SPEC® OMPG2012 Result

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Intel

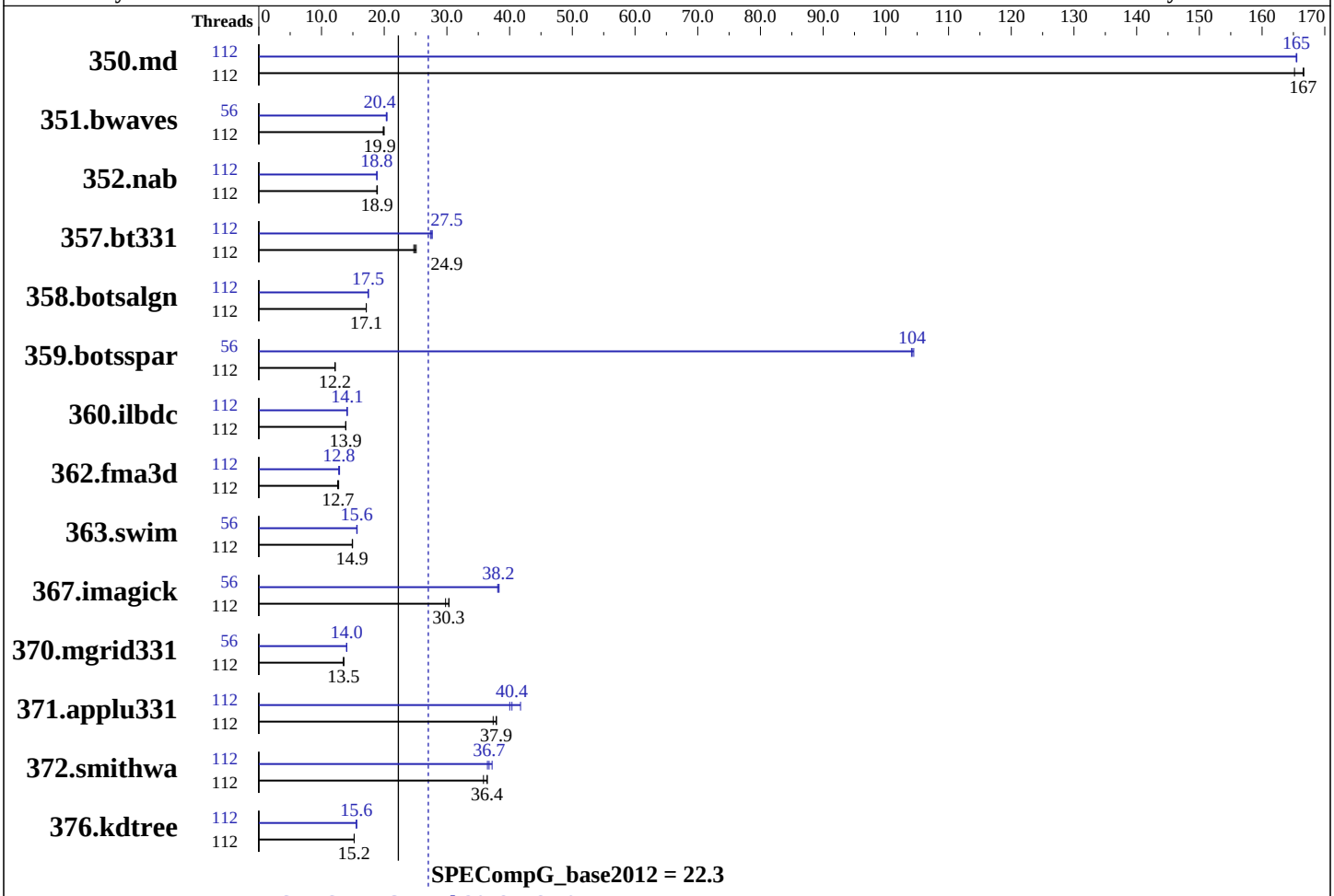
Intel Server System R2208WFTZS (2 x Intel Xeon Platinum 8280L, DDR4-2933, Turbo OFF, SMT ON)

SPECompG_peak2012 = 27.0

SPECompG_base2012 = 22.3

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

Test date: Mar-2019
Hardware Availability: Apr-2019
Software Availability: Jan-2019



Hardware

CPU Name:	Intel Xeon Platinum 8280L
CPU Characteristics:	Turbo OFF, SMT ON
CPU MHz:	2700
CPU MHz Maximum:	2700
FPU:	Integrated
CPU(s) enabled:	56 cores, 2 chips, 28 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:	38.5 MB I+D on chip per chip
Other Cache:	None
Memory:	192 GB (12 x 16 GB 2Rx8 DDR4-2933Y-R)
Disk Subsystem:	Panasas ActiveStor 14 (124TB connected via 10GB Ethernet)
Other Hardware:	None
Base Threads Run:	112

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Software

Operating System:	Oracle Linux Server release 7.6
Compiler:	C/C++/Fortran: Version 19.0.2.187 of Intel Composer XE for Linux
Auto Parallel:	No
File System:	PanFS
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: 56
Maximum Peak Threads: 112

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	112	27.8	167	28.0	165	**27.8**	**167**	112	28.0	166	28.0	165	**28.0**	**165**
351.bwaves	112	228	19.8	**227**	**19.9**	227	20.0	56	223	20.3	**222**	**20.4**	222	20.4
352.nab	112	206	18.9	207	18.8	**206**	**18.9**	112	207	18.8	**207**	**18.8**	206	18.9
357.bt331	112	**190**	**24.9**	192	24.7	189	25.1	112	**172**	**27.5**	171	27.7	173	27.4
358.botsalgn	112	**254**	**17.1**	254	17.1	254	17.1	112	249	17.5	**249**	**17.5**	249	17.5
359.botsspar	112	432	12.1	431	12.2	**432**	**12.2**	56	**50.4**	**104**	50.4	104	50.3	104
360.ilbdc	112	256	13.9	257	13.9	**257**	**13.9**	112	**253**	**14.1**	253	14.1	252	14.1
362.fma3d	112	**300**	**12.7**	302	12.6	298	12.7	112	**297**	**12.8**	295	12.9	298	12.7
363.swim	112	303	15.0	304	14.9	**304**	**14.9**	56	290	15.6	**289**	**15.6**	289	15.7
367.imagick	112	232	30.3	**232**	**30.3**	236	29.8	56	185	38.1	183	38.3	**184**	**38.2**
370.mgrid331	112	**326**	**13.5**	326	13.6	328	13.5	56	315	14.0	**315**	**14.0**	315	14.0
371.applu331	112	160	37.9	162	37.4	**160**	**37.9**	112	**150**	**40.4**	145	41.7	151	40.0
372.smithwa	112	150	35.8	**147**	**36.4**	147	36.4	112	144	37.2	147	36.5	**146**	**36.7**
376.kdtree	112	**296**	**15.2**	296	15.2	296	15.2	112	290	15.5	**289**	**15.6**	289	15.6

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 elc02 Tue Mar 26 13:57:24 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 8280L CPU @ 2.70GHz
      2 "physical id"s (chips)
      112 "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 : 28
      siblings  : 56
      physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
   cache size : 39424 KB
```

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Platform Notes (Continued)

```
From /proc/meminfo
   MemTotal:       196689540 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   oracle-release: Oracle Linux Server release 7.6
   os-release:
      NAME="Oracle Linux Server"
      VERSION="7.6"
      ID="ol"
      VARIANT="Server"
      VARIANT_ID="server"
      VERSION_ID="7.6"
      PRETTY_NAME="Oracle Linux Server 7.6"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
   system-release: Oracle Linux Server release 7.6
   system-release-cpe: cpe:/o:oracle:linux:7:6:server

uname -a:
   Linux elc02 3.10.0-957.5.1.el7.crt1.x86_64 #1 SMP Fri Feb 1 14:04:43 MST 2019
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 25 16:12

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  200T   70T  75% /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,verbose

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

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

Continued on next page

General Notes (Continued)

```
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,verbose

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

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

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

==============================================================================
370.mgrid331:peak:
  ENV_KMP_AFFINITY=compact,1,verbose
```

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Continued on next page

Base Compiler Invocation (Continued)

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:
ifort

Peak Portability Flags

350.md: -FR
357.bt331: -mcmodel=medium
363.swim: -mcmodel=medium

Continued on next page

Peak Portability Flags (Continued)

367.imagick: `-std=c99`

Peak Optimization Flags

C benchmarks:

352.nab: `-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-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 -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 -fno-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`

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`

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Peak Optimization Flags (Continued)

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: `-O3 -qopenmp -xCORE-AVX2 -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=0 -align all`

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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