## Huawei 5288 V5 (Intel Xeon Gold 6142)

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>SPECrate2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>177</td>
<td>181</td>
</tr>
</tbody>
</table>

**Cpu2017 License:** 3175  
**Test Sponsor:** Huawei  
**Tested by:** Huawei  
**Hardware Availability:** Jul-2017  
**Test Date:** May-2018  
**Software Availability:** Jan-2018  

### Hardware

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Gold 6142</td>
</tr>
<tr>
<td>Max MHz.</td>
<td>3700</td>
</tr>
<tr>
<td>Nominal</td>
<td>2600</td>
</tr>
<tr>
<td>Enabled</td>
<td>32 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Cache L2</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Cache L3</td>
<td>22 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 1200 GB SAS, 10000 RPM</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
</table>
| OS | Red Hat Enterprise Linux Server release 7.4 (Maipo)  
| Compiler | C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux |
| Parallel | No |
| Firmware | Version 0.62 Released Mar-2018 |
| File System | xfs |
| System State | Run level 3 (multi-user) |
| Base Pointers | 64-bit |
| Peak Pointers | 64-bit |
| Other | None |
### SPEC CPU2017 Floating Point Rate Result

**Huawei**

Huawei 5288 V5 (Intel Xeon Gold 6142)

**SPECrate2017_fp_base = 177**

**SPECrate2017_fp_peak = 181**

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</tr>
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#### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak Copies</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>64</td>
<td>1380</td>
<td>465</td>
<td>1379</td>
<td>465</td>
<td></td>
<td>1375</td>
<td>467</td>
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<tr>
<td>507.cactuBSSN_r</td>
<td>64</td>
<td>503</td>
<td>161</td>
<td>503</td>
<td>161</td>
<td></td>
<td>502</td>
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<td></td>
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<tr>
<td>508.namd_r</td>
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<td>450</td>
<td>135</td>
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<td></td>
<td>452</td>
<td>135</td>
<td></td>
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<tr>
<td>510.parest_r</td>
<td>64</td>
<td>1575</td>
<td>106</td>
<td>1577</td>
<td>106</td>
<td></td>
<td>1579</td>
<td>106</td>
<td></td>
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<td>511.povray_r</td>
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<td>519.lbm_r</td>
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<td>633</td>
<td>107</td>
<td>633</td>
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<td></td>
<td>633</td>
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<td></td>
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<tr>
<td>521.wrf_r</td>
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<td>702</td>
<td>204</td>
<td>706</td>
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<td>703</td>
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<td>526.blender_r</td>
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<td>510</td>
<td>191</td>
<td></td>
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<tr>
<td>527.cam4_r</td>
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<td>538.imagick_r</td>
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<tr>
<td>544.nab_r</td>
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<td>250</td>
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<td></td>
<td>430</td>
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</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>64</td>
<td>1763</td>
<td>141</td>
<td>1762</td>
<td>142</td>
<td></td>
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<td>142</td>
<td></td>
</tr>
<tr>
<td>554.roms_r</td>
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<td>85.8</td>
<td>1188</td>
<td>85.6</td>
<td></td>
<td>1188</td>
<td>85.6</td>
<td></td>
</tr>
</tbody>
</table>

**SPECrate2017_fp_base = 177**

**SPECrate2017_fp_peak = 181**

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

#### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor.

For details, please see the config file.

#### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

#### General Notes

Environment variables set by runcpu before the start of the run:
```
```

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:
```
sync; echo 3> /proc/sys/vm/drop_caches
```

runcpu command invoked through numactl i.e.:
```
numactl --interleave=all runcpu <etc>
```

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
## SPEC CPU2017 Floating Point Rate Result

### Huawei

**Huawei 5288 V5 (Intel Xeon Gold 6142)**

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CPU2017 License: 3175  
Test Sponsor: Huawei  
Hardware Availability: Jul-2017  
Test Date: May-2018  
Software Availability: Jan-2018  
Tested by: Huawei

### General Notes (Continued)

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.

### Platform Notes

BIOS configuration:  
Power Policy Set to Performance  
SNC Set to Enabled  
IMC Interleaving Set to 1-way Interleave  
XPT Prefetch Set to Enabled  
Sysinfo program /spec2017/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f  
runtime on localhost.localdomain Fri May 11 10:21:18 2018

SUT (System Under Test) info as seen by some common utilities.  
For more information on this section, see  
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo

```plaintext
model name : Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz
  2 "physical id"s (chips)
  64 "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 : 16
  siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

From lscpu:

```plaintext
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz
Stepping: 4
```

(Continued on next page)
### SPEC CPU2017 Floating Point Rate Result

**Huawei**

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**Test Sponsor:** Huawei  
**Test Date:** May-2018  
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#### Platform Notes (Continued)

- **CPU MHz:** 2600.000
- **BogoMIPS:** 5200.00
- **Virtualization:** VT-x
- **L1d cache:** 32K  
**L1i cache:** 32K  
**L2 cache:** 1024K  
**L3 cache:** 22528K
- **NUMA node0 CPU(s):** 0-3,8-11,32-35,40-43  
**NUMA node1 CPU(s):** 4-7,12-15,36-39,44-47  
**NUMA node2 CPU(s):** 16-19,24-27,48-51,56-59  
**NUMA node3 CPU(s):** 20-23,28-31,52-55,60-63
- **Flags:** fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  
**node0 cpus:** 0 1 2 3 8 9 10 11 32 33 34 35 40 41 42 43  
**node0 size:** 96437 MB  
**node0 free:** 93250 MB  
**node0 cpus:** 4 5 6 7 12 13 14 15 36 37 38 39 44 45 46 47  
**node0 size:** 98304 MB  
**node0 free:** 95897 MB  
**node2 cpus:** 16 17 18 19 24 25 26 27 48 49 50 51 56 57 58 59  
**node2 size:** 98304 MB  
**node2 free:** 95915 MB  
**node3 cpus:** 20 21 22 23 28 29 30 31 52 53 54 55 60 61 62 63  
**node3 size:** 98304 MB  
**node3 free:** 95899 MB  
**node distances:**  
<table>
<thead>
<tr>
<th>node</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
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<tbody>
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<td>0</td>
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<td>11</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>1</td>
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<td>2</td>
<td>21</td>
<td>21</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>11</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

From numactl --hardware  
**WARNING:** a numactl 'node' might or might not correspond to a physical chip.

**node distances:**

<table>
<thead>
<tr>
<th>node</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>11</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>10</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
<td>21</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>11</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>
Platform Notes (Continued)

From /proc/meminfo
    MemTotal: 394174812 kB
    HugePages_Total: 0
    Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
    os-release:
        NAME="Red Hat Enterprise Linux Server"
        VERSION="7.4 (Maipo)"
        ID="rhel"
        ID_LIKE="fedora"
        VARIANT="Server"
        VARIANT_ID="server"
        VERSION_ID="7.4"
        PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
    redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
    system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

uname -a:
    Linux localhost.localdomain 3.10.0-693.11.6.el7.x86_64 #1 SMP Thu Dec 28 14:23:39 EST 2017 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 11 10:11

SPEC is set to: /spec2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda2      xfs   781G   28G  754G   4% /

Additional information from dmidecode follows. 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.
    BIOS INSYDE Corp. 0.62 03/26/2018
    Memory:
        24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
  CC  519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base)
==============================================================================

icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
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Huawei 5288 V5 (Intel Xeon Gold 6142)

SPEC CPU2017 Floating Point Rate Result

Huawei

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Compiler Version Notes (Continued)

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==============================================================================
CXXC 508.namd_r(base) 510.parest_r(base)
icpc (ICC) 18.0.0 20170811
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==============================================================================
CXXC 508.namd_r(peak) 510.parest_r(peak)
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ifort (IFORT) 18.0.0 20170811

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==============================================================================
 FC 507.cactuBSSN_r(peak)

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 icpc (ICC) 18.0.0 20170811
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 icc (ICC) 18.0.0 20170811
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## SPEC CPU2017 Floating Point Rate Result

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</tbody>
</table>

### Base Compiler Invocation

C benchmarks:  
icc  
C++ benchmarks:  
icpc  
Fortran benchmarks:  
ifort  
Benchmarks using both Fortran and C:  
ifort icc  
Benchmarks using both C and C++:  
icpc icc  
Benchmarks using Fortran, C, and C++:  
icpc icc ifort

### Base Portability Flags

<table>
<thead>
<tr>
<th>Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
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<tr>
<td>519.lbm_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>-DSPEC_LP64 -DSPEC_LINUX -funsigned-char</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG</td>
</tr>
<tr>
<td>538.imagick_r</td>
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</tr>
<tr>
<td>544.nab_r</td>
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</tr>
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</tr>
</tbody>
</table>

### Base Optimization Flags

C benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3  
C++ benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

Huawei
Huawei 5288 V5 (Intel Xeon Gold 6142)

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Software Availability: Jan-2018

Base Optimization Flags (Continued)

C++ benchmarks (continued):
- qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Base Other Flags

C benchmarks:
- m64 -std=c11

C++ benchmarks:
- m64

Fortran benchmarks:
- m64

Benchmarks using both Fortran and C:
- m64 -std=c11

Benchmarks using both C and C++:
- m64 -std=c11

Benchmarks using Fortran, C, and C++:
- m64 -std=c11
Huawei

Huawei 5288 V5 (Intel Xeon Gold 6142)

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CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Test Date: May-2018
Hardware Availability: Jul-2017
Software Availability: Jan-2018

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

544.nab_r: Same as 519.lbm_r

C++ benchmarks:

-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

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Peak Optimization Flags (Continued)

503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3
-nostandard-realloc-lhs -align array32byte

549.fotonik3d_r: basepeak = yes

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
507.cactuBSSN_r: basepeak = yes

Peak Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Benchmarks using both Fortran and C:
-m64 -std=c11

Benchmarks using both C and C++:
-m64 -std=c11

Benchmarks using Fortran, C, and C++:
-m64 -std=c11
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The flags files that were used to format this result can be browsed at  
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html  

You can also download the XML flags sources by saving the following links:  
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml  
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.9-revC.xml

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

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