SPEC® MPIL2007 Result

Copyright 2006-2010 Standard Performance Evaluation Corporation

Intel Corporation

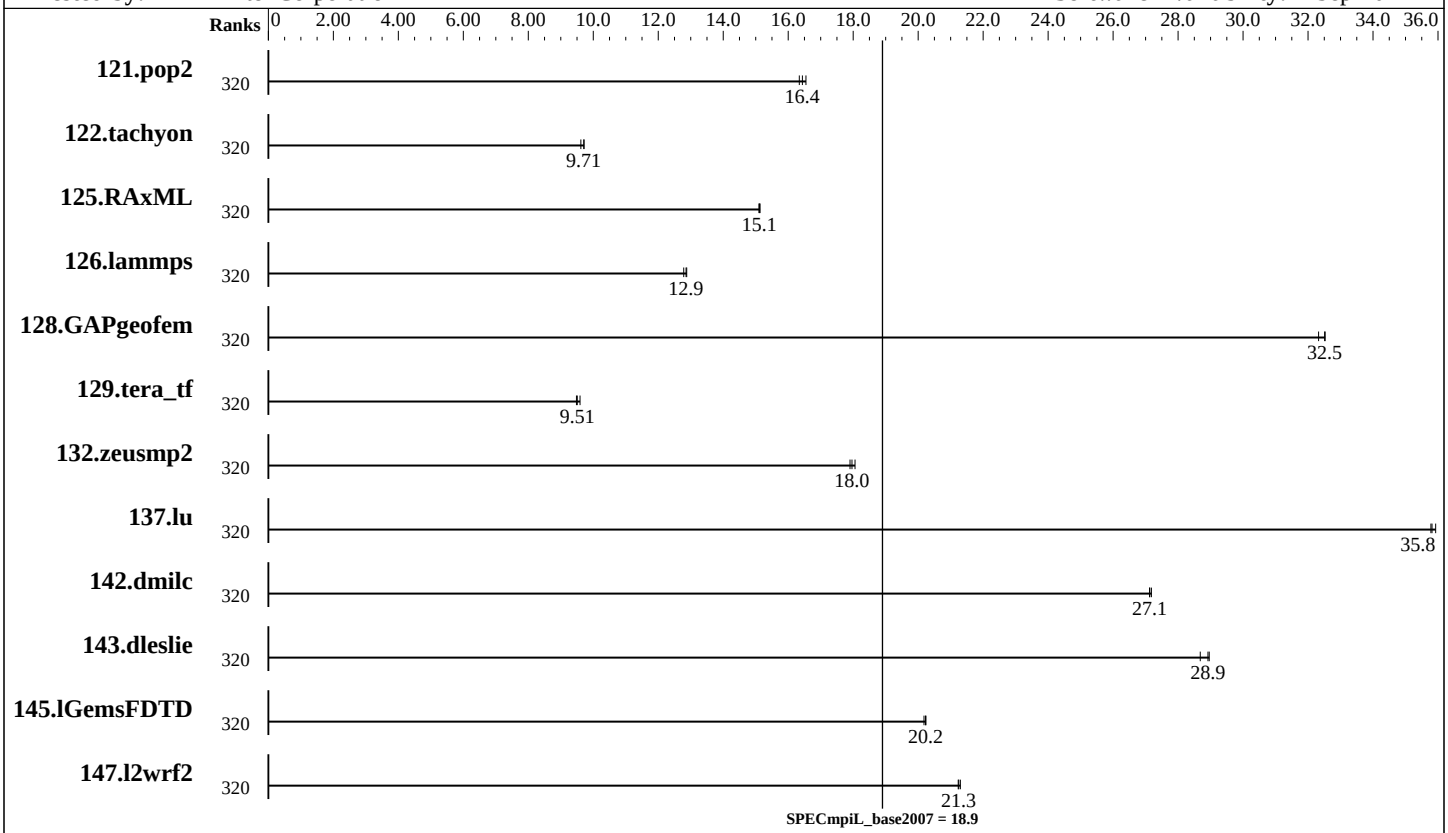
Intel Server System R2208WFTZS (Intel Xeon Gold 6148, 2.40 GHz)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 18.9

MPI2007 license: 13
Test sponsor: Intel Corporation
Tested by: Intel Corporation

Test date: Jul-2017
Hardware Availability: Jul-2017
Software Availability: Sep-2017



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	320	235	16.5	**237**	**16.4**	238	16.3							
122.tachyon	320	202	9.62	200	9.72	**200**	**9.71**							
125.RAxML	320	**193**	**15.1**	193	15.1	193	15.1							
126.lammps	320	191	12.9	192	12.8	**191**	**12.9**							
128.GAPgeofem	320	182	32.5	184	32.3	**183**	**32.5**							
129.tera_tf	320	115	9.59	**116**	**9.51**	116	9.48							
132.zeusmp2	320	**118**	**18.0**	118	17.9	117	18.1							
137.lu	320	117	35.8	**117**	**35.8**	117	35.9							
142.dmilc	320	136	27.1	**136**	**27.1**	136	27.2							
143.dleslie	320	107	29.0	108	28.7	**107**	**28.9**							
145.lGemsFDTD	320	218	20.2	219	20.2	**218**	**20.2**							
147.l2wrf2	320	**386**	**21.3**	386	21.2	385	21.3							

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:	Endeavor Node
Interconnects:	Intel Omni-Path Intel Omni-Path
File Server Node:	Lustre FS
Total Compute Nodes:	8
Total Chips:	16
Total Cores:	320
Total Threads:	640
Total Memory:	1536 GB
Base Ranks Run:	320
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--

Software Summary

C Compiler:	Intel C++ Composer XE 2017 for Linux Version 17.0.4.196 Build 20170411
C++ Compiler:	Intel C++ Composer XE 2017 for Linux Version 17.0.4.196 Build 20170411
Fortran Compiler:	Intel Fortran Composer XE 2017 for Linux Version 17.0.4.196 Build 20170411
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
MPI Library:	Intel MPI Library 17u4 for Linux
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: Endeavor Node

Hardware

Number of nodes:	8
Uses of the node:	compute
Vendor:	Intel
Model:	Intel Server System R2208WFTZS (Intel Xeon Gold 6148, 2.4 GHz)
CPU Name:	Intel Xeon Gold 6148
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	40
Cores per chip:	20
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.7 GHz
CPU MHz:	2400
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	27.5 MB I+D on chip per chip
Other Cache:	None
Memory:	192 GB (12 x 16 GB 2Rx4 DDR4-2666 ECC Registered)
Disk Subsystem:	1 x 800 GB SSD (INTEL SSDSC2BA80)
Other Hardware:	None
Adapter:	Intel Omni-Path Fabric Adapter 100 series
Number of Adapters:	1
Slot Type:	PCI-Express x16
Data Rate:	12.5 GB/s
Ports Used:	1
Interconnect Type:	Intel Omni-Path Fabric Adapter 100 series
Adapter:	Intel Omni-Path Edge Switch 100 series
Number of Adapters:	1
Slot Type:	PCI-Express x16
Data Rate:	12.5 GB/s
Ports Used:	1
Interconnect Type:	Intel Omni-Path Fabric Adapter 100 series

Software

Adapter:	Intel Omni-Path Fabric Adapter 100 series
Adapter Driver:	IFS 10.4
Adapter Firmware:	0.9-46
Adapter:	Intel Omni-Path Edge Switch 100 series
Adapter Driver:	IFS 10.4
Adapter Firmware:	0.9-46
Operating System:	Oracle Linux Server release 7.3, Kernel 3.10.0-514.6.2.0.1.el7.x86_64.knl1
Local File System:	Linux/xfs
Shared File System:	LFS
System State:	Multi-User
Other Software:	IBM Platform LSF Standard 9.1.1.1

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Hardware Availability: Jul-2017
Software Availability: Sep-2017

Node Description: Lustre FS

Hardware

Number of nodes:	11
Uses of the node:	fileserver
Vendor:	Intel
Model:	Intel Server System R2224GZ4GC4
CPU Name:	Intel Xeon E5-2680
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	16
Cores per chip:	8
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology disabled
CPU MHz:	2700
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	2 MB I+D on chip per chip
L3 Cache:	20 MB I+D on chip per chip
Other Cache:	None
Memory:	64 GB (8 x 8GB 1600MHz Reg ECC DDR3)
Disk Subsystem:	2.1 TB
Other Hardware:	None
Adapter:	Intel Omni-Path Fabric Adapter 100 series
Number of Adapters:	1
Slot Type:	PCI-Express x16
Data Rate:	12.5 GB/s
Ports Used:	1
Interconnect Type:	Intel Omni-Path Fabric Adapter 100 series

Software

Adapter:	Intel Omni-Path Fabric Adapter 100 series
Adapter Driver:	IFS 10.4
Adapter Firmware:	0.9-46
Operating System:	Redhat* Enterprise Linux* Server Release 7.2, Kernel 3.10.0-514.6.2.0.1.el7.x86_64.knl1
Local File System:	None
Shared File System:	Lustre FS
System State:	Multi-User
Other Software:	None

Interconnect Description: Intel Omni-Path

Hardware

Vendor:	Intel
Model:	Intel Omni-Path 100 series
Switch Model:	Intel Omni-Path Edge Switch 100 series
Number of Switches:	24
Number of Ports:	48
Data Rate:	12.5 GB/s
Firmware:	0.9-46
Topology:	Fat tree
Primary Use:	MPI traffic

Software

Interconnect Description: Intel Omni-Path

Hardware

Vendor:	Intel Corporation
Model:	Intel Omni-Path 100 series
Switch Model:	Intel Omni-Path Edge Switch 100 series
Number of Switches:	1
Number of Ports:	48
Data Rate:	12.5 GB/s
Firmware:	0.9-46
Topology:	Fat tree
Primary Use:	Cluster File System

Software

Submit Notes

```
The config file option 'submit' was used.
```

General Notes

```
MPI startup command:
  mpiexec.hydra command was used to start MPI jobs.
Software environment:
  export I_MPI_COMPATIBILITY=3
  export I_MPI_FABRICS=shm:tmi
  export I_MPI_HYDRA_PMI_CONNECT=alltoall
Network:
  Endeavour Omni-Path fabric consists of 48-port switches = 24 core switches
  connected to each leaf of the rack switch.
Job placement:
  Each MPI job was assigned to a topologically compact set of nodes, i.e.
  the minimal needed number of leaf switches was used for each job = 1 switch
  for 40/80/160/320/640 ranks, 2 switches for 1280 and 1980 ranks.
IBM Platform LSF was used for job submission. It has no impact on performance.
  Information can be found at: http://www.ibm.com
```

Base Compiler Invocation

C benchmarks:
`mpiicc`

C++ benchmarks:

126.lammps: `mpiicpc`

Fortran benchmarks:
`mpiifort`

Continued on next page

Base Compiler Invocation (Continued)

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-AVX512 -no-prec-div -ipo

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX512 -no-prec-div -ipo

Fortran benchmarks:
-O3 -xCORE-AVX512 -no-prec-div -ipo

Benchmarks using both Fortran and C:
-O3 -xCORE-AVX512 -no-prec-div -ipo

The flags file that was used to format this result can be browsed at
http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20170822.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20170822.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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