SPEC® OMPG2012 Result

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Intel

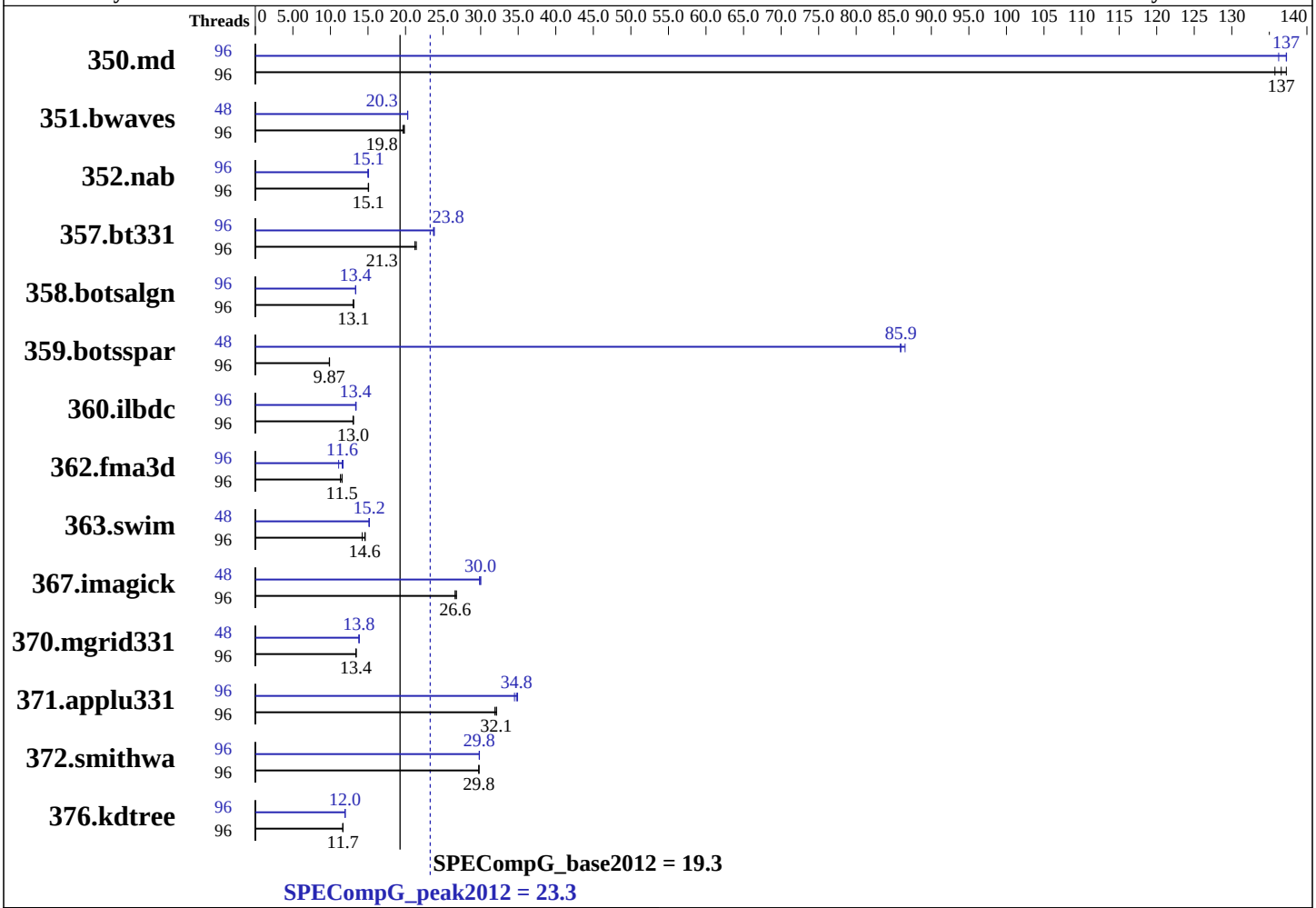
Intel Server System R2208WFTZS (2 x Intel Xeon Platinum 8260L, DDR4-2933, Turbo OFF, SMT ON)

SPECompG_peak2012 = 23.3

SPECompG_base2012 = 19.3

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 8260L
CPU Characteristics:	Turbo OFF, SMT ON
CPU MHz:	2400
CPU MHz Maximum:	2400
FPU:	Integrated
CPU(s) enabled:	48 cores, 2 chips, 24 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:	35.75 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:	96

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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: 48
Maximum Peak Threads: 96

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	96	34.1	136	**33.9**	**137**	33.7	137	96	**33.7**	**137**	34.0	136	33.7	137
351.bwaves	96	228	19.8	231	19.6	**229**	**19.8**	48	224	20.3	223	20.3	**223**	**20.3**
352.nab	96	258	15.1	**258**	**15.1**	259	15.0	96	258	15.1	260	15.0	**258**	**15.1**
357.bt331	96	**223**	**21.3**	223	21.3	221	21.4	96	**199**	**23.8**	199	23.8	200	23.7
358.botsalgn	96	332	13.1	334	13.0	**332**	**13.1**	96	326	13.4	**326**	**13.4**	326	13.4
359.botsspar	96	**532**	**9.87**	533	9.85	531	9.88	48	**61.1**	**85.9**	61.1	85.9	60.7	86.5
360.ilbdc	96	274	13.0	272	13.1	**273**	**13.0**	96	**266**	**13.4**	265	13.4	266	13.4
362.fma3d	96	**329**	**11.5**	336	11.3	329	11.5	96	343	11.1	**328**	**11.6**	325	11.7
363.swim	96	318	14.2	**311**	**14.6**	309	14.6	48	300	15.1	**298**	**15.2**	298	15.2
367.imagick	96	**264**	**26.6**	262	26.8	264	26.6	48	236	29.8	234	30.0	**235**	**30.0**
370.mgrid331	96	330	13.4	329	13.4	**330**	**13.4**	48	**320**	**13.8**	320	13.8	320	13.8
371.applu331	96	**189**	**32.1**	190	31.9	189	32.1	96	176	34.5	**174**	**34.8**	174	34.9
372.smithwa	96	180	29.8	180	29.8	**180**	**29.8**	96	**180**	**29.8**	180	29.8	180	29.8
376.kdtree	96	386	11.7	386	11.7	**386**	**11.7**	96	377	11.9	376	12.0	**376**	**12.0**

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 epb137 Sat Mar 16 01:21:23 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 8260L CPU @ 2.40GHz
      2 "physical id"s (chips)
      96 "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 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27
      28 29
      physical 1: 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
```

Continued on next page

Platform Notes (Continued)

```
From /proc/meminfo
   MemTotal:       196678404 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 epb137 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 11 13:26

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  199T   71T  74% /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

------------------------------------------------------------------------
```

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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

   Submitted_by: "Knyazev, Alexander" <Alexander.Knyazev@intel.com>
   Submitted: Tue Mar 26 09:42:41 EDT 2019
   Submission: omp2012-20190326-00175.sub
    ================================================================================
    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

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

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

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Peak Optimization Flags (Continued)

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: `-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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