SPEC® OMPG2012 Result
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Huawei

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

$SPECompG\_peak2012 = 67.2$
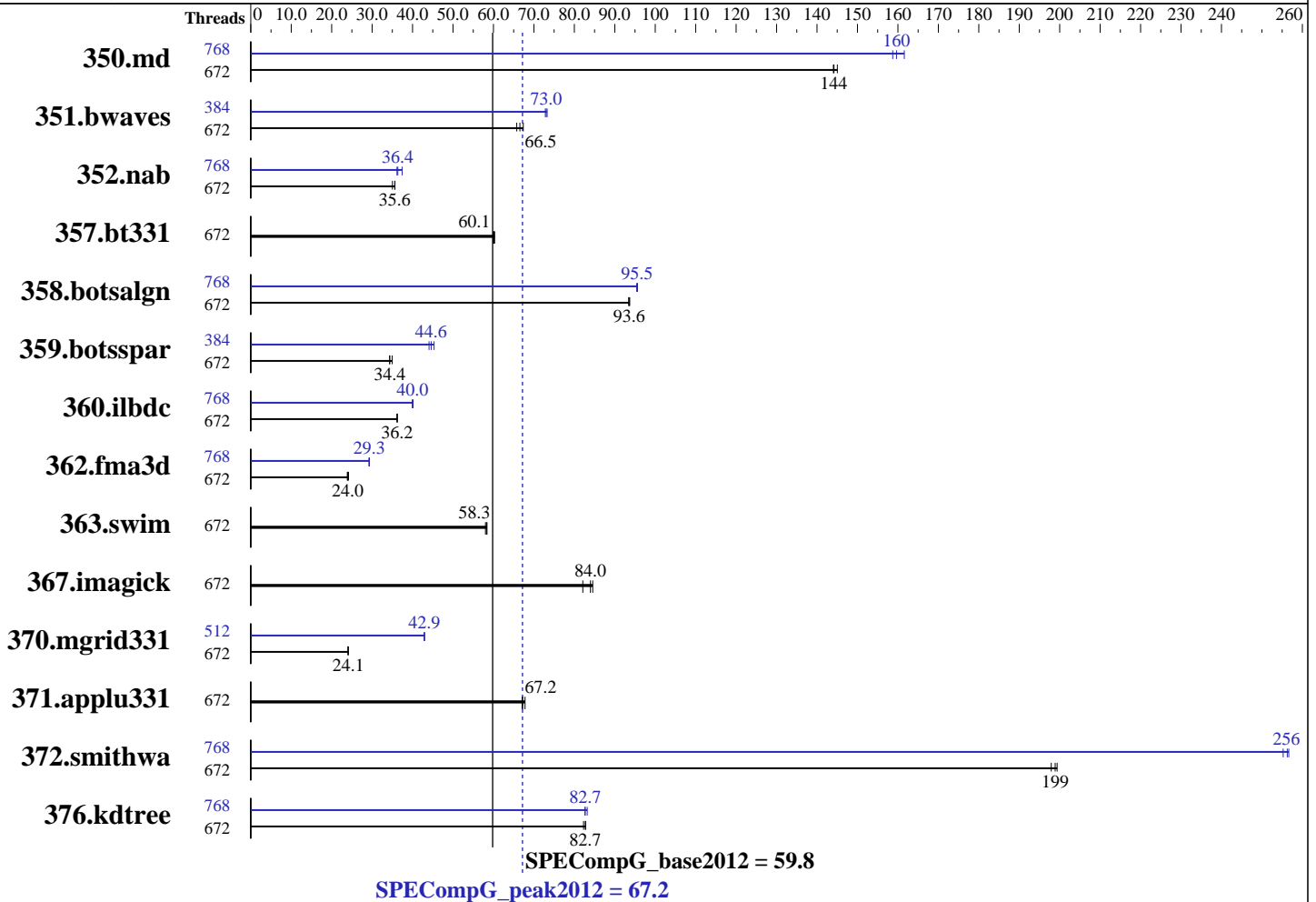
$SPECompG\_base2012 = 59.8$

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

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

Benchmark	Threads	Score
350.md	768	160
	672	144
351.bwaves	384	73.0
	672	66.5
352.nab	768	36.4
	672	35.6
357.bt331	672	60.1
358.botsalgn	768	95.5
	672	93.6
359.botsspar	384	44.6
	672	34.4
360.ilbdc	768	40.0
	672	36.2
362.fma3d	768	29.3
	672	24.0
363.swim	672	58.3
367.imagick	672	84.0
370.mgrid331	512	42.9
	672	24.1
371.applu331	672	67.2
372.smithwa	768	256
	672	199
376.kdtree	768	82.7
	672	82.7

SPECompG_base2012 = 59.8
SPECompG_peak2012 = 67.2

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

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

Continued on next page

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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
```

Continued on next page

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OMP2012 license: 27
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Test date: May-2017
Hardware Availability: Jun-2016
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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

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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

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

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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

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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

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC OMP2012 v1.0.
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