SPEC® OMPG2012 Result

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Intel

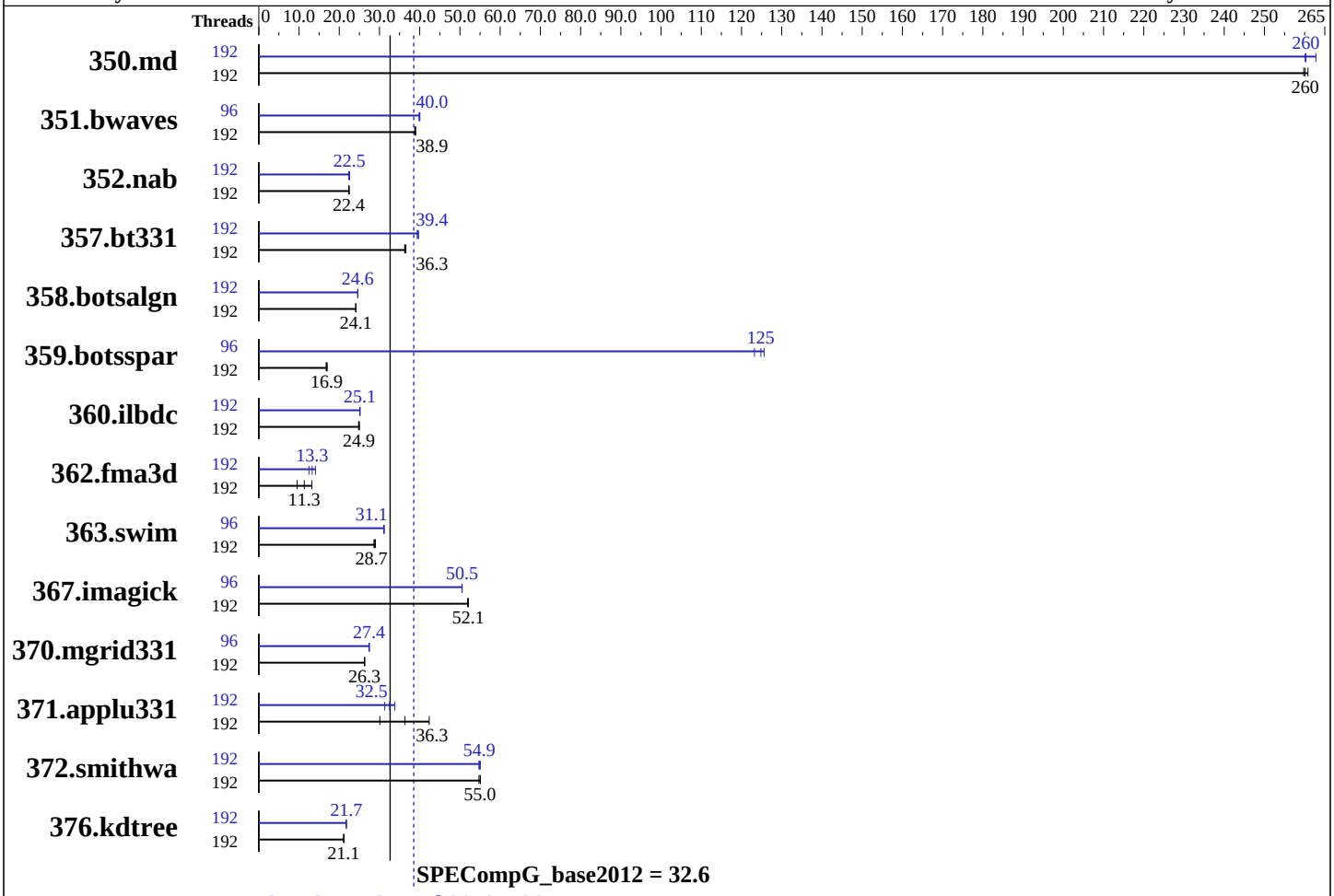
Intel Server System S9248WK1HLC (2 x Intel Xeon 9242 Platinum, 2.3 Ghz)

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

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

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	**17.8**	**260**	17.8	260	17.8	261	192	17.6	263	**17.8**	**260**	17.8	260
351.bwaves	192	117	38.8	116	39.0	**116**	**38.9**	96	113	40.0	**113**	**40.0**	114	39.8
352.nab	192	174	22.4	**174**	**22.4**	173	22.5	192	173	22.5	**173**	**22.5**	174	22.4
357.bt331	192	131	36.3	**130**	**36.3**	130	36.6	192	119	39.7	120	39.4	**120**	**39.4**
358.botsalgn	192	180	24.1	180	24.1	**180**	**24.1**	192	**177**	**24.6**	177	24.6	177	24.6
359.botsspar	192	**311**	**16.9**	309	17.0	314	16.7	96	42.6	123	41.8	126	**42.1**	**125**
360.ilbdc	192	142	25.0	**143**	**24.9**	144	24.8	192	**142**	**25.1**	142	25.1	141	25.2
362.fma3d	192	399	9.52	**336**	**11.3**	288	13.2	192	270	14.1	**286**	**13.3**	305	12.5
363.swim	192	156	29.0	**158**	**28.7**	158	28.7	96	**146**	**31.1**	146	31.1	145	31.2
367.imagick	192	**135**	**52.1**	135	52.1	135	51.9	96	139	50.5	**139**	**50.5**	139	50.6
370.mgrid331	192	**168**	**26.3**	168	26.3	168	26.3	96	**161**	**27.4**	161	27.4	161	27.5
371.applu331	192	201	30.1	**167**	**36.3**	143	42.4	192	**186**	**32.5**	194	31.3	179	33.8
372.smithwa	192	**97.4**	**55.0**	97.9	54.7	97.3	55.1	192	**97.7**	**54.9**	97.4	55.1	97.9	54.7
376.kdtree	192	213	21.1	213	21.1	**213**	**21.1**	192	**207**	**21.7**	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/aknyaze1/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/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)  : 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: -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 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.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 questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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