## SPEC® OMPG2012 Result

### Intel

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

**SPECompG_peak2012** = 43.8  
**SPECompG_base2012** = 36.9

<table>
<thead>
<tr>
<th>OMP2012 license:13</th>
<th>Intel Server System S9248WK1HLC (2 x Intel Xeon Platinum, 2.3 Ghz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Intel</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Intel</td>
</tr>
<tr>
<td>Test date:</td>
<td>Jun-2019</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jan-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jun-2019</td>
</tr>
</tbody>
</table>

### Threads

| Threads | 0 | 10.0 | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 |
|---------|---|------|------|------|------|------|------|------|------|------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 350.md  | 92 | 192  | 39.4 | 40.5 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 351.bwaves | 96 | 192  | 28.6 | 37.5 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 352.nab  | 92 | 192  | 28.6 | 30.8 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 357.bt331| 92 | 192  | 37.5 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 358.botsalgn | 96 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 359.botsspar | 96 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 360.ilbdc | 92 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 362.fma3d | 92 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 363.swim  | 96 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 367.imagick | 96 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 370.mgrid331 | 96 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 371.applu331 | 92 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 372.smithwa | 92 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 376.kdtree | 92 | 192  | 28.6 | 31.9 | 30.8 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

**SPECompG_base2012** = 36.9  
**SPECompG_peak2012** = 43.8

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Platinum 9242</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology : Up to 3.80 Ghz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2200</td>
</tr>
<tr>
<td>CPU MHz Maximum:</td>
<td>3800</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>96 cores, 2 chips, 48 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 Chips</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>71.5 MB I+D on chip per chip, 35.75 MB shared / 24 cores</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>384 GB (24 x 16 GB 2Rx8 DDR4-2933Y-R)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>N/A</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>--</td>
</tr>
<tr>
<td>Base Threads Run:</td>
<td>192</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>CentOS Linux release 7.6.1810 (Core)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++/Fortran: Version 19.0.2.187 of Intel Composer XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>File System:</td>
<td>ext3</td>
</tr>
<tr>
<td>System State:</td>
<td>Run Level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other Software:</td>
<td>None</td>
</tr>
</tbody>
</table>

---

Continued on next page
Intel Server System S9248WK1HLC (2 x Intel Xeon 9242, Platinum, 2.3 Ghz)

**SPECompG_peak2012** = 43.8
**SPECompG_base2012** = 36.9

Test sponsor: Intel  
Hardware Availability: Jun-2019

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

Minimum Peak Threads: 96  
Maximum Peak Threads: 192

---

## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>350.md</td>
<td>192</td>
<td>16.9</td>
<td>274</td>
<td>17.4</td>
<td>267</td>
<td>16.8</td>
<td>276</td>
<td>192</td>
<td>16.7</td>
<td>278</td>
<td>16.8</td>
</tr>
<tr>
<td>351.bwaves</td>
<td>192</td>
<td>114</td>
<td>39.7</td>
<td>116</td>
<td>39.2</td>
<td>115</td>
<td>39.4</td>
<td>96</td>
<td>112</td>
<td>40.6</td>
<td>112</td>
</tr>
<tr>
<td>352.nab</td>
<td>192</td>
<td>136</td>
<td>28.6</td>
<td>137</td>
<td>28.3</td>
<td>135</td>
<td>28.8</td>
<td>192</td>
<td>135</td>
<td>28.8</td>
<td>135</td>
</tr>
<tr>
<td>357.bt331</td>
<td>192</td>
<td>130</td>
<td>36.5</td>
<td>126</td>
<td>37.5</td>
<td>127</td>
<td>37.2</td>
<td>192</td>
<td>118</td>
<td>40.2</td>
<td>118</td>
</tr>
<tr>
<td>358.botsalgn</td>
<td>192</td>
<td>141</td>
<td>30.8</td>
<td>141</td>
<td>30.8</td>
<td>141</td>
<td>30.8</td>
<td>96</td>
<td>36.7</td>
<td>143</td>
<td>36.9</td>
</tr>
<tr>
<td>360.ilbdc</td>
<td>192</td>
<td>138</td>
<td>25.8</td>
<td>139</td>
<td>25.7</td>
<td>141</td>
<td>25.3</td>
<td>192</td>
<td>140</td>
<td>25.4</td>
<td>139</td>
</tr>
<tr>
<td>362.fm3d</td>
<td>192</td>
<td>262</td>
<td>14.5</td>
<td>249</td>
<td>15.3</td>
<td>237</td>
<td>16.0</td>
<td>192</td>
<td>256</td>
<td>14.9</td>
<td>329</td>
</tr>
<tr>
<td>363.swim</td>
<td>192</td>
<td>153</td>
<td>29.6</td>
<td>154</td>
<td>29.3</td>
<td>152</td>
<td>29.8</td>
<td>96</td>
<td>145</td>
<td>31.3</td>
<td>145</td>
</tr>
<tr>
<td>367.imagick</td>
<td>192</td>
<td>133</td>
<td>53.1</td>
<td>132</td>
<td>53.2</td>
<td>132</td>
<td>53.5</td>
<td>96</td>
<td>115</td>
<td>61.2</td>
<td>114</td>
</tr>
<tr>
<td>370.mgrid331</td>
<td>192</td>
<td>165</td>
<td>26.8</td>
<td>165</td>
<td>26.7</td>
<td>167</td>
<td>26.5</td>
<td>96</td>
<td>159</td>
<td>27.9</td>
<td>159</td>
</tr>
<tr>
<td>371.applu331</td>
<td>192</td>
<td>138</td>
<td>44.0</td>
<td>166</td>
<td>36.4</td>
<td>158</td>
<td>38.3</td>
<td>192</td>
<td>163</td>
<td>37.1</td>
<td>147</td>
</tr>
<tr>
<td>372.smithwa</td>
<td>192</td>
<td>76.0</td>
<td>70.5</td>
<td>76.0</td>
<td>70.6</td>
<td>76.0</td>
<td>70.5</td>
<td>192</td>
<td>75.9</td>
<td>70.6</td>
<td>77.1</td>
</tr>
<tr>
<td>376.kdtree</td>
<td>192</td>
<td>164</td>
<td>27.5</td>
<td>163</td>
<td>27.5</td>
<td>163</td>
<td>27.5</td>
<td>192</td>
<td>158</td>
<td>28.4</td>
<td>159</td>
</tr>
</tbody>
</table>

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

---

### Platform Notes

The system used pre-release CPUs running at 2200 MHz instead of the nominal base frequency (2300 MHz).  
Sysinfo program /nfs/pdx/home/aknyaze1/OMP2012/1.1/Docs/sysinfo  
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)  
running on ortce-clxap2 Tue Jun  4 08:41:42 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 : Genuine Intel(R) CPU 0000%@
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 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29  
physical 1: cores 0 1 2 3 4 5 6 8 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

Continued on next page
Intel

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

<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>physical 2: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29</td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>cache size : 36608 KB</td>
</tr>
</tbody>
</table>

From /proc/meminfo
MemTotal: 394795892 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
centos-release: CentOS Linux release 7.6.1810 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.6 (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 7.6.1810 (Core)
system-release: CentOS Linux release 7.6.1810 (Core)
system-release-cpe: cpe:/o:centos:centos:7

uname -a:
Linux ortce-clxap2 3.10.0-957.10.1.el7.x86_64 #1 SMP Mon Mar 18 15:06:45 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Apr 25 12:54

SPEC is set to: /nfs/pdx/home/aknyaze1/OMP2012/1.1

Filesystem Type Size Used Avail Use% Mounted on
cthor-fsl.jf.intel.com:/home/aknyaze1 nfs 29T 16T 13T 55%
/nfs/pdx/home/aknyaze1

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)
Intel

Intel Server System S9248WK1HL C (2 x Intel Xeon 9242
Platinum, 2.3 Ghz)

SPECompG_peak2012 = 43.8
SPECompG_base2012 = 36.9

General Notes

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

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

Continued on next page
SPEC OMPG2012 Result

Intel

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

SPECompG_peak2012 = 43.8
SPECompG_base2012 = 36.9

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

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

General Notes (Continued)

371.applu331:peak:
Compiler: Fortran: Version 19.0.3.199 of Intel Composer XE for Linux

Base Compiler Invocation

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

Base Portability Flags

350.md: -FR
357.bat331: -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

Continued on next page
**Intel**

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

<table>
<thead>
<tr>
<th>OMP2012 license:</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Intel</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Intel</td>
</tr>
</tbody>
</table>

**SPECompG_peak2012 = 43.8**  
**SPECompG_base2012 = 36.9**

**Peak Compiler Invocation (Continued)**

Fortran benchmarks (except as noted below):

```
ifort
371.aplu331: /opt/intel/compilers_and_libraries_2019.3.199/linux/bin/intel64/ifort
```

**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 -qopenmp -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 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
```

```
359.botspar: Same as 358.botsalign
```

```
```

```
372.smithwa: Same as 352.nab
```

C++ benchmarks:

```
-O3 -qopenmp -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 -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
```

```
351.bwaves: -O3 -qopenmp -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 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=1 -align all
```

Continued on next page
Intel

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

SPECompG_peak2012 = 43.8
SPECompG_base2012 = 36.9

Peak Optimization Flags (Continued)

360.ilbdc: -O3 -qopenmp -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 357.bt331

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

The flags file that was used to format this result can be browsed at
http://www.spec.org/omp2012/flags/Intel-ic19-linux64.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/omp2012/flags/Intel-ic19-linux64.xml

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC OMP2012 v1.1.
Originally published on 3 July 2019.