Huawei CH242 V5 (Intel Xeon Gold 5122)

**CPU2017 License:** 3175  
**Test Date:** Jul-2018  
**Hardware Availability:** Jul-2017

**Test Sponsor:** Huawei  
**Tested by:** Huawei  
**Software Availability:** Jan-2018

**CPU Name:** Intel Xeon Gold 5122  
**Max MHz.:** 3700  
**Nominal:** 3600  
**Enabled:** 16 cores, 4 chips  
**Orderable:** 2,4 chips  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 1 MB I+D on chip per core  
**L3:** 16.5 MB I+D on chip per chip  
**Other:** None  
**Memory:** 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)  
**Storage:** 1 x 1200 GB SAS, 10000 RPM  
**Other:** None

**OS:** Red Hat Enterprise Linux Server release 7.3 (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:** Yes  
**Firmware:** Version 0.84 Released Mar-2018  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 64-bit  
**Other:** None

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**Threads**

<table>
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<tr>
<th>Test</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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<tr>
<td>603.bwaves_s</td>
<td>16</td>
<td>78.2</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>619.lbm_s</td>
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<tr>
<td>621.wrf_s</td>
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<td>627.cam4_s</td>
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<td>628.pop2_s</td>
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<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>654.roms_s</td>
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</tr>
</tbody>
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**Software**

**OS:** Red Hat Enterprise Linux Server release 7.3 (Maipo)  
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**Other:** None
Huawei
Huawei CH242 V5 (Intel Xeon Gold 5122)

SPECspeed2017_fp_base = 81.7
SPECspeed2017_fp_peak = 83.7

Results Table

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<tr>
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</tbody>
</table>

SPECspeed2017_fp_base = 81.7
SPECspeed2017_fp_peak = 83.7

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

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:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/spec/lib/ia32:/spec/lib/intel64:/spec/je5.0.1-32:/spec/je5.0.1-64"
OMP_STACKSIZE = "192M"

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
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.

Platform Notes

BIOS configuration:
Power Policy Set to Load Balance
Hyper-Threading Set to Disable

(Continued on next page)
Huawei CH242 V5 (Intel Xeon Gold 5122)

<table>
<thead>
<tr>
<th>SPEC CPU2017 License:</th>
<th>3175</th>
<th>Test Sponsor:</th>
<th>Huawei</th>
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<td>Huawei</td>
<td>Software Availability:</td>
<td>Jan-2018</td>
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**SPEC CPU2017 Floating Point Speed Result**

**SPECspeed2017_fp_peak = 83.7**  
**SPECspeed2017_fp_base = 81.7**

---

**Platform Notes (Continued)**

XPT Prefetch Set to Enabled  
Sysinfo program /spec/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f  
running on localhost.localdomain Tue Jul 3 10:22:42 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  
model name : Intel(R) Xeon(R) Gold 5122 CPU @ 3.60GHz  
4 "physical id"s (chips)  
16 "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 : 4  
- siblings : 4  
- physical 0: cores 1 5 9 13  
- physical 1: cores 1 3 4 10  
- physical 2: cores 0 5 9 13  
- physical 3: cores 1 5 9 13

From lscpu:  
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 16  
On-line CPU(s) list: 0-15  
Thread(s) per core: 1  
Core(s) per socket: 4  
Socket(s): 4  
NUMA node(s): 4  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Gold 5122 CPU @ 3.60GHz  
Stepping: 4  
CPU MHz: 3601.000  
BogoMIPS: 7208.40  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 16896K  
NUMA node0 CPU(s): 0-3  
NUMA node1 CPU(s): 4-7  
NUMA node2 CPU(s): 8-11

(Continued on next page)
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Platform Notes (Continued)

NUMA node3 CPU(s): 12–15

/proc/cpuinfo cache data
  cache size : 16896 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 4 nodes (0-3)
  node 0 cpus: 0 1 2 3
  node 0 size: 391577 MB
  node 0 free: 382319 MB
  node 1 cpus: 4 5 6 7
  node 1 size: 393216 MB
  node 1 free: 384218 MB
  node 2 cpus: 8 9 10 11
  node 2 size: 393216 MB
  node 2 free: 384387 MB
  node 3 cpus: 12 13 14 15
  node 3 size: 393216 MB
  node 3 free: 384380 MB
  node distances:
    node 0: 10 21 31 21
    node 1: 21 10 21 31
    node 2: 31 21 10 21
    node 3: 21 31 21 10

From /proc/meminfo
  MemTotal: 1583347128 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.3 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="7.3"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
    ANSI_COLOR="0;31"
    CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
  redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)

uname -a:

(Continued on next page)
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Platform Notes (Continued)

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 Jul 3 05:06

SPEC is set to: /spec
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 600G 22G 579G 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. 0.84 03/26/2018
Memory:
40x Hynix HMA84GR7AFR4N-VK 32 GB 2 rank 2666
8x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

CC 619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

CC 619.lbm_s(peak)
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

FC 607.cactuBSSN_s(base)
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
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Huawei CH242 V5 (Intel Xeon Gold 5122)

SPECspeed2017_fp_base = 81.7
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CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Jul-2018
Hardware Availability: Jul-2017
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Compiler Version Notes (Continued)

==============================================================================
FC  607.cactuBSSN_s(peak)

icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================

==============================================================================
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

ifort (IFORT) 18.0.0 20170811
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==============================================================================

==============================================================================
CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)

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Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
**SPEC CPU2017 Floating Point Speed Result**

**Huawei**

**Huawei CH242 V5 (Intel Xeon Gold 5122)**

| SPECspeed2017_fp_base | 81.7 |
| SPECspeed2017_fp_peak | 83.7 |

**CPU2017 License:** 3175  
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### Base Compiler Invocation

C benchmarks:

- icc

Fortran benchmarks:

- ifort

Benchmarks using both Fortran and C:

- ifort icc

Benchmarks using Fortran, C, and C++:

- icpc icc ifort

### Base Portability Flags

- 603.bwaves_s: -DSPEC_LP64
- 607.cactuBSSN_s: -DSPEC_LP64
- 619.lbm_s: -DSPEC_LP64
- 621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
- 627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
- 628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
- 638.imagick_s: -DSPEC_LP64
- 644.nab_s: -DSPEC_LP64
- 649.fotonik3d_s: -DSPEC_LP64
- 654.roms_s: -DSPEC_LP64

### Base Optimization Flags

C benchmarks:

- xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:

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

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## Base Optimization Flags (Continued)

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

## Base Other Flags

**C benchmarks:**  
- `-m64`  
- `-std=c11`

**Fortran benchmarks:**  
- `-m64`

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

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

## Peak Compiler Invocation

**C benchmarks:**  
- `icc`

**Fortran benchmarks:**  
- `ifort`

**Benchmarks using both Fortran and C:**  
- `ifort`  
- `icc`

**Benchmarks using Fortran, C, and C++:**  
- `icpc`  
- `icc`  
- `ifort`

## Peak Portability Flags

*Same as Base Portability Flags*
Huawei

Huawei CH242 V5 (Intel Xeon Gold 5122)

SPECspeed2017_fp_base = 81.7
SPECspeed2017_fp_peak = 83.7

Peak Optimization Flags

C benchmarks:

619.lbm_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2
-ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP

638.imagick_s: basepeak = yes

644.nab_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: basepeak = yes

654.roms_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
-DSPEC_OPENMP -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
-qopenmp -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

627.cam4_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -qopt-prefetch
-ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
-align array32byte
Huawei CH242 V5 (Intel Xeon Gold 5122)

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Tested by: Huawei

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Software Availability: Jan-2018

Peak Other Flags

C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

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

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

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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