# SPEC® OMPG2012 Result

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## Huawei

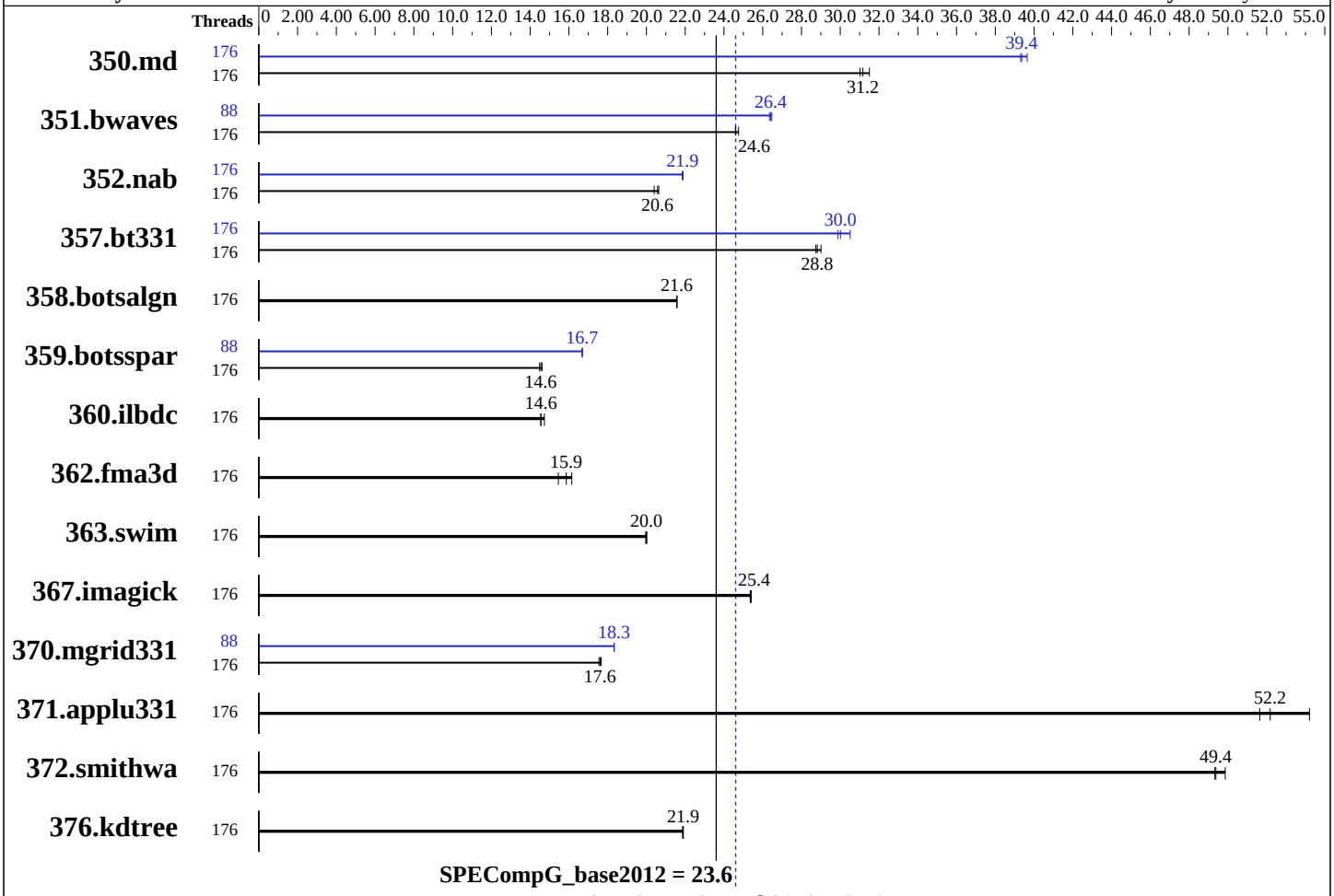
## Huawei RH5885H V3 (Intel Xeon E7-8880 v4)

**SPECompG_peak2012 = 24.6**

**SPECompG_base2012 = 23.6**

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

**Test date:** Feb-2017
**Hardware Availability:** May-2015
**Software Availability:** May-2016




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-8880 v4 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.30 GHz |
| CPU MHz: | 2200 |
| CPU MHz Maximum: | 3300 |
| FPU: | Integrated |
| CPU(s) enabled: | 88 cores, 4 chips, 22 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2, 4 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: | 55 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 512 GB (32 x 16 GB 2Rx8 PC4-2400T-R, running at 1600 MHz) |
| Disk Subsystem: | 2 x 600 GB SAS, 10K RPM |
| Other Hardware: | None |
| Base Threads Run: | 176 |

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### Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 7.2 (Maipo)<br>3.10.0-327.el7.x86_64 |
| Compiler: | C/C++: Version 16.0.2.181 of Intel C++ Studio XE for Linux;<br>Fortran: Version 16.0.2.181 of Intel Fortran |
| Auto Parallel: | No |
| File System: | xfs |
| System State: | Run level 3 |
| Base Pointers: | 64-bit |
| Peak Pointers: | 64-bit |
| Other Software: | None |

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Minimum Peak Threads: 88
Maximum Peak Threads: 176

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 350.md | 176 | 147 | 31.5 | **149** | **31.2** | 149 | 31.0 | 176 | **118** | **39.4** | 117 | 39.6 | 118 | 39.3 |
| 351.bwaves | 176 | 184 | 24.6 | **184** | **24.6** | 183 | 24.8 | 88 | 172 | 26.3 | **171** | **26.4** | 171 | 26.5 |
| 352.nab | 176 | **189** | **20.6** | 191 | 20.4 | 188 | 20.6 | 176 | 178 | 21.9 | 178 | 21.8 | **178** | **21.9** |
| 357.bt331 | 176 | **164** | **28.8** | 165 | 28.7 | 163 | 29.0 | 176 | 155 | 30.5 | 159 | 29.9 | **158** | **30.0** |
| 358.botsalgn | 176 | **202** | **21.6** | 202 | 21.6 | 202 | 21.6 | 176 | **202** | **21.6** | 202 | 21.6 | 202 | 21.6 |
| 359.botsspar | 176 | 359 | 14.6 | **361** | **14.6** | 362 | 14.5 | 88 | 314 | 16.7 | **315** | **16.7** | 315 | 16.7 |
| 360.ilbdc | 176 | 245 | 14.5 | 242 | 14.7 | **245** | **14.6** | 176 | 245 | 14.5 | 242 | 14.7 | **245** | **14.6** |
| 362.fma3d | 176 | 235 | 16.2 | **240** | **15.9** | 246 | 15.5 | 176 | 235 | 16.2 | **240** | **15.9** | 246 | 15.5 |
| 363.swim | 176 | 226 | 20.0 | **226** | **20.0** | 227 | 20.0 | 176 | 226 | 20.0 | **226** | **20.0** | 227 | 20.0 |
| 367.imagick | 176 | 277 | 25.4 | 277 | 25.4 | **277** | **25.4** | 176 | 277 | 25.4 | 277 | 25.4 | **277** | **25.4** |
| 370.mgrid331 | 176 | 250 | 17.7 | **251** | **17.6** | 252 | 17.5 | 88 | 241 | 18.3 | **241** | **18.3** | 241 | 18.3 |
| 371.applu331 | 176 | **116** | **52.2** | 117 | 51.6 | 112 | 54.2 | 176 | **116** | **52.2** | 117 | 51.6 | 112 | 54.2 |
| 372.smithwa | 176 | 107 | 49.9 | **109** | **49.4** | 109 | 49.3 | 176 | 107 | 49.9 | **109** | **49.4** | 109 | 49.3 |
| 376.kdtree | 176 | **206** | **21.9** | 206 | 21.9 | 205 | 21.9 | 176 | **206** | **21.9** | 206 | 21.9 | 205 | 21.9 |

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

## Platform Notes

```
Sysinfo program /specomp/Docs/sysinfo
$Rev: 395 $ $Date:: 2012-07-25 #$ 8f8c0fe9e19c658963a1e67685e50647
running on localhost.localdomain Thu Feb 23 01:41:04 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 E7-8880 v4 @ 2.20GHz
      4 "physical id"s (chips)
      176 "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
      physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
```

Continued on next page

## Platform Notes (Continued)

```
        28
        physical 3: 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 : 56320 KB

  From /proc/meminfo
     MemTotal:       528061232 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 Feb 23 01:21

  SPEC is set to: /specomp
     Filesystem           Type  Size  Used Avail Use% Mounted on
     /dev/mapper/rhel-root xfs    50G   27G   24G  53% /

  Additional information from dmidecode:
    BIOS American Megatrends Inc. BLISV789 12/06/2016
    Memory:
     32x   16 GB
     32x Hynix HMA42GR7MFR4N-TF 16 GB 1600 MHz 2 rank
     64x 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
```

Continued on next page

## General Notes (Continued)

```
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=256M
  ENV_OMP_NESTED=FALSE
  ENV_OMP_NUM_THREADS=176

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

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

================================================================================
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

================================================================================
357.bt331:peak:
  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`

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## Peak Optimization Flags (Continued)

358.botsalgn: `basepeak = yes`

359.botsspar: `-O3 -openmp -ipo -xCORE-AVX2 -fno-alias -ansi-alias`

367.imagick: `basepeak = yes`

372.smithwa: `basepeak = yes`

C++ benchmarks:

376.kdtree: `basepeak = yes`

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: `Same as 351.bwaves`

360.ilbdc: `basepeak = yes`

362.fma3d: `basepeak = yes`

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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