Intel

Intel Server System S9248WK1HLC (2 x Intel Xeon Platinum 9242, 2.3Ghz)

**SPECompG_peak2012 = 44.1**

**SPECompG_base2012 = 37.0**

<table>
<thead>
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<th>Intel</th>
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<td>Intel</td>
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</table>

**OMPG2012 license:** 13

**Test date:** Nov-2019

**Hardware Availability:** Jun-2019

**Software Availability:** Jan-2019

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**CPU Name:** Intel Xeon Platinum 9242

**CPU Characteristics:**
- Intel Turbo Boost Technology : Up to 3.80 Ghz
- 2300
- 3800

**CPU MHz:**
- 1,2 Chips

**CPU(s) enabled:**
- 96 cores, 2 chips, 48 cores/chip, 2 threads/core

**Primary Cache:**
- 32 KB I + 32 KB D on chip per core

**Secondary Cache:**
- 1 MB I+D on chip per core

**L3 Cache:**
- 71.5 MB I+D on chip per chip, 35.75 MB shared / 24 cores

**Other Cache:** None

**Memory:** 384 GB (24 x 16 GB 2Rx8 DDR4-2933Y-R)

**Disk Subsystem:** Panasas ActiveStor 14 (124TB connected via 10GB Ethernet)

**Operating System:** CentOS Linux release 7.7.1908 (Core)

**Compiler:**
- C/C++/Fortran: Version 19.0.2.187 of Intel Composer XE for Linux

**Auto Parallel:** No

**File System:** Linux ext3

**System State:** Run Level 3 (multi-user)

**Base Pointers:** 64-bit

**Peak Pointers:** 64-bit

**Other Software:** None

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Continued on next page
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**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Threads Run</th>
<th>Minimum Peak Threads</th>
<th>Maximum Peak Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>350.md</td>
<td>192</td>
<td>192</td>
<td>96</td>
<td>192</td>
</tr>
<tr>
<td>351.bwaves</td>
<td>192</td>
<td>192</td>
<td>96</td>
<td>192</td>
</tr>
<tr>
<td>352.nab</td>
<td>192</td>
<td>192</td>
<td>96</td>
<td>192</td>
</tr>
<tr>
<td>357.bt331</td>
<td>192</td>
<td>192</td>
<td>96</td>
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<tr>
<td>358.botsalgn</td>
<td>192</td>
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<td>96</td>
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</tr>
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<td>359.botsspar</td>
<td>192</td>
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<td>360.ilbdc</td>
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<td>192</td>
<td>96</td>
<td>192</td>
</tr>
<tr>
<td>362.fma3d</td>
<td>192</td>
<td>192</td>
<td>96</td>
<td>192</td>
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<tr>
<td>363.swim</td>
<td>192</td>
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</tr>
<tr>
<td>371.applu331</td>
<td>192</td>
<td>192</td>
<td>96</td>
<td>192</td>
</tr>
<tr>
<td>372.smithwa</td>
<td>192</td>
<td>192</td>
<td>96</td>
<td>192</td>
</tr>
<tr>
<td>376.kdtree</td>
<td>192</td>
<td>192</td>
<td>96</td>
<td>192</td>
</tr>
</tbody>
</table>

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

**Platform Notes**

Sysinfo program /global/panfs02/innl/aknyaze1/OMP2012/1.1/Docs/sysinfo
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)
running on eca063 Tue Nov 5 02:49:23 2019

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see: http://www.spec.org/omp2012/Docs/config.html#sysinfo

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Platinum 9242 CPU @ 2.30GHz
4 "physical id"s (chips)
192 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29

Continued on next page
Intel

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Intel

SPECompG_peak2012 = 44.1
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Platform Notes (Continued)

physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29

cache size : 36608 KB

From /proc/meminfo
MemTotal: 394837156 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
centos-release: CentOS Linux release 7.7.1908 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.7 (Source)
os-release:
NAME="CentOS Linux"
VERSION="7 (Core)"
ID="centos"
ID_LIKE="rhel fedora"
VERSION_ID="7"
PRETTY_NAME="CentOS Linux 7 (Core)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:centos:centos:7"
redhat-release: CentOS Linux release 7.7.1908 (Core)
system-release: CentOS Linux release 7.7.1908 (Core)
system-release-cpe: cpe:/o:centos:centos:7

uname -a:
Linux eca063 3.10.0-1062.4.1.el7.crt1.x86_64 #1 SMP Fri Oct 18 09:12:13 MDT 2019 x86_64 x86_64 x86_64 GNU/Linux

rmi-level 3 Nov 4 15:11

SPEC is set to: /global/panfs02/innl/aknyaze1/OMP2012/1.1
Filesystem  Type Size Used Avail Use% Mounted on
panfs://36.101.212.1/innl panfs 269T 145T 125T 54% /global/panfs02/innl

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

(End of data from sysinfo program)

General Notes

========================================================================
General base OMP Library Settings
ENV_KMP_AFFINITY=compact,0,granularity=fine,verbose

Continued on next page
General Notes (Continued)

General peak OMP Library Settings
   ENV_KMP_AFFINITY=compact,0,granularity=fine,verbose

Per benchmark peak OMP Library Settings

System settings notes:
   Intel Turbo Boost Technology (Turbo) : Enabled

General OMP Library Settings
   KMP_LIBRARY=turnaround
   KMP_STACKSIZE=292M
   KMP_BLOCKTIME=infinite
   OMP_DYNAMIC=FALSE
   OMP_NESTED=FALSE
   OMP_SCHEDULE=static

Spectre and Meltdown
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

351.bwaves:peak:
   ENV_KMP_AFFINITY=compact,1,granularity=fine,verbose

359.botsspar:peak:
   ENV_KMP_AFFINITY=compact,1,granularity=fine,verbose

363.swim:peak:
   ENV_KMP_AFFINITY=compact,1,granularity=fine,verbose

367.imagick:peak:
   ENV_KMP_AFFINITY=compact,1,granularity=fine,verbose

370.mgrid331:peak:
   ENV_KMP_AFFINITY=compact,1,granularity=fine,verbose

Compiler: Fortran: Version 19.0.3.199 of Intel Composer XE for Linux
Intel

Intel Server System S9248WK1HLC (2 x Intel Xeon Platinum 9242, 2.3Ghz)

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OMP2012 license:13
Test sponsor: Intel
Tested by: Intel

Test date: Nov-2019
Hardware Availability: Jun-2019
Software Availability: Jan-2019

Base Compiler Invocation

C benchmarks:
  icc
C++ benchmarks:
  icpc
Fortran benchmarks:
  ifort

Base Portability Flags

  350.md: -FR
  357.bt331: -mcmodel=medium
  363.swim: -mcmodel=medium
  367.imagick: -std=c99

Base Optimization Flags

C benchmarks:
  -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
  -ansi-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=0

C++ benchmarks:
  -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
  -ansi-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=0

Fortran benchmarks:
  -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
  -ansi-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=0
  -align all

Peak Compiler Invocation

C benchmarks:
  icc
C++ benchmarks:
  icpc
Fortran benchmarks (except as noted below):
  ifort

  371.applu331: /opt/intel/compiler/2019u3/bin/ifort
SPEC OMPG2012 Result

Intel

Intel Server System  S9248WK1HLC (2 x Intel Xeon Platinum 9242, 2.3Ghz)

SPECompG_peak2012 = 44.1
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Peak Portability Flags

350.md: -FR
357.bt331: -mcmodel=medium
363.swim: -mcmodel=medium
367.imagick: -std=c99

Peak Optimization Flags

C benchmarks:

352.nab: -O3 -gopenmp -xCORE-AVX512 -qopt-zmm-usage=high
         -fp-model fast=2 -ansi-alias -no-prec-div -no-prec-sqrt
         -ipo -qopt-prefetch=0

358.botsalign: -O3 -gopenmp -xCORE-AVX512 -qopt-zmm-usage=high
                -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt

359.botsspar: Same as 358.botsalign

367.imagick: -O3 -gopenmp -xCORE-AVX512 -qopt-zmm-usage=high
              -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -ipo

372.smithwa: Same as 352.nab

C++ benchmarks:

-03 -gopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
     -fno-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=1

Fortran benchmarks:

350.md: -O3 -gopenmp -xCORE-AVX512 -qopt-zmm-usage=high
         -fp-model fast=2 -ansi-alias -no-prec-div -no-prec-sqrt
         -ipo -qopt-prefetch=0 -align all

351.bwaves: -O3 -gopenmp -xCORE-AVX512 -qopt-zmm-usage=high
              -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
              -ipo -qopt-prefetch=2 -align all

357.bt331: -O3 -gopenmp -xCORE-AVX512 -qopt-zmm-usage=high
            -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
            -ipo -qopt-prefetch=1 -align all

360.ilbdc: -O3 -gopenmp -xCORE-AVX512 -qopt-zmm-usage=high
            -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
            -ipo -qopt-prefetch=4 -align all

362.fma3d: Same as 350.md

Continued on next page
**Intel**

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**Peak Optimization Flags (Continued)**

363.swim: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high  
-fp-model fast=2 -no-prec-div -no-prec-sqrt -fno-alias  
-qopt-malloc-options=3 -ipo -qopt-prefetch=0 -align all

370.mgrid331: -O3 -qopenmp -xCORE-AVX2 -fp-model fast=2 -no-prec-div  
-no-prec-sqrt -fno-alias -qopt-malloc-options=3 -ipo  
-qopt-prefetch=0 -align all

371.applu331: Same as 350.md

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

http://www.spec.org/omp2012/flags/Intel-ic19-linux64.20191218.html

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

http://www.spec.org/omp2012/flags/Intel-ic19-linux64.20191218.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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