Hewlett Packard Enterprise
(Test Sponsor: Indiana University)
Apollo 70
(Marvell ThunderX2 CN9980 v2.1, 2.20GHz)

SPECompG_peak2012 = Not Run
SPECompG_base2012 = 5.17

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

<table>
<thead>
<tr>
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</table>

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: 1xHPE VK000960GWSRT 960GB SSD
Other Hardware: None
Base Threads Run: 64
Minimum Peak Threads: --

Software
Operating System: CentOS Linux release 7.6.1810 (AltArch)
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

<table>
<thead>
<tr>
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<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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</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 Sun Jul 28 20:45:39 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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SPEC OMPG2012 Result

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General Notes (Continued)

BIOS Settings:
Turbo/CPUC 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
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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/gcc-linux64.20190904.xml