SPEC® OMPG2012 Result

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Intel

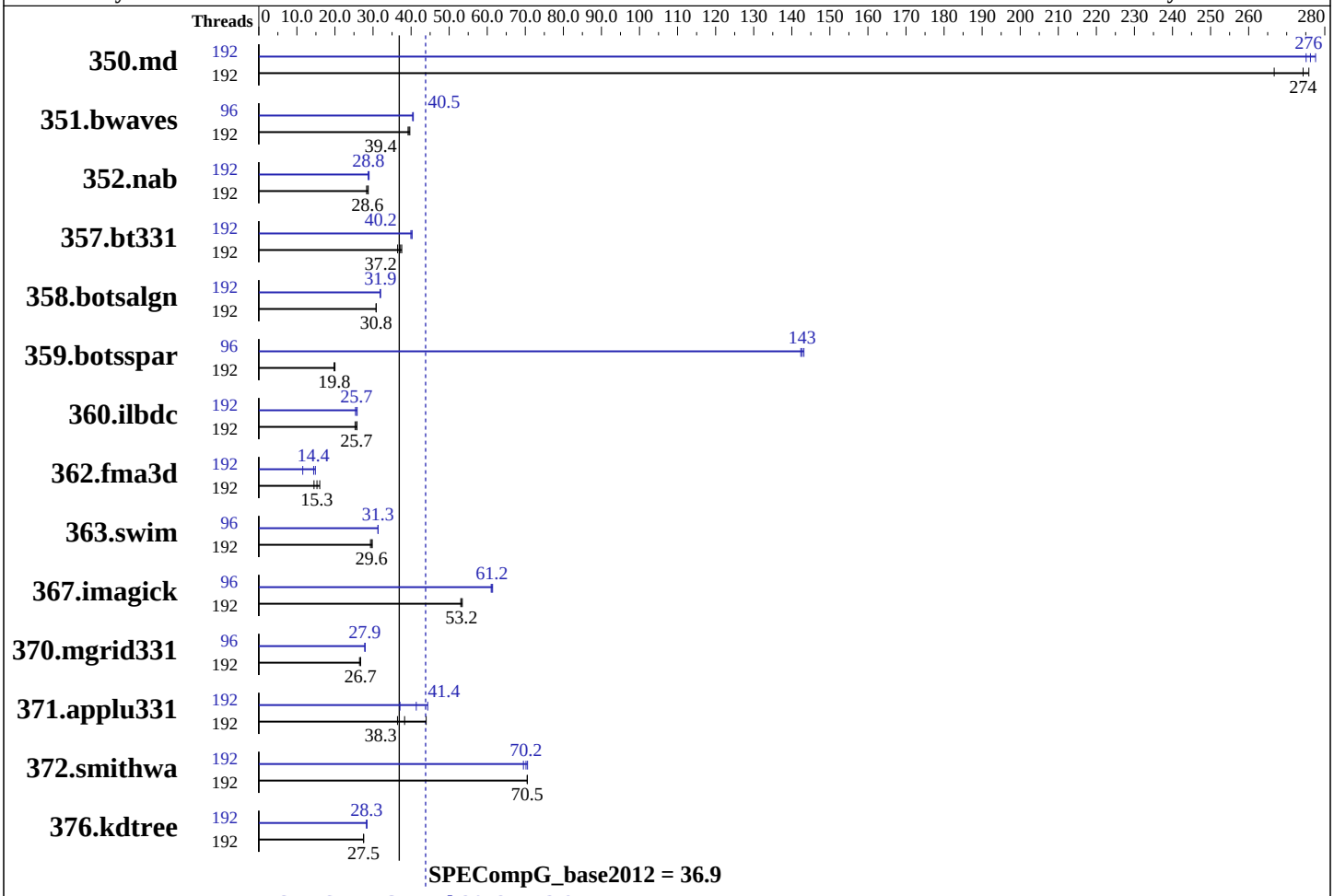
Intel Server System S9248WK1HLC (2 x Intel Xeon 9242 Platinum, 2.3 Ghz)

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



Hardware

CPU Name:	Intel Xeon Platinum 9242
CPU Characteristics:	Intel Turbo Boost Technology : Up to 3.80 Ghz
CPU MHz:	2200
CPU MHz Maximum:	3800
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

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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	**16.9**	**274**	17.4	267	16.8	276	192	16.7	278	**16.8**	**276**	16.8	275
351.bwaves	192	114	39.7	116	39.2	**115**	**39.4**	96	112	40.6	112	40.4	**112**	**40.5**
352.nab	192	**136**	**28.6**	137	28.3	135	28.8	192	**135**	**28.8**	135	28.7	134	29.0
357.bt331	192	130	36.5	126	37.5	**127**	**37.2**	192	**118**	**40.2**	118	40.2	119	39.9
358.botsalgn	192	**141**	**30.8**	141	30.8	141	30.8	192	**136**	**31.9**	136	31.9	136	31.9
359.botsspar	192	262	20.0	**265**	**19.8**	265	19.8	96	36.7	143	36.9	142	**36.8**	**143**
360.ilbdc	192	138	25.8	**139**	**25.7**	141	25.3	192	140	25.4	**139**	**25.7**	138	25.8
362.fma3d	192	262	14.5	**249**	**15.3**	237	16.0	192	256	14.9	329	11.5	**264**	**14.4**
363.swim	192	**153**	**29.6**	154	29.3	152	29.8	96	**145**	**31.3**	145	31.3	145	31.3
367.imagick	192	133	53.1	**132**	**53.2**	132	53.5	96	**115**	**61.2**	114	61.4	115	61.0
370.mgrid331	192	165	26.8	**165**	**26.7**	167	26.5	96	**159**	**27.9**	159	27.9	158	27.9
371.applu331	192	138	44.0	166	36.4	**158**	**38.3**	192	163	37.1	**147**	**41.4**	137	44.4
372.smithwa	192	**76.0**	**70.5**	76.0	70.6	76.0	70.5	192	75.9	70.6	77.1	69.5	**76.4**	**70.2**
376.kdtree	192	164	27.5	163	27.5	**163**	**27.5**	192	158	28.4	159	28.3	**159**	**28.3**

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

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:       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-fs1.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)
```

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

================================================================================
```

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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.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`

Continued on next page

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: -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.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 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`

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For other inquiries, please contact webmaster@spec.org.

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