Huawei

Huawei 2288H V5 (Intel Xeon Silver 4108)

SPECrater2017_int_base = 65.1
SPECrater2017_int_peak = 69.0

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

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

CPU Name: Intel Xeon Silver 4108
Max MHz.: 3000
Nominal: 1800
Enabled: 16 cores, 2 chips, 2 threads/core
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: 11 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
Storage: 1 x 1200 GB SAS, 10000 RPM
Other: None

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: 32/64-bit
Other: jemalloc: jemalloc memory allocator library V5.0.1;
Huawei

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Results Table

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<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>49.2</td>
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<td>49.0</td>
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<td>60.6</td>
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<td>82.1</td>
<td>643</td>
<td>80.4</td>
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<td>520.omnetpp_r</td>
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<td>523.xalancbmk_r</td>
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<td>525.x264_r</td>
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<td>55.0</td>
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<td>49.8</td>
<td>1064</td>
<td>49.8</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>715</td>
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<td>714</td>
<td>117</td>
<td>715</td>
<td>117</td>
</tr>
<tr>
<td>557.xz_r</td>
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<td>692</td>
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<td>754</td>
<td>45.9</td>
<td>753</td>
<td>45.9</td>
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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:

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>
jemalloc: configured and built at default for
32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4,
and the system compiler gcc 4.8.5;
jemalloc: sources available from jemalloc.net or

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

General Notes (Continued)

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 Performance
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Thu Jul 19 04:27:38 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) Silver 4108 CPU @ 1.80GHz
      2 "physical id"s (chips)
      32 "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 : 8
    siblings : 16
    physical 0: cores 0 1 2 3 4 5 6 7
    physical 1: cores 0 1 2 3 4 5 6 7

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: 2
    Core(s) per socket: 8
    Socket(s): 2
    NUMA node(s): 2
    Vendor ID: GenuineIntel
    CPU family: 6
    Model: 85
    Model name: Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
    Stepping: 4

(Continued on next page)
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Software Availability: Jan-2018

Platform Notes (Continued)

CPU MHz: 1800.000
BogoMIPS: 3600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
Flags: fpu vme de pse 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 cpb cat_l3 cdp_l3 invpcid_single intel_pt
        spec_ctrl ibp0_support tpr_shadow vmcs flexpriority ept vpid fsgsbase tsc_adjust
        bmi1 hle avx2 smep bmi2  invpcid rdtscp rtm cqm mpx rdt_a avx512f avx512dq rdseed adx
        smap clflushopt clwb avx512fd avx512bw avx512vl xsaveopt xsaves xgetbv1 cqm_llc
        cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts

/proc/cpuinfo cache data
  cache size : 11264 KB

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 16 17 18 19 20 21 22 23
  node 0 size: 195701 MB
  node 0 free: 189374 MB
  node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
  node 1 size: 196608 MB
  node 1 free: 190819 MB
  node distances:
    node 0 1
      0: 10 21
      1: 21 10

From /proc/meminfo
  MemTotal: 395141240 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"

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Platform Notes (Continued)

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 Jul 16 13:28

SPEC is set to: /spec2017  
Filesystem     Type Size Used Avail Use% Mounted on  
/dev/sda4      xfs  700G  35G  666G   5% /

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, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
 CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)  
      525.x264_r(base, peak) 557.xz_r(base, peak)
==============================================================================
 icc (ICC) 18.0.0 20170811
 Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================

==============================================================================
 CC  500.perlbench_r(peak) 502.gcc_r(peak)
==============================================================================
 icc (ICC) 18.0.0 20170811
 Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================

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**Compiler Version Notes (Continued)**

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<tr>
<td>Fortran benchmarks</td>
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**Base Portability Flags**

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64

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| SPECrate2017_int_base | 65.1 |
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CPU2017 License: 3175  
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Test Date: Jul-2018

Base Portability Flags (Continued)

541.leela_r: -DSPEC_LP64  
548.exchange2_r: -DSPEC_LP64  
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte  
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
### SPEC CPU2017 Integer Rate Result

**Huawei**

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**SPECrate2017_int_base = 65.1**

**SPECrate2017_int_peak = 69.0**

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### Peak Portability Flags

- 500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
- 502.gcc_r: -D_FILE_OFFSET_BITS=64
- 505.mcf_r: -DSPEC_LP64
- 520.omnetpp_r: -DSPEC_LP64
- 523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
- 525.x264_r: -DSPEC_LP64
- 531.deepsjeng_r: -DSPEC_LP64
- 541.leela_r: -DSPEC_LP64
- 548.exchange2_r: -DSPEC_LP64
- 557.xz_r: -DSPEC_LP64

---

### Peak Optimization Flags

**C benchmarks:**

- 500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
  -xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
  -fno-strict-overflow -L/usr/local/je5.0.1-64/lib
  -ljemalloc

- 502.gcc_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
  -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
  -xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
  -L/usr/local/je5.0.1-32/lib -ljemalloc

- 505.mcf_r: basepeak = yes

- 525.x264_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
  -qopt-mem-layout-trans=3 -fno-alias
  -L/usr/local/je5.0.1-64/lib -ljemalloc

- 557.xz_r: basepeak = yes

**C++ benchmarks:**

- 520.omnetpp_r: basepeak = yes

- 523.xalancbmk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
  -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
  -xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
  -L/usr/local/je5.0.1-32/lib -ljemalloc

- 531.deepsjeng_r: basepeak = yes

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</table>

#### Peak Optimization Flags (Continued)

541.leela_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3  
-L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:  
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte  
-L/usr/local/je5.0.1-64/lib -ljemalloc

#### Peak Other Flags

C benchmarks (except as noted below):  
-m64 -std=c11

502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):  
-m64

523.xalancbmk_r: -m32

Fortran benchmarks:  
-m64

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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