Hewlett Packard Enterprise
(Test Sponsor: Indiana University)
Apollo 70
(Marvell ThunderX2 CN9980 v2.1, 2.20GHz)
SPECompG_peak2012 = Not Run
SPECompG_base2012 = 10.0

OMP2012 license: 3440A
Test date: Jul-2019
Test sponsor: Indiana University
Hardware Availability: Jun-2019
Tested by: Indiana University
Software Availability: Jun-2019

Tested by: Indiana University

<table>
<thead>
<tr>
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<tr>
<td>256</td>
<td></td>
<td>8.90</td>
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<td>10.3</td>
<td>8.13</td>
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<td>5.89</td>
<td>13.2</td>
<td>10.9</td>
<td>15.6</td>
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</table>

SPECompG_base2012 = 10.0

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: 256
Minimum Peak Threads: --

Software
Operating System: CentOS Linux release 7.6.1810 (AltArch)
Compiler: C/C++/Fortran: Version 19.2 of ARM Compiler
Build 155 (based on LLVM 7.1.0)
Auto Parallel: No
File System: XFS
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other Software: None

Continued on next page
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Maximum Peak Threads: --

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<th>Seconds</th>
<th>Ratio</th>
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</tbody>
</table>

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 Wed Jul 17 02:50:43 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.)
SPEC OMPG2012 Result

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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 76G 181G 30% /

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

Continued on next page
**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:
- armclang

C++ benchmarks:
- armclang++

Fortran benchmarks:
- armflang

**Base Portability Flags**

- 350.md: -Mfreeform
- 357.bt331: -mcmode=large
- 363.swim: -mcmode=large

**Base Optimization Flags**

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

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

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

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/arm_compiler.html
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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/arm_compiler.xml