



SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

New H3C Technologies Co., Ltd.

SPECrate2017_fp_base = 412

H3C UniServer R6900 G3 (Intel Xeon Gold 6148)

SPECrate2017_fp_peak = Not Run

CPU2017 License: 9066

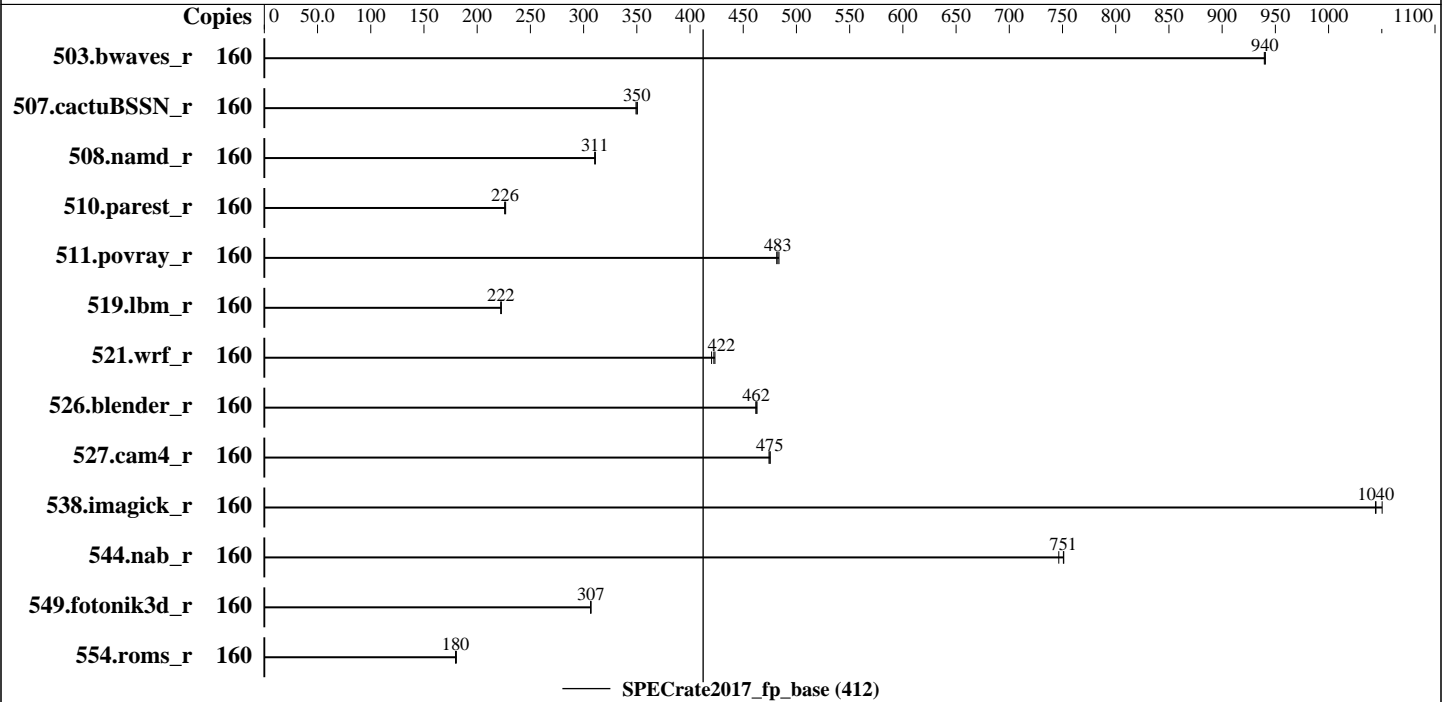
Test Date: May-2018

Test Sponsor: New H3C Technologies Co., Ltd.

Hardware Availability: Sep-2017

Tested by: New H3C Technologies Co., Ltd.

Software Availability: Mar-2018



Hardware

CPU Name: Intel Xeon Gold 6148
 Max MHz.: 3700
 Nominal: 2400
 Enabled: 80 cores, 4 chips, 2 threads/core
 Orderable: 1,2,3,4 chips
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 27.5 MB I+D on chip per chip
 Other: None
 Memory: 768 GB (48 x 16 GB 2Rx8 PC4-2666V-R)
 Storage: 480 GB SATA SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP3
 4.4.126-48-default
 Compiler: C/C++: Version 18.0.2.20180210 of Intel C/C++
 Compiler for Linux;
 Fortran: Version 18.0.2.20180210 of Intel Fortran
 Compiler for Linux
 Parallel: No
 Firmware: INSYDE Corp. BIOS Version 1.00.14 Released Mar-2018
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: None



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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	160	<u>1707</u>	<u>940</u>	1706	941	1708	940							
507.cactuBSSN_r	160	<u>579</u>	<u>350</u>	580	349	578	351							
508.namd_r	160	489	311	489	311	<u>489</u>	<u>311</u>							
510.parest_r	160	1853	226	1846	227	<u>1850</u>	<u>226</u>							
511.povray_r	160	773	484	<u>774</u>	<u>483</u>	776	481							
519.lbm_r	160	<u>758</u>	<u>222</u>	759	222	757	223							
521.wrf_r	160	846	423	<u>849</u>	<u>422</u>	853	420							
526.blender_r	160	526	463	<u>527</u>	<u>462</u>	528	462							
527.cam4_r	160	590	474	<u>589</u>	<u>475</u>	589	475							
538.imagick_r	160	<u>381</u>	<u>1040</u>	381	1040	379	1050							
544.nab_r	160	358	751	<u>359</u>	<u>751</u>	361	746							
549.fotonik3d_r	160	2033	307	<u>2032</u>	<u>307</u>	2032	307							
554.roms_r	160	<u>1414</u>	<u>180</u>	1409	180	1415	180							

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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:
LD_LIBRARY_PATH = "/data/lib/ia32:/data/lib/intel64:/data/je5.0.1-32:/data/je5.0.1-64"

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.

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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:

Set SNC to Enabled

Set Power Supply Mode to Performance

Set IMC Interleaving to 1-way

Set DCU Streamer Prefetcher to disabled

Set LLC dead line alloc to disabled

Set XPT Prefetcher to Enabled

Sysinfo program /data/bin/sysinfo

Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f

running on linux-ybml Tue May 8 08:02:38 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 6148 CPU @ 2.40GHz

4 "physical id"s (chips)

160 "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 : 20

siblings : 40

physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

physical 3: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:

Architecture: x86_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 160

On-line CPU(s) list: 0-159

Thread(s) per core: 2

Core(s) per socket: 20

Socket(s): 4

NUMA node(s): 8

Vendor ID: GenuineIntel

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Platform Notes (Continued)

```

CPU family:           6
Model:                85
Model name:           Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz
Stepping:             4
CPU MHz:              1701.472
CPU max MHz:          3700.0000
CPU min MHz:          1000.0000
BogoMIPS:             4788.97
Virtualization:       VT-x
L1d cache:            32K
L1i cache:            32K
L2 cache:             1024K
L3 cache:             28160K
NUMA node0 CPU(s):   0-2,5,6,10-12,15,16,80-82,85,86,90-92,95,96
NUMA node1 CPU(s):   3,4,7-9,13,14,17-19,83,84,87-89,93,94,97-99
NUMA node2 CPU(s):   20-22,25,26,30-32,35,36,100-102,105,106,110-112,115,116
NUMA node3 CPU(s):   23,24,27-29,33,34,37-39,103,104,107-109,113,114,117-119
NUMA node4 CPU(s):   40-42,45,46,50-52,55,56,120-122,125,126,130-132,135,136
NUMA node5 CPU(s):   43,44,47-49,53,54,57-59,123,124,127-129,133,134,137-139
NUMA node6 CPU(s):   60-62,65,66,70-72,75,76,140-142,145,146,150-152,155,156
NUMA node7 CPU(s):   63,64,67-69,73,74,77-79,143,144,147-149,153,154,157-159
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
aperfmpperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
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 ida arat epb invpcid_single pln pts
dtherm hwp hwp_act_window hwp_epp hwp_pkg_req intel_pt rsb_ctxsw spec_ctrl stibp
retpoline kaiser tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle
avx2 smep bmi2 erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt
clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc pku
ospke

```

```

/proc/cpuinfo cache data
cache size : 28160 KB

```

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

```

available: 8 nodes (0-7)
node 0 cpus: 0 1 2 5 6 10 11 12 15 16 80 81 82 85 86 90 91 92 95 96
node 0 size: 95052 MB
node 0 free: 94296 MB
node 1 cpus: 3 4 7 8 9 13 14 17 18 19 83 84 87 88 89 93 94 97 98 99
node 1 size: 96760 MB
node 1 free: 95510 MB
node 2 cpus: 20 21 22 25 26 30 31 32 35 36 100 101 102 105 106 110 111 112 115 116
node 2 size: 96760 MB

```

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Platform Notes (Continued)

```

node 2 free: 96412 MB
node 3 cpus: 23 24 27 28 29 33 34 37 38 39 103 104 107 108 109 113 114 117 118 119
node 3 size: 96760 MB
node 3 free: 96411 MB
node 4 cpus: 40 41 42 45 46 50 51 52 55 56 120 121 122 125 126 130 131 132 135 136
node 4 size: 96760 MB
node 4 free: 96409 MB
node 5 cpus: 43 44 47 48 49 53 54 57 58 59 123 124 127 128 129 133 134 137 138 139
node 5 size: 96760 MB
node 5 free: 96429 MB
node 6 cpus: 60 61 62 65 66 70 71 72 75 76 140 141 142 145 146 150 151 152 155 156
node 6 size: 96760 MB
node 6 free: 96423 MB
node 7 cpus: 63 64 67 68 69 73 74 77 78 79 143 144 147 148 149 153 154 157 158 159
node 7 size: 96744 MB
node 7 free: 96401 MB
node distances:
node  0  1  2  3  4  5  6  7
  0: 10 20 20 20 20 20 20 20
  1: 20 10 20 20 20 20 20 20
  2: 20 20 10 20 20 20 20 20
  3: 20 20 20 10 20 20 20 20
  4: 20 20 20 20 10 20 20 20
  5: 20 20 20 20 20 10 20 20
  6: 20 20 20 20 20 20 10 20
  7: 20 20 20 20 20 20 20 10

```

```

From /proc/meminfo
MemTotal:      790898264 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP3

```

```

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 3
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.
os-release:
NAME="SLES"
VERSION="12-SP3"
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"

```

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Platform Notes (Continued)

```
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"
```

```
uname -a:
Linux linux-ybml 4.4.126-48-default #1 SMP Sat Apr 7 05:22:50 UTC 2018 (f24992c)
x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 May 7 20:09
```

```
SPEC is set to: /data
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal       xfs   447G  8.4G  439G   2% /data
```

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. 1.00.14 03/30/2018
Memory:
48x Hynix HMA82GR7AFR8N-VK 16 GB 2 rank 2666
```

(End of data from sysinfo program)

Compiler Version Notes

```
=====
CC 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
-----
```

```
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----
```

```
=====
CXXC 508.namd_r(base) 510.parest_r(base)
-----
```

```
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----
```

```
=====
CC 511.povray_r(base) 526.blender_r(base)
-----
```

```
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
```

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Compiler Version Notes (Continued)

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 507.cactuBSSN_r(base)

icpc (ICC) 18.0.2 20180210

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

icc (ICC) 18.0.2 20180210

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

ifort (IFORT) 18.0.2 20180210

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)

ifort (IFORT) 18.0.2 20180210

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CC 521.wrf_r(base) 527.cam4_r(base)

ifort (IFORT) 18.0.2 20180210

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

icc (ICC) 18.0.2 20180210

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:

icc -m64 -std=c11

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:

icpc -m64 icc -m64 -std=c11

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Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:

```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

Base Portability Flags

```
503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64
```

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
-qopt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Benchmarks using both C and C++:

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

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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 -auto -nostandard-realloc-lhs
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.html>

http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.2-SKL-RevD.html

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml>

http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.2-SKL-RevD.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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