SPEC® OMPG2012 Result

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Huawei

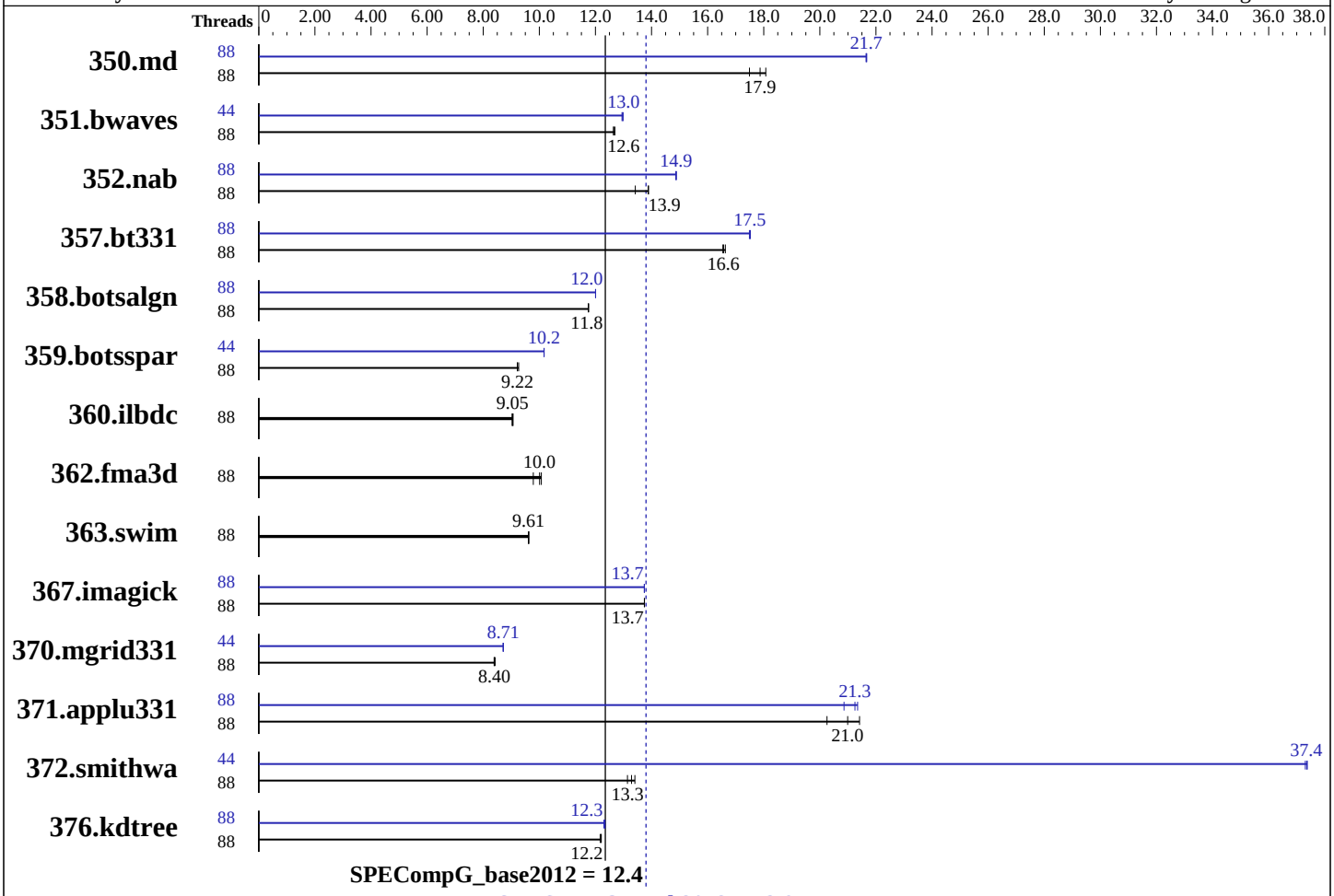
Huawei RH2288H V3 (Intel Xeon E5-2699 v4)

SPECompG_peak2012 = 13.8

SPECompG_base2012 = 12.4

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

Test date: Nov-2016
Hardware Availability: Apr-2016
Software Availability: Aug-2016



Hardware

CPU Name:	Intel Xeon E5-2699 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz:	2200
CPU MHz Maximum:	3600
FPU:	Integrated
CPU(s) enabled:	44 cores, 2 chips, 22 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:	256 KB I+D on chip per cores
L3 Cache:	55 MB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem:	1 X 1 TB SATA, 7200 RPM
Other Hardware:	None
Base Threads Run:	88
Minimum Peak Threads:	44

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Software

Operating System:	Red Hat Enterprise Linux Server release 7.2 Kernel 3.10.0-327.el7.x86_64
Compiler:	C/C++/Fortran: Version 16.0.3.210 of Intel Composer XE for Linux Build 20160415
Auto Parallel:	No
File System:	Linux ext4
System State:	Default
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other Software:	None

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Maximum Peak Threads: 88

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	88	256	18.1	**259**	**17.9**	265	17.5	88	214	21.7	214	21.6	**214**	**21.7**
351.bwaves	88	358	12.6	357	12.7	**358**	**12.6**	44	**349**	**13.0**	350	12.9	349	13.0
352.nab	88	290	13.4	**280**	**13.9**	280	13.9	88	261	14.9	**261**	**14.9**	262	14.9
357.bt331	88	285	16.6	287	16.5	**286**	**16.6**	88	271	17.5	**271**	**17.5**	271	17.5
358.botsalgn	88	370	11.7	**370**	**11.8**	370	11.8	88	362	12.0	362	12.0	**362**	**12.0**
359.botsspar	88	567	9.26	570	9.22	**569**	**9.22**	44	**516**	**10.2**	516	10.2	516	10.2
360.ilbdc	88	393	9.06	**393**	**9.05**	394	9.03	88	393	9.06	**393**	**9.05**	394	9.03
362.fma3d	88	377	10.1	**380**	**10.0**	388	9.78	88	377	10.1	**380**	**10.0**	388	9.78
363.swim	88	**471**	**9.61**	471	9.63	471	9.61	88	**471**	**9.61**	471	9.63	471	9.61
367.imagick	88	511	13.7	511	13.7	**511**	**13.7**	88	511	13.7	**512**	**13.7**	512	13.7
370.mgrid331	88	525	8.42	527	8.39	**526**	**8.40**	44	507	8.72	**507**	**8.71**	508	8.71
371.applu331	88	283	21.4	299	20.3	**289**	**21.0**	88	284	21.3	290	20.9	**285**	**21.3**
372.smithwa	88	408	13.1	400	13.4	**403**	**13.3**	44	143	37.4	144	37.3	**143**	**37.4**
376.kdtree	88	**369**	**12.2**	370	12.2	369	12.2	88	366	12.3	**365**	**12.3**	365	12.3

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 localhost.localdomain Fri Nov 11 15:42:21 2016

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 E5-2699 v4 @ 2.20GHz
      2 "physical id"s (chips)
      88 "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 : 22
      siblings  : 44
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
   cache size : 28160 KB
```

Continued on next page

Platform Notes (Continued)

```
From /proc/meminfo
   MemTotal:       527785168 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.2 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.2"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server

uname -a:
   Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29
   EDT 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 10 17:33

SPEC is set to: /omp2012
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      xfs   254G   82G  172G  33% /

Additional information from dmidecode:
  BIOS Insyde Corp. 3.32 09/14/2016
  Memory:
   16x Micron 36ASF4G72PZ-2G3A1 32 GB 2400 MHz 2 rank
   8x NO DIMM NO DIMM

(End of data from sysinfo program)
```

General Notes

```
------------------------------------------------------------------------
  Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
  BIOS settings notes:
  Power Policy set to Performance
  Set Patrol Scrub to Disable
  QPI Snoop Mode set to Cluster on Die
  General OMP Library Settings
  ENV_KMP_LIBRARY=turnaround
  ENV_OMP_SCHEDULE=static
  ENV_KMP_STACKSIZE=256M
  ENV_OMP_DYNAMIC=FALSE
```

Continued on next page

General Notes (Continued)

```
    ENV_OMP_NESTED=FALSE
    ENV_KMP_AFFINITY=compact,0
------------------------------------------------------------------------------
Per benchmark peak OMP Library Settings

------------------------------------------------------------------------------
351.bwaves:peak:
    ENV_KMP_AFFINITY=compact,1
    ENV_OMP_SCHEDULE=static,1
------------------------------------------------------------------------------
357.bt331:peak
    ENV_OMP_SCHEDULE=static,1
------------------------------------------------------------------------------
359.botsspar:peak:
    ENV_KMP_AFFINITY=compact,1
    ENV_OMP_SCHEDULE=guided

------------------------------------------------------------------------------
370.mgrid331:peak
    ENV_KMP_AFFINITY=compact,1

------------------------------------------------------------------------------
372.smithwa:peak:
    ENV_KMP_AFFINITY=compact,1
    ENV_OMP_SCHEDULE=static,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:
```
-O2 -openmp -ipo  -xCORE-AVX2 -ansi-alias
```

C++ benchmarks:
```
-O2 -openmp -ipo  -xCORE-AVX2 -ansi-alias
```

Fortran benchmarks:
```
-O2 -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: `-O2 -openmp -ipo  -xCORE-AVX2 -ansi-alias`

372.smithwa: `-O2 -openmp -ipo  -xCORE-AVX2 -fno-alias -opt-streaming-stores always -opt-malloc-options=1 -ansi-alias`

Continued on next page

Peak Optimization Flags (Continued)

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

Fortran benchmarks:

350.md: -O2 -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: Same as 351.bwaves

360.ilbdc: basepeak = yes

362.fma3d: basepeak = yes

363.swim: basepeak = yes

370.mgrid331: -O2 -openmp -ipo -xCORE-AVX2 -fno-alias
-opt-malloc-options=3 -align array64byte

371.applu331: -O2 -openmp -ipo -xCORE-AVX2 -align array64byte

The flags file that was used to format this result can be browsed at
http://www.spec.org/omp2012/flags/Intel-ic13.0-linux64.20161208.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/omp2012/flags/Intel-ic13.0-linux64.20161208.xml

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

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