b>							
145.lGemsFDTD	96	<b>725</b>	<b>6.08</b>	724	6.09	725	6.08							
147.l2wrf2	96	<b>1263</b>	<b>6.49</b>	1264	6.49	1260	6.51							

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

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### Hardware Summary

Type of System: Homogeneous  
 Compute Node: NEC HPC  
 Interconnects: Omni-Path Architecture  
 Gigabit Ethernet  
 File Server Node: NFS  
 Total Compute Nodes: 4  
 Total Chips: 8  
 Total Cores: 96  
 Total Threads: 192  
 Total Memory: 512 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  
 C++ Compiler: Intel C++ Composer XE 2017 for Linux, Version 17.0.2.174  
 Fortran Compiler: Intel Fortran Composer XE 2017 for Linux, Version 17.0.2.174  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: Intel MPI Library 2017 for Linux, Version 2017.1.132  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: NEC HPC

### Hardware

Number of nodes: 4  
 Uses of the node: compute  
 Vendor: Intel  
 Model: NEC HPC 1812Rg  
 CPU Name: Intel Xeon E5-2650 v4  
 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 up to 2.9 GHz (single)/2.2 GHz (all), 9.6 GT/s QPI, Hyper-Threading enabled  
 CPU MHz: 2200  
 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 shared / 12 cores  
 Other Cache: None  
 Memory: 128 GB (8 x 16 GB 2Rx8 PC4-2400T-R)  
 Disk Subsystem: SATA, Samsung SM863, 120GB, SSD  
 Other Hardware: None  
 Adapter: Intel Omni-Path Host Fabric Interface Adapter 100 Series 1 Port PCIe X8  
 Number of Adapters: 1  
 Slot Type: PCI-E x8  
 Data Rate: 58Gb/s  
 Ports Used: 1  
 Interconnect Type: Omni-Path

### Software

Adapter: Intel Omni-Path Host Fabric Interface Adapter 100 Series 1 Port PCIe X8  
 Adapter Driver: hfi1  
 Adapter Firmware: 2.33.5100  
 Operating System: CentOS Linux release 7.3.1611 (Core)  
 Local File System: Linux/xfs  
 Shared File System: NFS  
 System State: Multi-User  
 Other Software: None



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### Node Description: NFS

Hardware		Software	
Number of nodes:	1	Adapter:	10 Gigabit Ethernet Controller
Uses of the node:	fileserver		IX1-SFP+
Vendor:	NETAPP	Adapter Driver:	N/A
Model:	FAS6240	Adapter Firmware:	1.8-0
CPU Name:	Intel Xeon CPU X5670	Operating System:	NetApp Release 8.2.3P2 7-Mode
CPU(s) orderable:	1-2 chips	Local File System:	None
Chips enabled:	2	Shared File System:	NFS
Cores enabled:	12	System State:	Multi-User
Cores per chip:	6	Other Software:	None
Threads per core:	2		
CPU Characteristics:	None		
CPU MHz:	2930		
Primary Cache:	32 KB I + 32 KB D on chip per core		
Secondary Cache:	256 KB I+D on chip per core		
L3 Cache:	12 MB I+D on chip per chip		
Other Cache:	None		
Memory:	96 GB		
Disk Subsystem:	216 disks, 2 TB/disk, 432TB total		
Other Hardware:	None		
Adapter:	10 Gigabit Ethernet Controller		
	IX1-SFP+		
Number of Adapters:	2		
Slot Type:	PCI-Express x8		
Data Rate:	10Gbps Ethernet		
Ports Used:	2		
Interconnect Type:	Ethernet		

### Interconnect Description: Omni-Path Architecture

Hardware		Software	
Vendor:	Intel		
Model:	Intel Omni-Path 100 Series		
Switch Model:	Intel Omni-Path 100 Series		
Number of Switches:	25		
Number of Ports:	48		
Data Rate:	100Gbps		
Firmware:	10.3.0.0.81		
Topology:	2:1 Blocking Fat tree		
Primary Use:	MPI traffic		



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## Interconnect Description: Gigabit Ethernet

Hardware		Software
Vendor:	Cisco	
Model:	Ethernet 40 Gbps	
Switch Model:	Cisco Nexus5020, N5K-C5020P-BF	
Number of Switches:	1	
Number of Ports:	96	
Data Rate:	40Gbps	
Firmware:	5.2(1)N1(9a)	
Topology:	Star	
Primary Use:	Cluster File System	

## Submit Notes

The config file option 'submit' was used.

## Base Compiler Invocation

C benchmarks:  
mpiicc

C++ benchmarks:

126.lammps: mpiicpc

Fortran benchmarks:  
mpiifort

Benchmarks using both Fortran and C:  
mpiicc mpiifort

## Base Portability Flags

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

## Base Optimization Flags

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

C++ benchmarks:

Continued on next page



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## Base Optimization Flags (Continued)

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

Fortran benchmarks:

-O3 -xCORE-AVX2 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX2 -no-prec-div

The flags file that was used to format this result can be browsed at

<http://www.spec.org/mpi2007/flags/RWTH-Aachen-CLAIX-MPI-2017-SEP.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/mpi2007/flags/RWTH-Aachen-CLAIX-MPI-2017-SEP.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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