Huawei

Huawei 2288 V5 (Intel Xeon Bronze 3204)

**SPECrate2017_int_base** = 40.1

**SPECrate2017_int_peak** = 41.2

---

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon Bronze 3204</td>
<td>OS: SUSE Linux Enterprise Server 12 SP4 (x86_64)</td>
</tr>
<tr>
<td>Max MHz.: 1900</td>
<td>Compiler: C/C++: Version 19.0.1.144 of Intel C/C++</td>
</tr>
<tr>
<td>Nominal: 1900</td>
<td>Compiler Build 20181018 for Linux; Fortran: Version 19.0.1.144 of Intel Fortran</td>
</tr>
<tr>
<td>Enabled: 12 cores, 2 chips</td>
<td>Firmware: Version 6.52 Released Mar-2019</td>
</tr>
<tr>
<td>Orderable: 1.2 chips</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>L3: 8.25 MB I+D on chip per chip</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Other: None</td>
<td>Other: jemalloc memory allocator V5.0.1</td>
</tr>
<tr>
<td>Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R, running at 2133)</td>
<td></td>
</tr>
<tr>
<td>Storage: 1 x 1200 GB SAS, 10000 RPM</td>
<td></td>
</tr>
<tr>
<td>Other: None</td>
<td></td>
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</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate2017_int_peak</th>
<th>SPECrate2017_int_base</th>
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<tbody>
<tr>
<td>500.perlbench_r 12</td>
<td>32.6</td>
<td>38.6</td>
</tr>
<tr>
<td>502.gcc_r 12</td>
<td>40.4</td>
<td>40.4</td>
</tr>
<tr>
<td>505.mcf_r 12</td>
<td>50.6</td>
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<tr>
<td>520.omnetpp_r 12</td>
<td>30.6</td>
<td></td>
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<tr>
<td>523.xalancbmk_r 12</td>
<td>50.4</td>
<td></td>
</tr>
<tr>
<td>525.x264_r 12</td>
<td>70.8</td>
<td>74.0</td>
</tr>
<tr>
<td>531.deepsjeng_r 12</td>
<td>32.6</td>
<td>32.6</td>
</tr>
<tr>
<td>541.leela_r 12</td>
<td>27.0</td>
<td>27.0</td>
</tr>
<tr>
<td>548.exchange2_r 12</td>
<td>73.8</td>
<td>73.8</td>
</tr>
<tr>
<td>557.xz_r 12</td>
<td>24.0</td>
<td>24.0</td>
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</table>
Huawei
Huawei 2288 V5 (Intel Xeon Bronze 3204)

SPECrate2017_int_base = 40.1
SPECrate2017_int_peak = 41.2

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>421</td>
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<tr>
<td>557.xz_r</td>
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<td>539</td>
<td>24.0</td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 40.1
SPECrate2017_int_peak = 41.2

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 i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
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.
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) ...
SPEC CPU2017 Integer Rate Result

Huawei

Huawei 2288 V5 (Intel Xeon Bronze 3204)

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CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Mar-2019
Tested by: Huawei
Hardware Availability: Apr-2019
Software Availability: Dec-2018

General Notes (Continued)

is mitigated in the system as tested and documented.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

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 linux-0o4j Wed Mar 27 08:10:38 2019

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) Bronze 3204 CPU @ 1.90GHz
                    2 "physical id"s (chips)
                    12 "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 : 6
    siblings : 6
    physical 0: cores 0 1 2 3 4 5
    physical 1: cores 0 1 2 3 4 5

From lscpu:
    Architecture: x86_64
    CPU op-mode(s): 32-bit, 64-bit
    Byte Order: Little Endian
    CPU(s): 12
    On-line CPU(s) list: 0-11
    Thread(s) per core: 1
    Core(s) per socket: 6
    Socket(s): 2
    NUMA node(s): 2
    Vendor ID: GenuineIntel
    CPU family: 6
    Model: 85
    Model name: Intel(R) Xeon(R) Bronze 3204 CPU @ 1.90GHz
    Stepping: 6
    CPU MHz: 1900.000
    CPU max MHz: 1900.000

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Huawei

Huawei 2288 V5 (Intel Xeon Bronze 3204)

SPECrate2017_int_base = 40.1

SPECrate2017_int_peak = 41.2

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

Test Date: Mar-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Platform Notes (Continued)

CPU min MHz: 800.0000
BogoMIPS: 3800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0-5
NUMA node1 CPU(s): 6-11
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 aes xsave avx
f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single ssbd
mqa ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1
hle avx2 smep bmi2 erms invpcid rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw
avx512vl xsaveopt xsavec x山庄 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
dterm arat pln pts pkp ospke avx512_vnni flush_lid arch_capabilities

/connection/cpuinfo cache data
  cache size : 8448 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
  node 0 size: 95167 MB
  node 0 free: 94710 MB
  node 1 cpus: 6 7 8 9 10 11
  node 1 size: 96501 MB
  node 1 free: 96004 MB
  node distances:
  node 0 1
  0: 10 21
  1: 21 10

From /proc/meminfo
  MemTotal: 196268808 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12

(Continued on next page)
Huawei

Huawei 2288 V5 (Intel Xeon Bronze 3204)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECRate2017_int_base = 40.1
SPECRate2017_int_peak = 41.2

Huawei

CPU2017 License: 3175
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Tested by: Huawei

Test Date: Mar-2019
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Platform Notes (Continued)

PATCHLEVEL = 4
# 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-SP4"
  VERSION_ID="12.4"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 27 08:10

SPEC is set to: /spec2017
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda2 xfs 919G 11G 909G 2% /

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. 6.52 03/16/2019
  Memory:
    4x NO DIMM NO DIMM
    12x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933, configured at 2133

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version
  19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
      525.x264_r(base, peak) 557.xz_r(base, peak)

(Continued on next page)
<table>
<thead>
<tr>
<th></th>
<th>Huawei 2288 V5 (Intel Xeon Bronze 3204)</th>
<th>Huawei 2288 V5 (Intel Xeon Bronze 3204)</th>
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<tr>
<td>CPU2017 License:</td>
<td>3175</td>
<td>Test Date:</td>
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<tr>
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<td>Huawei</td>
<td>Dec-2018</td>
</tr>
</tbody>
</table>

**Compiler Version Notes (Continued)**

```
- Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Cc  500.perlbench_r(peak)

- Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CXXC 523.xalancbmk_r(peak)

- Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.1.144 Build 20181018
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CXXC 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)

- Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC  548.exchange2_r(base, peak)

- Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

**Base Compiler Invocation**

C benchmarks:
```bash
icc -m64 -std=c11
```

C++ benchmarks:
```bash
icpc -m64
```
SPEC CPU2017 Integer Rate Result

Huawei
Huawei 2288 V5 (Intel Xeon Bronze 3204)

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CPU2017 License: 3175
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Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

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

Base Optimization Flags

C benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc
## Huawei 2288 V5 (Intel Xeon Bronze 3204)

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### CPU2017 License: 3175

- **Test Sponsor:** Huawei
- **Tested by:** Huawei
- **Test Date:** Mar-2019
- **Hardware Availability:** Apr-2019
- **Software Availability:** Dec-2018

### Peak Compiler Invocation

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

C++ benchmarks:
- `icpc -m64`

Fortran benchmarks:
- `ifort -m64`

### 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`: `-DSPEC_LP64` `-DSPEC_LINUX`
- `525.x264_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-AVX512` `-O3` `-no-prec-div` `-qopt-mem-layout-trans=4` `-fno-strict-overflow` `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64` `-lqkmalloc`
- `502.gcc_r`: `-Wl,-z,muldefs` `-prof-gen(pass 1)` `-prof-use(pass 2)` `-ipo` `-xCORE-AVX512` `-O3` `-no-prec-div` `-qopt-mem-layout-trans=4` `-L/usr/local/je5.0.1-32/lib` `-ljemalloc`

(Continued on next page)
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CPU2017 License: 3175
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Peak Optimization Flags (Continued)

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: basepeak = yes
523.xalancbmk_r: basepeak = yes

531.deepsjeng_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

541.leela_r: Same as 531.deepsjeng_r

Fortran benchmarks:

-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

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

You can also download the XML flags sources by saving the following links:
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 2019-03-26 20:10:37-0400.