



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 = 59.5

MPI2007 license: 055A

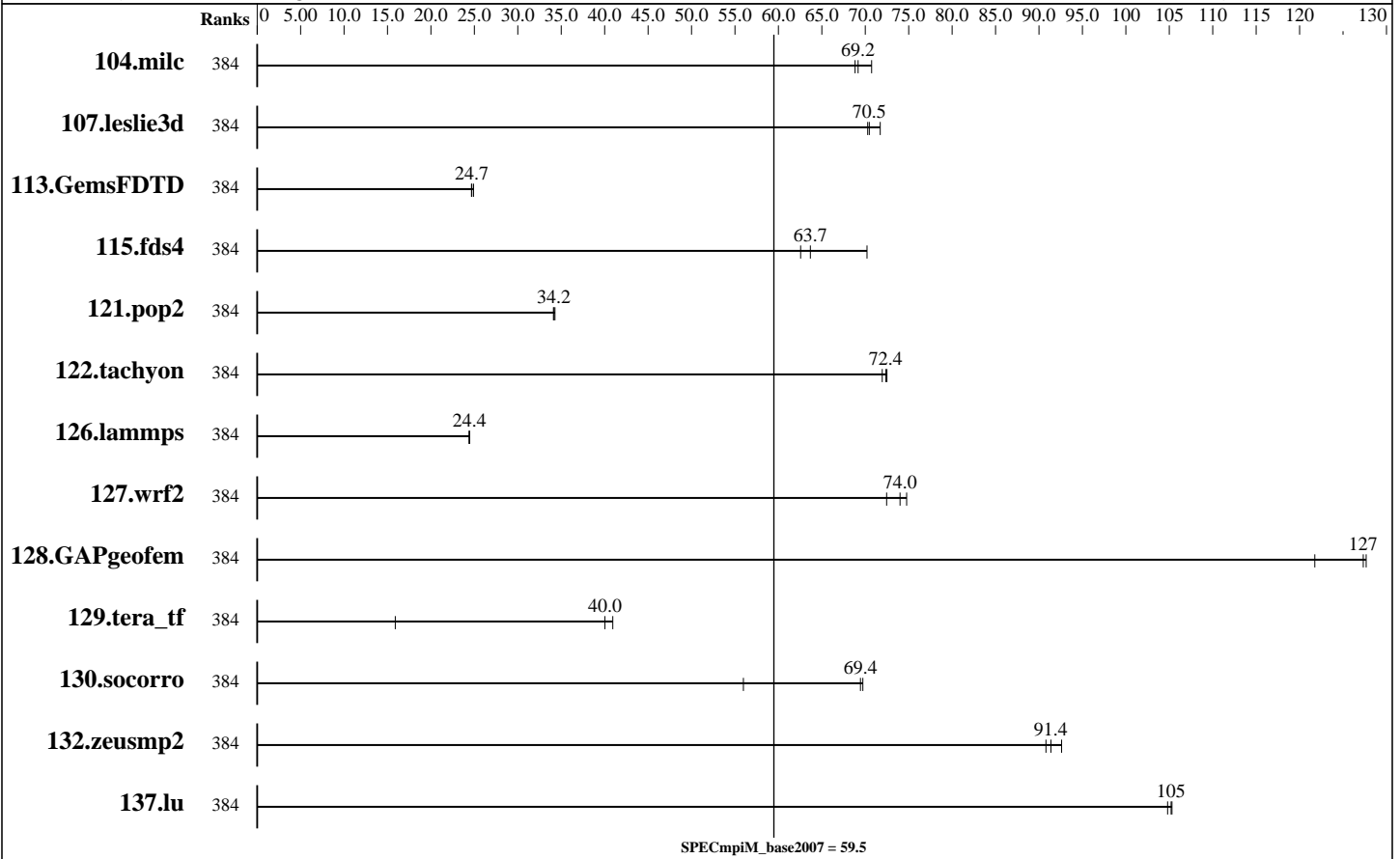
Test sponsor: RWTH University Aachen

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 | 384 | <u>22.6</u> | <u>69.2</u> | 22.1 | 70.7 | 22.7 | 68.8 | | | | | | | |
| 107.leslie3d | 384 | 74.3 | 70.3 | 72.8 | 71.7 | <u>74.1</u> | <u>70.5</u> | | | | | | | |
| 113.GemsFDTD | 384 | 253 | 24.9 | <u>255</u> | <u>24.7</u> | 256 | 24.7 | | | | | | | |
| 115.fds4 | 384 | <u>30.6</u> | <u>63.7</u> | 31.2 | 62.6 | 27.8 | 70.2 | | | | | | | |
| 121.pop2 | 384 | <u>121</u> | <u>34.2</u> | 120 | 34.3 | 121 | 34.1 | | | | | | | |
| 122.tachyon | 384 | <u>38.7</u> | <u>72.4</u> | 38.6 | 72.5 | 38.9 | 72.0 | | | | | | | |
| 126.lammps | 384 | 119 | 24.4 | 119 | 24.4 | <u>119</u> | <u>24.4</u> | | | | | | | |
| 127.wrf2 | 384 | 104 | 74.8 | <u>105</u> | <u>74.0</u> | 108 | 72.5 | | | | | | | |
| 128.GAPgeofem | 384 | 16.2 | 128 | <u>16.2</u> | <u>127</u> | 17.0 | 122 | | | | | | | |
| 129.tera_tf | 384 | <u>69.1</u> | <u>40.0</u> | 67.6 | 40.9 | 174 | 15.9 | | | | | | | |

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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| Benchmark | Base | | | | | | | Peak | | | | | | |
|-------------|-------|-------------|-------------|-------------|-------------|-------------|------------|-------|---------|-------|---------|-------|---------|-------|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 130.socorro | 384 | 54.7 | 69.7 | 55.0 | 69.4 | 68.2 | 56.0 | | | | | | | |
| 132.zeusmp2 | 384 | 34.0 | 91.4 | 34.2 | 90.8 | 33.5 | 92.6 | | | | | | | |
| 137.lu | 384 | 35.1 | 105 | 34.9 | 105 | 34.9 | 105 | | | | | | | |

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(I/O)
 File Server Node: NFSv3
 Total Compute Nodes: 16
 Total Chips: 32
 Total Cores: 384
 Total Threads: 768
 Total Memory: 2 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
 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: 16
 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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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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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(I/O)

| | 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 -xSSE4.2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xSSE4.2 -no-prec-div

Fortran benchmarks:

-O3 -xSSE4.2 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xSSE4.2 -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.

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