SPEC® OMPG2012 Result

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Huawei

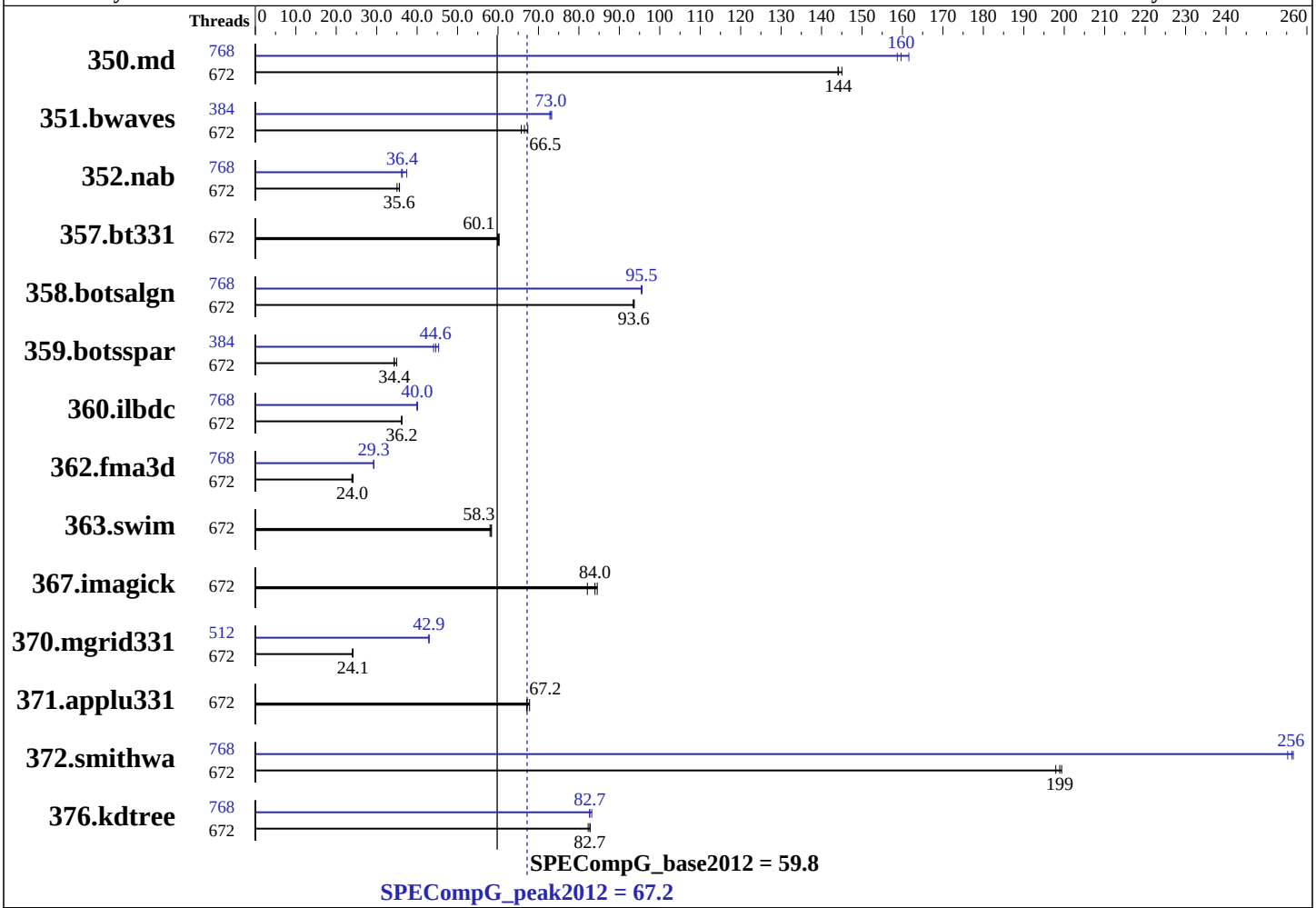
KunLun 9016
(384 core, 2.20 GHz, Intel Xeon E7-8890 v4)

SPECompG_peak2012 = 67.2

SPECompG_base2012 = 59.8

OMP2012 license: 27
Test sponsor: Huawei
Tested by: Huawei

Test date: May-2017
Hardware Availability: Jun-2016
Software Availability: Feb-2017



Hardware

CPU Name:	Intel Xeon E7-8890 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.40 GHz
CPU MHz:	2200
CPU MHz Maximum:	3400
FPU:	Integrated
CPU(s) enabled:	384 cores, 16 chips, 24 cores/chip, 2 threads/core
CPU(s) orderable:	4,8,16 Chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	60 MB I+D on chip per chip
Other Cache:	None
Memory:	2 TB (128 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem:	2 x 600 GB SAS, 10 K RPM
Other Hardware:	None
Base Threads Run:	672

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Software

Operating System:	SUSE Linux Enterprise Server 12 (x86_64) SP2 Kernel 4.4.21-69-default
Compiler:	C/C++/Fortran: Version 17.0.2.174 of Intel Parallel Studio XE 2017 for Linux;
Auto Parallel:	No
File System:	btrfs
System State:	run level 5
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other Software:	None

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Minimum Peak Threads: 384
Maximum Peak Threads: 768

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	672	32.1	144	**32.1**	**144**	31.9	145	768	29.2	159	28.7	162	**29.0**	**160**
351.bwaves	672	68.9	65.8	**68.1**	**66.5**	67.2	67.4	384	**62.0**	**73.0**	61.8	73.3	62.2	72.8
352.nab	672	109	35.6	**109**	**35.6**	111	35.0	768	104	37.4	108	36.1	**107**	**36.4**
357.bt331	672	78.6	60.3	**78.8**	**60.1**	79.1	60.0	672	78.6	60.3	**78.8**	**60.1**	79.1	60.0
358.botsalgn	672	46.4	93.7	**46.5**	**93.6**	46.6	93.4	768	45.5	95.6	**45.5**	**95.5**	45.6	95.4
359.botsspar	672	153	34.3	150	35.0	**153**	**34.4**	384	116	45.3	**118**	**44.6**	119	44.1
360.ilbdc	672	98.4	36.2	**98.3**	**36.2**	98.3	36.2	768	88.7	40.1	89.1	40.0	**89.0**	**40.0**
362.fma3d	672	159	23.9	**159**	**24.0**	157	24.2	768	**130**	**29.3**	130	29.2	130	29.3
363.swim	672	**77.7**	**58.3**	77.6	58.4	78.1	58.0	672	**77.7**	**58.3**	77.6	58.4	78.1	58.0
367.imagick	672	85.6	82.1	**83.7**	**84.0**	83.2	84.5	672	85.6	82.1	**83.7**	**84.0**	83.2	84.5
370.mgrid331	672	**183**	**24.1**	183	24.1	184	24.0	512	**103**	**42.9**	103	42.9	103	42.9
371.applu331	672	89.4	67.8	**90.1**	**67.2**	90.3	67.1	672	89.4	67.8	**90.1**	**67.2**	90.3	67.1
372.smithwa	672	27.1	198	26.9	199	**26.9**	**199**	768	20.9	257	**20.9**	**256**	21.0	255
376.kdtree	672	54.7	82.3	**54.4**	**82.7**	54.4	82.8	768	54.1	83.2	**54.4**	**82.7**	54.5	82.6

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Platform Notes

```
Sysinfo program /omp2012/Docs/sysinfo
$Rev: 395 $ $Date:: 2012-07-25 #$ 8f8c0fe9e19c658963a1e67685e50647
running on linux-ailn Fri May 19 17:03:24 2017

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) CPU E7-8890 v4 @ 2.20GHz
      16 "physical id"s (chips)
      768 "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 8 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 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
      27 28 29
      physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
```

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Platform Notes (Continued)

```
        27 28 29
        physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 4: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 5: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 6: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 7: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 8: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 9: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 10: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 11: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 12: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 13: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 14: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 15: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
     cache size : 61440 KB

  From /proc/meminfo
     MemTotal:       2112824644 kB
     HugePages_Total:   65536
     Hugepagesize:       2048 kB

  /usr/bin/lsb_release -d
     SUSE Linux Enterprise Server 12 SP2

  From /etc/*release* /etc/*version*
     SuSE-release:
        SUSE Linux Enterprise Server 12 (x86_64)
        VERSION = 12
        PATCHLEVEL = 2
        # This file is deprecated and will be removed in a future service pack or
        release.
        # Please check /etc/os-release for details about this release.
     os-release:
        NAME="SLES"
        VERSION="12-SP2"
        VERSION_ID="12.2"
        PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
        ID="sles"
        ANSI_COLOR="0;32"
```

Continued on next page

Platform Notes (Continued)

```
      CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
   Linux linux-ailn 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
   (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 5 May 18 01:49

SPEC is set to: /omp2012
   Filesystem     Type   Size  Used Avail Use% Mounted on
   /dev/sda3      btrfs  1.1T  364G  729G  34% /

Additional information from dmidecode:
  BIOS American Megatrends Inc. BLXSV207 04/17/2017
  Memory:
   128x Hynix HMA82GR7AFR8N-UH 16 GB 1600 MHz 2 rank
   256x NO DIMM NO DIMM

(End of data from sysinfo program)
```

General Notes

```
 ------------------------------------------------------------------------
Power profile set with:
cpupower -c all frequency-set -g performance

System settings notes:
Intel Turbo Boost Technology (Turbo)  : Enabled
Memory RAS Configuration set to Maximum Performance

 ------------------------------------------------------------------------
General Notes and Enviroment variables
  ENV_KMP_AFFINITY=compact,1
  ENV_KMP_BLOCKTIME=infinite
  ENV_KMP_DETERMINISTIC_REDUCTION=1
  ENV_OMP_DYNAMIC=FALSE
  ENV_KMP_LIBRARY=turnaround
  ENV_KMP_SCHEDULE=static,balanced
  ENV_KMP_STACKSIZE=512M
  ENV_OMP_NESTED=FALSE
  ENV_OMP_NUM_THREADS=672

 ------------------------------------------------------------------------
General base OMP Library Settings
  ENV_KMP_AFFINITY=compact,1

 ------------------------------------------------------------------------
General peak OMP Library Settings
  ENV_KMP_AFFINITY=compact,1

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

Continued on next page

General Notes (Continued)

```
Per benchmark peak OMP Library Settings

================================================================================
351.bwaves:peak:
  ENV_KMP_AFFINITY=compact,1
  ENV_OMP_SCHEDULE=static,1

================================================================================
359.botsspar:peak:
  ENV_KMP_AFFINITY=compact,1
  ENV_OMP_SCHEDULE=guided

================================================================================
362.fma3d:peak:
  ENV_OMP_SCHEDULE=static,1
================================================================================
363.swim:peak:
  ENV_KMP_AFFINITY=compact,1

================================================================================
372.smithwa:peak:
  ENV_KMP_AFFINITY=compact,1
```

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 -openmp -ipo -xCORE-AVX2 -ansi-alias -shared-intel

Continued on next page

Base Optimization Flags (Continued)

C++ benchmarks:
```
-O3 -openmp -ipo  -xCORE-AVX2 -ansi-alias -shared-intel
```

Fortran benchmarks:
```
-O3 -openmp -ipo  -xCORE-AVX2 -align array64byte
```

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 -openmp -ipo  -xCORE-AVX2 -fno-alias -opt-malloc-options=1 -opt-calloc -fp-model fast=2 -no-prec-div -no-prec-sqrt -ansi-alias`

358.botsalgn: `-O3 -openmp -ipo  -xCORE-AVX2 -fno-alias -ansi-alias`

359.botsspar: `Same as 358.botsalgn`

367.imagick: `basepeak = yes`

372.smithwa: `-O3 -openmp -ipo  -xCORE-AVX2 -fno-alias -opt-streaming-stores always -opt-malloc-options=1 -ansi-alias`

C++ benchmarks:
```
-O3 -openmp -ipo  -xCORE-AVX2 -ansi-alias
```

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Peak Optimization Flags (Continued)

Fortran benchmarks:

350.md: `-O3 -openmp -ipo -xCORE-AVX2 -fno-alias -opt-malloc-options=1 -fp-model fast=2 -no-prec-div -no-prec-sqrt -align array64byte`

351.bwaves: `-O3 -openmp -ipo -xCORE-AVX2 -fno-alias -fp-model fast=2 -no-prec-div -no-prec-sqrt -align array64byte`

357.bt331: `basepeak = yes`

360.ilbdc: `-O3 -openmp -ipo -xCORE-AVX2 -fno-alias -align array64byte`

362.fma3d: `Same as 360.ilbdc`

363.swim: `basepeak = yes`

370.mgrid331: `-O3 -openmp -ipo -xCORE-AVX2 -fno-alias -opt-malloc-options=3 -fp-model strict`

371.applu331: `basepeak = yes`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/omp2012/flags/Intel-ic13.0-linux64.20140219.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/omp2012/flags/Intel-ic13.0-linux64.20140219.xml`

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

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