



# SPEC® OMPG2012 Result

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## Intel

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

SPECompG\_peak2012 = 38.5

SPECompG\_base2012 = 32.6

OMP2012 license:13

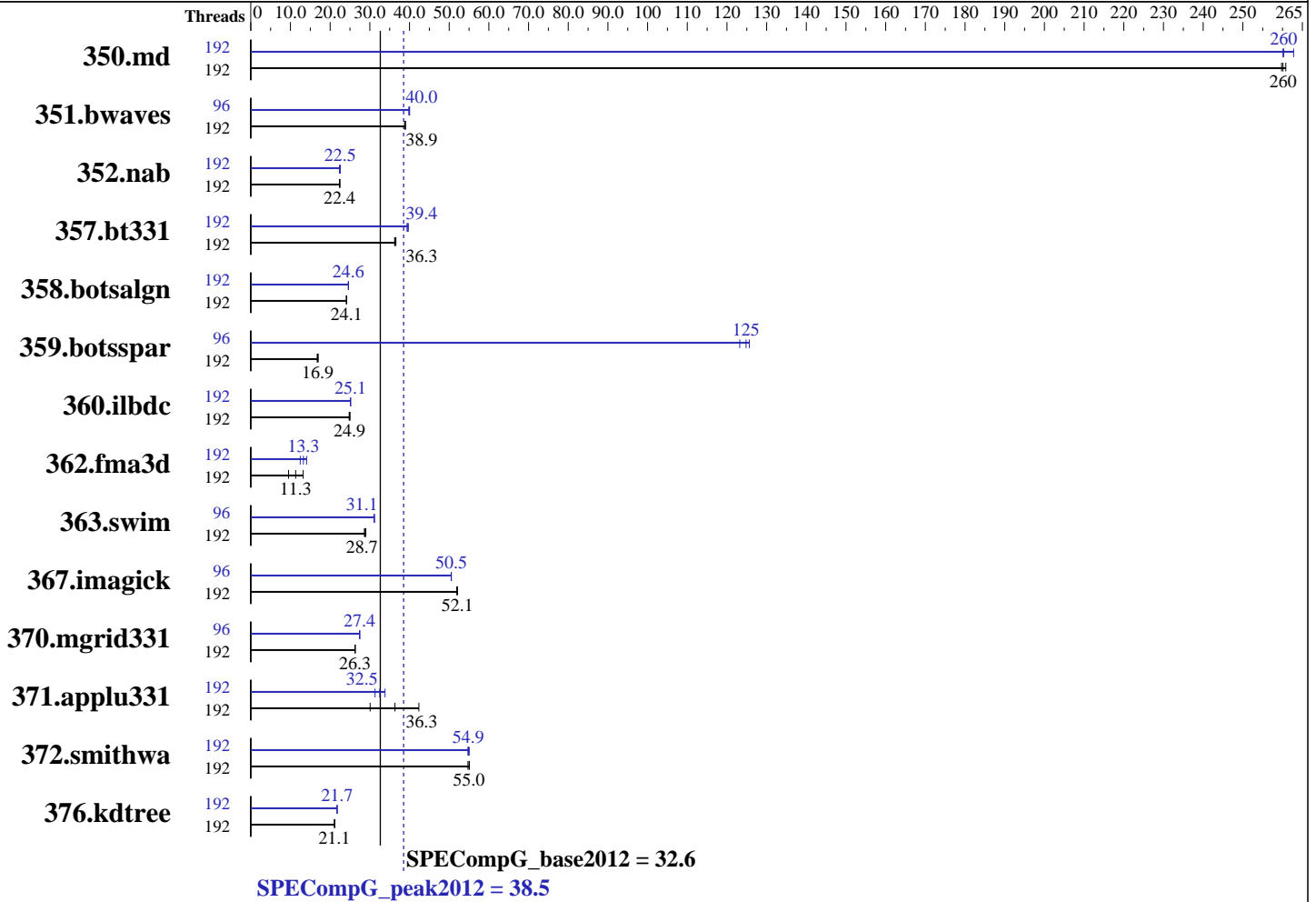
Test sponsor: Intel

Tested by: Intel

Test date: Jun-2019

Hardware Availability: Jun-2019

Software Availability: Jan-2019



### Hardware

CPU Name: Intel Xeon Platinum 9242  
 CPU Characteristics: Intel Turbo Boost Technology : Disabled  
 CPU MHz: 2200  
 CPU MHz Maximum: 2200  
 FPU: Integrated  
 CPU(s) enabled: 96 cores, 2 chips, 48 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 Chips  
 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 DDR4-2993Y-R)  
 Disk Subsystem: N/A  
 Other Hardware: --  
 Base Threads Run: 192

Continued on next page

### Software

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



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Minimum Peak Threads: 96  
Maximum Peak Threads: 192

## Results Table

Benchmark	Base						Peak							
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	192	<b>17.8</b>	<b>260</b>	17.8	260	17.8	261	192	17.6	263	<b>17.8</b>	<b>260</b>	17.8	260
351.bwaves	192	117	38.8	116	39.0	<b>116</b>	<b>38.9</b>	96	113	40.0	<b>113</b>	<b>40.0</b>	114	39.8
352.nab	192	174	22.4	<b>174</b>	<b>22.4</b>	173	22.5	192	173	22.5	<b>173</b>	<b>22.5</b>	174	22.4
357.bt331	192	131	36.3	<b>130</b>	<b>36.3</b>	130	36.6	192	119	39.7	120	39.4	<b>120</b>	<b>39.4</b>
358.botsalgn	192	180	24.1	180	24.1	<b>180</b>	<b>24.1</b>	192	<b>177</b>	<b>24.6</b>	177	24.6	177	24.6
359.botsspar	192	<b>311</b>	<b>16.9</b>	309	17.0	314	16.7	96	42.6	123	41.8	126	<b>42.1</b>	<b>125</b>
360.ilbdc	192	142	25.0	<b>143</b>	<b>24.9</b>	144	24.8	192	<b>142</b>	<b>25.1</b>	142	25.1	141	25.2
362.fma3d	192	399	9.52	<b>336</b>	<b>11.3</b>	288	13.2	192	270	14.1	<b>286</b>	<b>13.3</b>	305	12.5
363.swim	192	156	29.0	<b>158</b>	<b>28.7</b>	158	28.7	96	<b>146</b>	<b>31.1</b>	146	31.1	145	31.2
367.imagick	192	<b>135</b>	<b>52.1</b>	135	52.1	135	51.9	96	139	50.5	<b>139</b>	<b>50.5</b>	139	50.6
370.mgrid331	192	<b>168</b>	<b>26.3</b>	168	26.3	168	26.3	96	<b>161</b>	<b>27.4</b>	161	27.4	161	27.5
371.applu331	192	201	30.1	<b>167</b>	<b>36.3</b>	143	42.4	192	<b>186</b>	<b>32.5</b>	194	31.3	179	33.8
372.smithwa	192	<b>97.4</b>	<b>55.0</b>	97.9	54.7	97.3	55.1	192	<b>97.7</b>	<b>54.9</b>	97.4	55.1	97.9	54.7
376.kdtree	192	213	21.1	213	21.1	<b>213</b>	<b>21.1</b>	192	<b>207</b>	<b>21.7</b>	207	21.7	207	21.8

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/aknyazel/OMP2012/1.1/Docs/sysinfo  
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)  
running on ortce-clxap2 Tue Jun 4 12:33:34 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
```

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### Platform Notes (Continued)

```

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
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:      394796308 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 Jun 4 12:22

```

SPEC is set to: /nfs/pdx/home/aknyazel/OMP2012/1.1
Filesystem                                Type      Size      Used Avail Use% Mounted on
cthor-fs1.jf.intel.com:/home/aknyazel    nfs       29T       16T   13T   55%
/nfs/pdx/home/aknyazel

```

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)



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## 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) : Disabled

=====  
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

=====  
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## General Notes (Continued)

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.bt331: -mmodel=medium  
363.swim: -mmodel=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

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## Peak Compiler Invocation (Continued)

Fortran benchmarks (except as noted below):

ifort

371.applu331: /opt/intel/compilers\_and\_libraries\_2019.3.199/linux/bin/intel64/ifort

## Peak Portability Flags

350.md: -FR  
357.bt331: -mcmmodel=medium  
363.swim: -mcmmodel=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.botsalgn: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high  
-fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt

359.botsspar: Same as 358.botsalgn

367.imagick: -O3 -qopenmp -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:

-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

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## 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 350.md

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.aplu331: 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>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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