



# SPEC® MPIM2007 Result

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## NEC

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

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 27.7

MPI2007 license: 055A

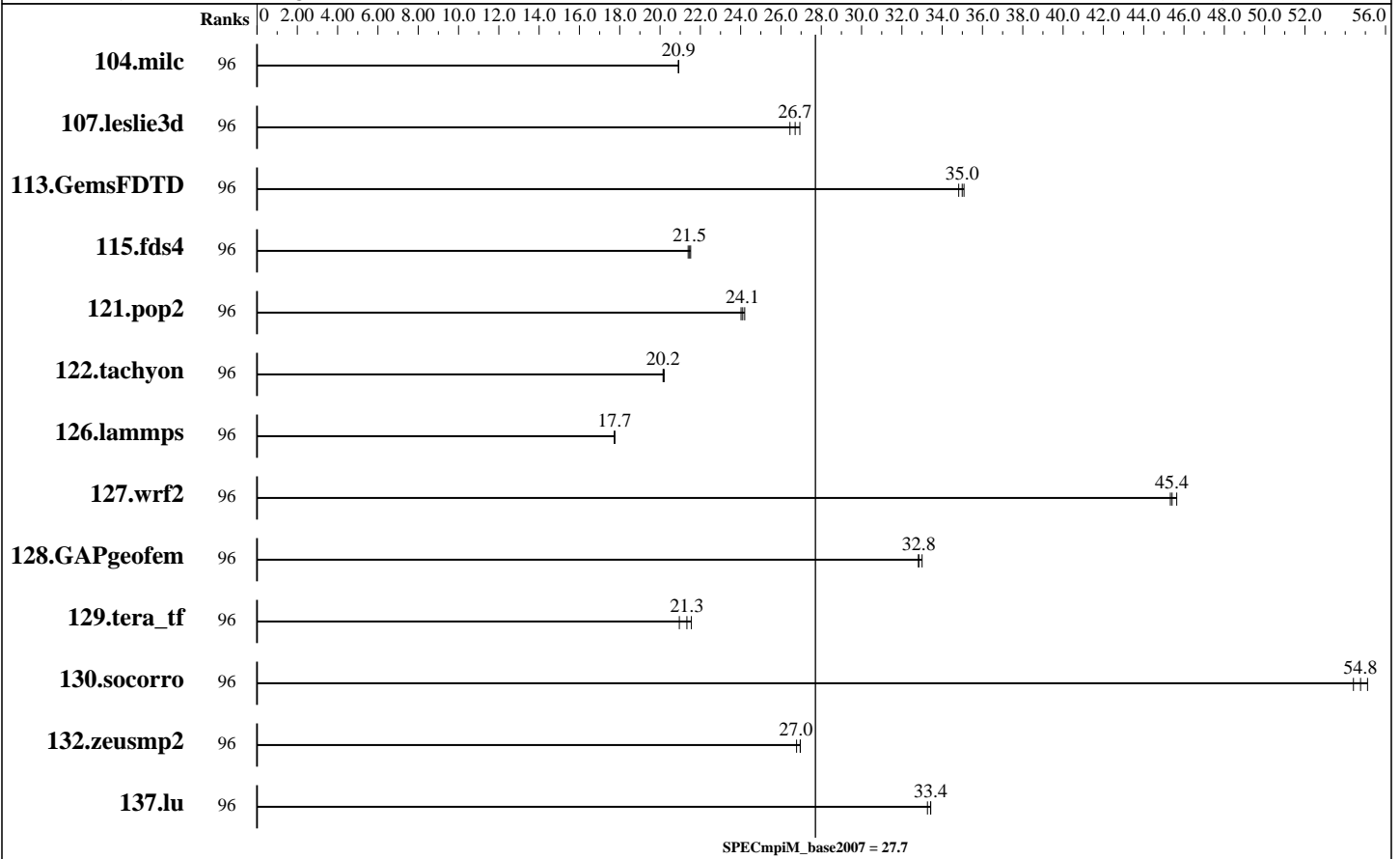
Test sponsor: RWTH University Aachen

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		
104.milc	96	<b><u>74.8</u></b>	<b><u>20.9</u></b>	74.9	20.9	74.8	20.9									
107.leslie3d	96	197	26.4	<b><u>195</u></b>	<b><u>26.7</u></b>	194	26.9									
113.GemsFDTD	96	180	35.1	181	34.8	<b><u>180</u></b>	<b><u>35.0</u></b>									
115.fds4	96	<b><u>90.9</u></b>	<b><u>21.5</u></b>	91.2	21.4	90.7	21.5									
121.pop2	96	<b><u>171</u></b>	<b><u>24.1</u></b>	172	24.0	171	24.2									
122.tachyon	96	138	20.2	139	20.2	<b><u>139</u></b>	<b><u>20.2</u></b>									
126.lammps	96	164	17.8	164	17.7	<b><u>164</u></b>	<b><u>17.7</u></b>									
127.wrf2	96	172	45.3	<b><u>172</u></b>	<b><u>45.4</u></b>	171	45.6									
128.GAPgeofem	96	<b><u>62.9</u></b>	<b><u>32.8</u></b>	62.9	32.8	62.6	33.0									
129.tera_tf	96	<b><u>130</u></b>	<b><u>21.3</u></b>	132	21.0	128	21.6									

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	<b>69.7</b>	<b>54.8</b>	70.2	54.4	69.3	55.1							
132.zeusmp2	96	116	26.8	<b>115</b>	<b>27.0</b>	115	27.0							
137.lu	96	<b>110</b>	<b>33.4</b>	110	33.4	110	33.3							

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: NEC HPC  
 Interconnects: Omni-Path Architecture(MPI)  
 Gigabit Ethernet  
 File Server Node: NFSv3  
 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: 12 core, 2.2 GHz, 9.6 GT/s QPI  
 Intel Turbo Boost Technology up to 2.9 GHz  
 Hyper-Threading Technology 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

### Software

Adapter: Intel Omni-Path Host Fabric Interface Adapter 100  
 Series 1 Port PCIe x8  
 Adapter Driver: Intel Omni-Path Host Fabric Interface  
 Adapter Firmware: 2.33.5100  
 Operating System: CentOS Linux release 7.3.1611 (Core)  
 Kernel 3.10.0-514.26.1.el7.x86\_64  
 Local File System: Linux/xfs  
 Shared File System: NFSv3  
 System State: Multi-User, run level 3  
 Other Software: None

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Tested by: Bo Wang

Software Availability: Oct-2016

### Node Description: NEC HPC

Number of Adapters: 1  
Slot Type: PCI-E x8  
Data Rate: 58Gb/s  
Ports Used: 1  
Interconnect Type: Omni-Path

### Node Description: NFSv3

**Hardware**

Number of nodes: 1  
Uses of the node: fileserver  
Vendor: NETAPP  
Model: FAS6240  
CPU Name: Intel Xeon CPU X5670  
CPU(s) orderable: 1-2 chips  
Chips enabled: 2  
Cores enabled: 12  
Cores per chip: 6  
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

**Software**

Adapter: 10 Gigabit Ethernet Controller IX1-SFP+

Adapter Driver: N/A  
Adapter Firmware: 1.8-0  
Operating System: NetApp Release 8.2.3P2 7-Mode  
Local File System: None  
Shared File System: NFSv3  
System State: Multi-User, run level 3  
Other Software: None

### Interconnect Description: Omni-Path Architecture(MPI)

**Hardware**

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

**Software**

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Software Availability: Oct-2016

### Interconnect Description: Omni-Path Architecture(MPI)

Firmware: 10.3.0.0.81  
Topology: 2:1 Blocking Fat tree  
Primary Use: MPI traffic

### 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.

### General Notes

130.socorro (base): "nullify\_ptrs" src.alt was used.

## Base Compiler Invocation

C benchmarks:  
mpiicc

C++ benchmarks:

126.lammps: mpiicpc

Fortran benchmarks:  
mpiifort

Benchmarks using both Fortran and C:  
mpiicc mpiifort



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## 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 -xCORE-AVX2 -no-prec-div

C++ benchmarks:

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).

Tested with SPEC MPI2007 v2.0.

Report generated on Wed Oct 18 13:13:45 2017 by SPEC MPI2007 PS/PDF formatter v1463.

Originally published on 18 October 2017.