Huawei XH321 V5 (Intel Xeon Gold 6142)

SPECspeed2017_fp_base = 112
SPECspeed2017_fp_peak = 114

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

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

Threads

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<th>SPECspeed2017_fp_base (112)</th>
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<tr>
<td>603.bwaves_s 32</td>
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<tr>
<td>607.cactuBSSN_s 32</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s 32</td>
<td></td>
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<tr>
<td>621.wrf_s 32</td>
<td></td>
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<tr>
<td>627.cam4_s 32</td>
<td></td>
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<tr>
<td>628.pop2_s 32</td>
<td></td>
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<tr>
<td>638.imagick_s 32</td>
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<tr>
<td>644.nab_s 32</td>
<td></td>
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<tr>
<td>649.fotonik3d_s 32</td>
<td></td>
</tr>
<tr>
<td>654.roms_s 32</td>
<td></td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Gold 6142
Max MHz.: 3700
Nominal: 2600
Enabled: 32 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 22 MB I+D on chip per chip
Other: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)
Storage: 1 x 1200 GB SAS, 10000 RPM
Other: None

Software

OS: Red Hat Enterprise Linux Server release 7.3 (Maipo) 3.10.0-693.11.6.el7.x86_64
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 0.59 Released Feb-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 Speed Result

Huawei
Huawei XH321 V5 (Intel Xeon Gold 6142)

SPECspeed2017_fp_base = 112
SPECspeed2017_fp_peak = 114

Results Table

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<td>142</td>
<td>105</td>
<td>150</td>
</tr>
</tbody>
</table>

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 Efficiency Mode Set to Custom
Hyper-Threading Set to Disable

(Continued on next page)
Huawei

Huawei XH321 V5 (Intel Xeon Gold 6142)  

---

**Platform Notes (Continued)**

ADDDC Sparing Set to Disabled
Sysinfo program /spec/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b091c0f
running on localhost.localdomain Tue May 22 21:08:23 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 6142 CPU @ 2.60GHz
  2 "physical id"s (chips)
  32 "processors"
cores, siblings (counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 16
siblings : 16
  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:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 1
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 2601.000
BogoMIPS: 5205.38
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31

/proc/cpuinfo cache data
  cache size : 22528 KB

---
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Huawei XH321 V5 (Intel Xeon Gold 6142)

SPEC CPU2017 Floating Point Speed Result

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Huawei XH321 V5 (Intel Xeon Gold 6142)

SPECspeed2017_fp_peak = 114
SPECspeed2017_fp_base = 112

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: May-2018
Tested by: Huawei
Hardware Availability: Jul-2017
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Platform Notes (Continued)

From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
node 0 size: 194741 MB
node 0 free: 189778 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 196608 MB
node 1 free: 191176 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 394174996 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:
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 22 15:42

SPEC is set to: /spec

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda8 xfs 325G 29G 297G 9% /

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

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

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CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: May-2018
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Platform Notes (Continued)

frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS INSYDE Corp. 0.59 02/24/2018
Memory:
4x NO DIMM NO DIMM
12x 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.             |
==============================================================================

==============================================================================
| 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.             |
==============================================================================

(Continued on next page)
**Huawei**

**Huawei XH321 V5 (Intel Xeon Gold 6142)**

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

Test Date: May-2018  
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---

**Compiler Version Notes (Continued)**

```plaintext
FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
FC 603.bwaves_s(peak) 649.fotonik3d_s(peak) 654.roms_s(peak)

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

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

ifort (IFORT) 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.
```

```plaintext
CC 621.wrf_s(peak) 628.pop2_s(peak)

ifort (IFORT) 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.
```

---

**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
Huawei
Huawei XH321 V5 (Intel Xeon Gold 6142)

<table>
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<td>Software Availability:</td>
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</table>

### 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
-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
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

**Benchmarks using Fortran, C, and C++:**
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-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

(Continued on next page)
### Huawei

Huawei XH321 V5 (Intel Xeon Gold 6142)

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**Test Date:** May-2018  
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**Software Availability:** Jan-2018

#### Base Other Flags (Continued)

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

#### Peak Optimization Flags

**C benchmarks:**

- `619.lbm_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`

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

- `644.nab_s`: Same as `638.imagick_s`

(Continued on next page)
Huawei XH321 V5 (Intel Xeon Gold 6142)

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### Peak Optimization Flags (Continued)

Fortran benchmarks:

603.bwaves_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

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

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: basepeak = yes

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

### 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
Huawei

Huawei XH321 V5 (Intel Xeon Gold 6142)

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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.

Tested with SPEC CPU2017 v1.0.2 on 2018-05-22 21:08:22-0400.
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