Intel

Intel Server System M70KLP (Intel Xeon Platinum 8360Y, 2.40 GHz)

SPECompG_peak2012 = 39.0
SPECompG_base2012 = 32.4

OMP2012 license: 13
Test sponsor: Intel
Tested by: Intel

Test date: Apr-2021
Hardware Availability: Mar-2021
Software Availability: Mar-2021

| Threads | 0 | 10.0 | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 |
|---------|---|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 350.md  | 144 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 228 |
| 351.bwaves | 72  | 28.8 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 228 |
| 352.nab  | 144 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 357.bt331 | 144 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 358.botsalgn | 144 | 22.5 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 359.botsspar | 72  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 360.ilbdc | 144 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 361.fma3d | 144 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 363.swim  | 72  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 367.imagick | 72  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 370.mgrid331 | 72 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 371.applu331 | 72  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 372.smithwa | 144 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 376.kdtree | 144 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

SPECompG_base2012 = 32.4
SPECompG_peak2012 = 39.0

Hardware

CPU Name: Intel Xeon Platinum 8360Y
CPU Characteristics: Intel Turbo Boost Technology: Disabled
CPU MHz: 2400
CPU MHz Maximum: 3500
FPU: Integrated
CPU(s) enabled: 72 cores, 2 chips, 36 cores/chip, 2 threads/core
CPU(s) orderable: 1.2 Chips
Primary Cache: 32 KB I + 48 KB D on chip per core
Secondary Cache: 1.25 MB I+D on chip per core
L3 Cache: 54 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx8 DDR4-3200Y-R)
Disk Subsystem: SSDSC2KG96 960GB
Other Hardware: --
Base Threads Run: 144
Minimum Peak Threads: 72

Software

Operating System: CentOS Linux release 8.3.2011 (Core)
Compiler: C/C++/Fortran: Version 2021.2.0.2883 of Intel Composer XE for Linux
Auto Parallel: No
File System: Linux ext3
System State: Run Level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other Software: None
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Threads</th>
<th>Peak Seconds</th>
<th>Peak 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 /global/panfs02/innl/aknyaze1/OMP2012/1.1/Docs/sysinfo
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)
running on eij379 Sun Apr 18 10:12:35 2021

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) Platinum 8360Y CPU @ 2.40GHz
- 2 "physical id"s (chips)
- 144 "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 : 36
- siblings : 72
- physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
- cache size : 55296 KB

Continued on next page
SPEC OMPG2012 Result

Intel
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Software Availability: Mar-2021

Platform Notes (Continued)

From /proc/meminfo
MemTotal: 263785224 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
centos-release: CentOS Linux release 8.3.2011
centos-release-upstream: Derived from Red Hat Enterprise Linux 8.3
os-release:
NAME="CentOS Linux"
VERSION="8"
ID="centos"
ID_LIKE="rhel fedora"
VERSION_ID="8"
PLATFORM_ID="platform:el8"
PRETTY_NAME="CentOS Linux 8"
ANSI_COLOR="0;31"
redhat-release: CentOS Linux release 8.3.2011
system-release: CentOS Linux release 8.3.2011
system-release-cpe: cpe:/o:centos:centos:8

uname -a:
Linux eij379 4.18.0-240.22.1.el8_3.crt1.x86_64 #1 SMP Thu Apr 8 10:38:43 MDT 2021 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Apr 15 17:10

SPEC is set to:/global/panfs02/innl/aknyaze1/OMP2012/1.1
Filesystem Type Size Used Avail Use% Mounted on
panfs://36.101.212.1/innl panfs 269T 210T 59T 79% /global/panfs02/innl

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

========================================================================
General base OMP Library Settings
ENV_KMP_AFFINITY=compact,0,verbose
========================================================================

General peak OMP Library Settings
ENV_KMP_AFFINITY=compact,0,verbose
========================================================================

Continued on next page
SPEC OMPG2012 Result

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Software Availability: Mar-2021

General Notes (Continued)

Per benchmark peak OMP Library Settings

System settings notes:
   Intel Turbo Boost Technology (Turbo) : Disabled

General OMP Library Settings
   KMP_LIBRARY=turnaround
   KMP_STACKSIZE=292M
   KMP_BLOCKTIME=infinite
   OMP_DYNAMIC=FALSE
   OMP_NESTED=FALSE
   OMP_SCHEDULE=static

Spectre and 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.

351.bwaves:peak:
   ENV_KMP_AFFINITY=compact,1,verbose

359.botsspar:peak:
   ENV_KMP_AFFINITY=compact,1,verbose

363.swim:peak:
   ENV_KMP_AFFINITY=compact,1,verbose

367.imagick:peak:
   ENV_KMP_AFFINITY=compact,1,verbose

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

370.mgrid331:peak:
Compiler: Fortran: Version 19.0.3.199 of Intel Composer XE for Linux

Base Compiler Invocation

C benchmarks:
   icc
Intel Server System M70KLP (Intel Xeon Platinum 8360Y, 2.40 GHz)

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Software Availability: Mar-2021

Base Compiler Invocation (Continued)

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:
  -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
  -ansi-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=0 -ipo

C++ benchmarks:
  -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
  -ansi-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=0 -ipo

Fortran benchmarks:
  -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
  -ansi-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=0 -ipo
  -align all

Peak Compiler Invocation

C benchmarks (except as noted below):
  icx

  367.imagick: icc

  372.smithwa: icc

C++ benchmarks:
  icpx

Fortran benchmarks (except as noted below):
  ifort

Continued on next page
Intel
Intel Server System M70KLP (Intel Xeon Platinum 8360Y, 2.40 GHz)

SPECompG_peak2012 = 39.0
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Peak Compiler Invocation (Continued)

370.mgrid331: ifx
371.applu331: /opt/intel/compiler/2019u3/bin/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 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fno-alias -ipo
358.botsalign: Same as 352.nab
359.botsspar: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fno-alias
367.imagick: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high
   -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -ipo
372.smithwa: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high
   -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
   -ipo -qopt-prefetch=0 -ipo
   -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
   -ipo -qopt-prefetch=0 -ipo

C++ benchmarks:
   -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fno-alias -ipo

Fortran benchmarks:
350.md: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high
   -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
   -ipo -qopt-prefetch=0 -ipo -align all
351.bwaves: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high
   -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
   -qopt-prefetch=2 -ipo -align all
357.bt331: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high
   -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
   -qopt-prefetch=1 -ipo -align all
Intel
Intel Server System M70KLP (Intel Xeon Platinum 8360Y, 2.40 GHz)

SPECompG_peak2012 = 39.0
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Peak Optimization Flags (Continued)

360.ilbdc: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high
-fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
-qopt-prefetch=4 -ipo -align all

362.fma3d: Same as 350.md

363.swim: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high
-fp-model fast=2 -no-prec-div -no-prec-sqrt -fno-alias
-qopt-malloc-options=3 -qopt-prefetch=0 -ipo -align all

370.mgrid331: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fno-alias
-ipo -align all

371.applu331: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high
-fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt
-qopt-prefetch=0 -align all

The flags file that was used to format this result can be browsed at
http://www.spec.org/omp2012/flags/Intel-ic19-linux64.20210507.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/omp2012/flags/Intel-ic19-linux64.20210507.xml

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC OMP2012 v1.1.
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