# SPEC® OMPG2012 Result

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## Hewlett Packard Enterprise

(Test Sponsor: Indiana University)

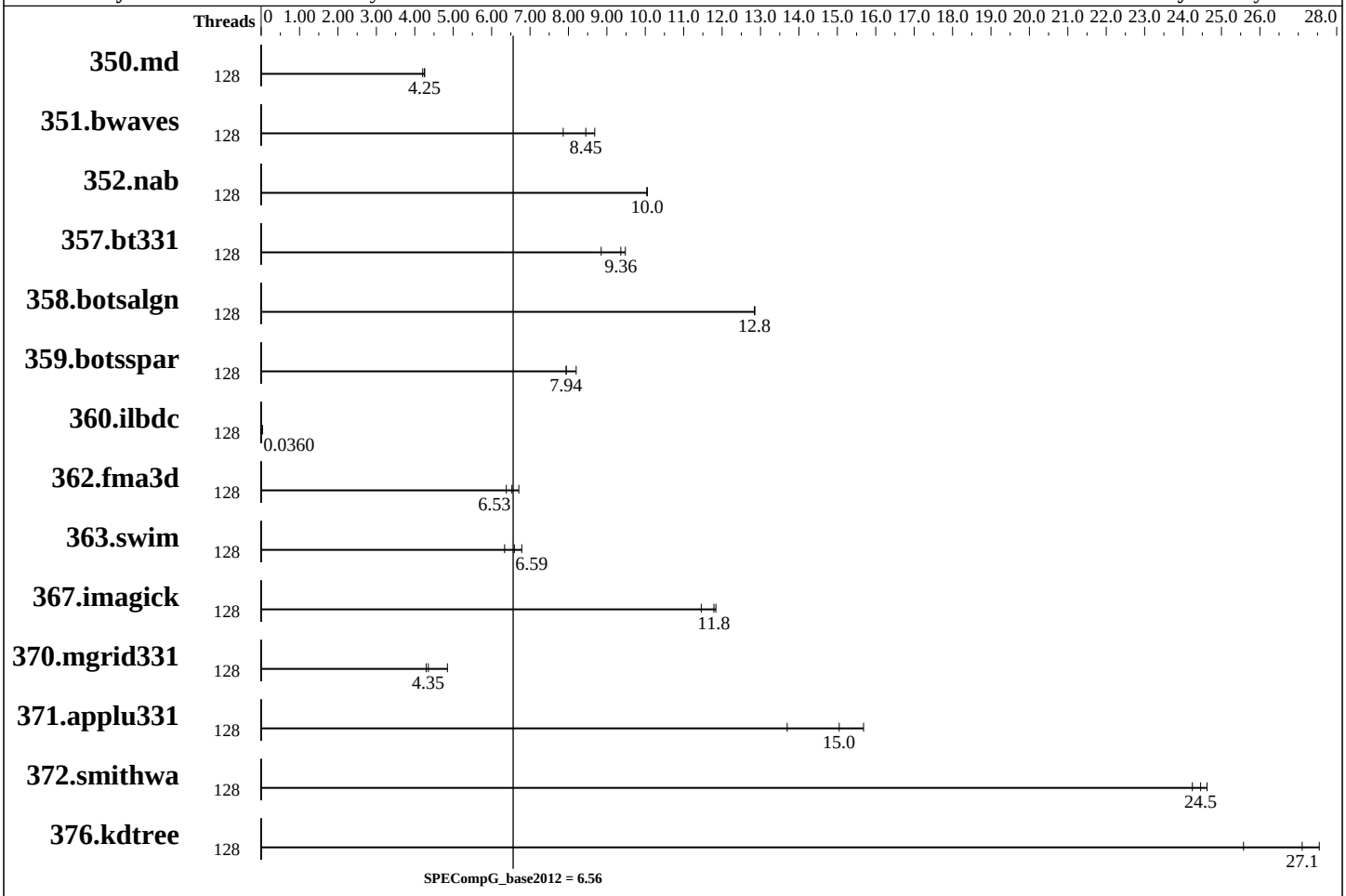
Apollo 70
(Marvell ThunderX2 CN9980 v2.1, 2.20GHz)

SPECompG_peak2012 = Not Run

SPECompG_base2012 = 6.56

**OMP2012 license:** 3440A
**Test sponsor:** Indiana University
**Tested by:** Indiana University

**Test date:** Aug-2019
**Hardware Availability:** Jun-2019
**Software Availability:** May-2019




## Hardware

| | |
|---|---|
| CPU Name: | Cavium ThunderX2 CN9980 v2.1 |
| CPU Characteristics: | 4-way SMT on, Turbo on |
| CPU MHz: | 2200 |
| CPU MHz Maximum: | 2500 |
| FPU: | Integrated |
| CPU(s) enabled: | 64 cores, 2 chips, 32 cores/chip, 4 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 core |
| L3 Cache: | 32 MB I+D on chip per core |
| Other Cache: | None |
| Memory: | 128 GB (8 x 16 GB 2Rx8 PC4-2666V-RE2-12 ) |
| Disk Subsystem: | 1x(HPE VK000960GWSRT 960GB) SSD |
| Other Hardware: | None |
| Base Threads Run: | 128 |
| Minimum Peak Threads: | -- |

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## Software

| | |
|---|---|
| Operating System: | CentOS Linux release 7.6.1810 (AltArch) 4.14.0-115.8.1.el7a.aarch64 |
| Compiler: | C/C++/Fortran: Version 9.1.0 of gcc |
| Auto Parallel: | No |
| File System: | XFS |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | Not Applicable |
| Other Software: | None |

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Maximum Peak Threads: --

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 350.md | 128 | **1089** | **4.25** | 1101 | 4.21 | 1088 | 4.26 | | | | | | | |
| 351.bwaves | 128 | 576 | 7.86 | **536** | **8.45** | 522 | 8.69 | | | | | | | |
| 352.nab | 128 | 387 | 10.0 | **387** | **10.0** | 387 | 10.1 | | | | | | | |
| 357.bt331 | 128 | 535 | 8.85 | 500 | 9.48 | **506** | **9.36** | | | | | | | |
| 358.botsalgn | 128 | 339 | 12.8 | **339** | **12.8** | 339 | 12.8 | | | | | | | |
| 359.botsspar | 128 | **661** | **7.94** | 661 | 7.94 | 640 | 8.20 | | | | | | | |
| 360.ilbdc | 128 | **98854** | **0.0360** | 98993 | 0.0360 | 98501 | 0.0361 | | | | | | | |
| 362.fma3d | 128 | 595 | 6.38 | 566 | 6.71 | **582** | **6.53** | | | | | | | |
| 363.swim | 128 | **687** | **6.59** | 668 | 6.79 | 715 | 6.34 | | | | | | | |
| 367.imagick | 128 | **596** | **11.8** | 614 | 11.5 | 594 | 11.8 | | | | | | | |
| 370.mgrid331 | 128 | 1029 | 4.30 | 911 | 4.85 | **1015** | **4.35** | | | | | | | |
| 371.applu331 | 128 | 386 | 15.7 | **403** | **15.0** | 443 | 13.7 | | | | | | | |
| 372.smithwa | 128 | 218 | 24.6 | 221 | 24.2 | **219** | **24.5** | | | | | | | |
| 376.kdtree | 128 | 163 | 27.5 | **166** | **27.1** | 176 | 25.6 | | | | | | | |

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

## Platform Notes

```
Sysinfo program /home/lijunj/spec/omp2012-1.1/Docs/sysinfo
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)
running on armstrong.sca.iu.edu Thu Aug  1 18:17:23 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
*
* Did not identify cpu model.  If you would
* like to write your own sysinfo program, see
* www.spec.org/omp2012/config.html#sysinfo
*
*
* 0 "physical id" tags found.  Perhaps this is an older system,
* or a virtualized system.  Not attempting to guess how to
* count chips/cores for this system.
*
      256 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
```

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## Platform Notes (Continued)

```
From /proc/meminfo
   MemTotal:       133322880 kB
   HugePages_Total:       0
   Hugepagesize:     524288 kB

From /etc/*release* /etc/*version*
   centos-release: CentOS Linux release 7.6.1810 (AltArch)
   centos-release-upstream: Derived from Red Hat Enterprise Linux 7.6 (Source)
   os-release:
      NAME="CentOS Linux"
      VERSION="7 (AltArch)"
      ID="centos"
      ID_LIKE="rhel fedora"
      VERSION_ID="7"
      PRETTY_NAME="CentOS Linux 7 (AltArch)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:centos:centos:7"
   redhat-release: CentOS Linux release 7.6.1810 (AltArch)
   system-release: CentOS Linux release 7.6.1810 (AltArch)
   system-release-cpe: cpe:/o:centos:centos:7

uname -a:
   Linux armstrong.sca.iu.edu 4.14.0-115.8.1.el7a.aarch64 #1 SMP Wed Jun 5
   15:01:21 UTC 2019 aarch64 aarch64 aarch64 GNU/Linux

run-level 3 Jul 2 15:36

SPEC is set to: /home/lijunj/spec/omp2012-1.1
   Filesystem              Type  Size  Used Avail Use% Mounted on
   /dev/mapper/centos-root xfs   256G   86G  171G  34% /
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

```
Environment Variables:
    OMP_STACKSIZE=2G
    ulimit -s unlimited

BIOS Info:
     Version: L50_5.13_1.0.6
     Release Date: 07/10/2018
```

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## General Notes (Continued)

```
BIOS Settings:
     Turbo/CPPC Mode:  Autonomous Turbo

Spectre & 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.
```

## Base Compiler Invocation

C benchmarks:
gcc

C++ benchmarks:
g++

Fortran benchmarks:
gfortran

## Base Portability Flags

350.md: -ffree-form -fno-range-check
363.swim: -mcmodel=large
367.imagick: -std=c99

## Base Optimization Flags

C benchmarks:
-O3 -ffast-math -mcpu=native -fopenmp -fsigned-char

C++ benchmarks:
-O3 -ffast-math -mcpu=native -fopenmp

Fortran benchmarks:
-O3 -ffast-math -mcpu=native -fopenmp

The flags files that were used to format this result can be browsed at
http://www.spec.org/omp2012/flags/hpe_apollo70_bios.html
http://www.spec.org/omp2012/flags/gcc-linux64.20190904.html

You can also download the XML flags sources by saving the following links:

`http://www.spec.org/omp2012/flags/hpe_apollo70_bios.xml`
`http://www.spec.org/omp2012/flags/gcc-linux64.20190904.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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