Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8168)

SPECrate2017_int_base = 255
SPECrate2017_int_peak = 275

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

Copies

<table>
<thead>
<tr>
<th>Specbench</th>
<th>Copies</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench</td>
<td>96</td>
</tr>
<tr>
<td>gcc</td>
<td>96</td>
</tr>
<tr>
<td>mcf</td>
<td>96</td>
</tr>
<tr>
<td>omnetpp</td>
<td>96</td>
</tr>
<tr>
<td>xalancbmk</td>
<td>96</td>
</tr>
<tr>
<td>x264</td>
<td>96</td>
</tr>
<tr>
<td>deepsjeng</td>
<td>96</td>
</tr>
<tr>
<td>leela</td>
<td>96</td>
</tr>
<tr>
<td>exchange2</td>
<td>96</td>
</tr>
<tr>
<td>xz</td>
<td>96</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Platinum 8168
Max MHz.: 3700
Nominal: 2700
Enabled: 48 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: 33 MB I+D on chip per chip
Orderable: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 1 x 1200 GB SAS, 10000 RPM
Other: None

Software

OS: Red Hat Enterprise Linux Server release 7.3 (Maipo) 3.10.0-514.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: No
Firmware: Version 0.31 Released Sep-2017
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
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>96</td>
<td>733</td>
<td>209</td>
<td>734</td>
<td>208</td>
<td>742</td>
<td>206</td>
<td>96</td>
<td>591</td>
<td>259</td>
<td>589</td>
<td>259</td>
<td>587</td>
<td>260</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>96</td>
<td>690</td>
<td>197</td>
<td>665</td>
<td>204</td>
<td>715</td>
<td>190</td>
<td>96</td>
<td>509</td>
<td>267</td>
<td>527</td>
<td>258</td>
<td>536</td>
<td>254</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>96</td>
<td>527</td>
<td>295</td>
<td>514</td>
<td>302</td>
<td>536</td>
<td>290</td>
<td>96</td>
<td>527</td>
<td>295</td>
<td>514</td>
<td>302</td>
<td>536</td>
<td>290</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>96</td>
<td>788</td>
<td>160</td>
<td>786</td>
<td>160</td>
<td>787</td>
<td>160</td>
<td>96</td>
<td>788</td>
<td>160</td>
<td>786</td>
<td>160</td>
<td>787</td>
<td>160</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>96</td>
<td>445</td>
<td>228</td>
<td>444</td>
<td>228</td>
<td>446</td>
<td>227</td>
<td>96</td>
<td>350</td>
<td>289</td>
<td>350</td>
<td>289</td>
<td>350</td>
<td>290</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>96</td>
<td>294</td>
<td>571</td>
<td>295</td>
<td>570</td>
<td>294</td>
<td>571</td>
<td>96</td>
<td>281</td>
<td>599</td>
<td>282</td>
<td>595</td>
<td>282</td>
<td>595</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>96</td>
<td>459</td>
<td>240</td>
<td>457</td>
<td>241</td>
<td>456</td>
<td>241</td>
<td>96</td>
<td>456</td>
<td>241</td>
<td>457</td>
<td>241</td>
<td>456</td>
<td>241</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>96</td>
<td>700</td>
<td>227</td>
<td>708</td>
<td>225</td>
<td>698</td>
<td>228</td>
<td>96</td>
<td>701</td>
<td>227</td>
<td>694</td>
<td>229</td>
<td>695</td>
<td>229</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>96</td>
<td>475</td>
<td>530</td>
<td>473</td>
<td>532</td>
<td>474</td>
<td>531</td>
<td>96</td>
<td>474</td>
<td>531</td>
<td>474</td>
<td>531</td>
<td>475</td>
<td>530</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>96</td>
<td>660</td>
<td>157</td>
<td>573</td>
<td>181</td>
<td>658</td>
<td>158</td>
<td>96</td>
<td>660</td>
<td>157</td>
<td>573</td>
<td>181</td>
<td>658</td>
<td>158</td>
</tr>
</tbody>
</table>

SPECrater2017_int_base = 255
SPECrater2017_int_peak = 275

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;

(Continued on next page)
Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8168)

SPECrate2017_int_base = 255
SPECrate2017_int_peak = 275

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

General Notes (Continued)


No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
No: 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.
No: 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.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

Platform Notes

BIOS configuration:
Power Policy Set to Performance
SNC Set to Enabled
IMC Interleaving Set to 1 way Interleave
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Tue Jan 16 20:23:33 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) Platinum 8168 CPU @ 2.70GHz
          2 "physical id"s (chips)
          96 "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 : 24

(Continued on next page)
Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8168)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECrates2017_int_base = 255
SPECrates2017_int_peak = 275

Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8168)

Software Availability: Sep-2017

CPU2017 License: 3175
Test Date: Jan-2018

Test Sponsor: Huawei
Hardware Availability: Jul-2017

Tested by: Huawei
Software Availability: Sep-2017

Platform Notes (Continued)

siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8168 CPU @ 2.70GHz
Stepping: 4
CPU MHz: 2700.000
BogoMIPS: 5405.10
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 33792K
NUMA node0 CPU(s): 0-2, 6-8, 12-14, 18-20, 48-50, 54-56, 60-62, 66-68
NUMA node1 CPU(s): 3-5, 9-11, 15-17, 21-23, 51-53, 57-59, 63-65, 69-71
NUMA node2 CPU(s): 24-26, 30-32, 36-38, 42-44, 72-74, 78-80, 84-86, 90-92
NUMA node3 CPU(s): 27-29, 33-35, 39-41, 45-47, 75-77, 81-83, 87-89, 93-95

/proc/cpuinfo cache data
  cache size : 33792 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 6 7 8 12 13 14 18 19 20 48 49 50 54 55 56 60 61 62 66 68
  node 0 size: 96405 MB
  node 0 free: 93820 MB
  node 1 cpus: 3 4 5 9 10 11 15 16 17 21 22 23 51 52 53 57 58 59 63 64 65 69 70 71
  node 1 size: 98304 MB
  node 1 free: 95383 MB
  node 2 cpus: 24 25 26 30 31 32 36 37 38 42 43 44 72 73 74 78 79 80 84 85 86 90 91 92
  node 2 size: 98304 MB
  node 2 free: 94671 MB
  node 3 cpus: 27 28 29 33 34 35 39 40 41 45 46 47 75 76 77 81 82 83 87 88 89 93 94 95

(Continued on next page)
Huawei 1288H V5 (Intel Xeon Platinum 8168)

SPECfrac2017_int_base = 255
SPECfrac2017_int_peak = 275

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

Platform Notes (Continued)

node 3 size: 98304 MB
node 3 free: 95444 MB
node distances:
node 0 1 2 3
0: 10 11 21 21
1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 394144696 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 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 16 10:49

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 781G 229G 553G 30% /

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. 0.31 09/29/2017
Memory:
24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)
Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8168)

SPECrate2017_int_base = 255
SPECrate2017_int_peak = 275

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

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.
------------------------------------------------------------------------------

==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
    541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
    541.leela_r(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
FC  548.exchange2_r(base, peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

(Continued on next page)
Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8168)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8168)

SPECrate2017_int_base = 255

SPECrate2017_int_peak = 275

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

Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort

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:
-Wl,-z,muldefs -xCORE-AVX512 -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-AVX512 -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-AVX512 -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

(Continued on next page)
Huawei
Huawei 1288H V5 (Intel Xeon Platinum 8168)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base = 255</th>
<th>SPECrate2017_int_peak = 275</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License: 3175</td>
<td>Test Date: Jan-2018</td>
</tr>
<tr>
<td>Test Sponsor: Huawei</td>
<td>Hardware Availability: Jul-2017</td>
</tr>
<tr>
<td>Tested by: Huawei</td>
<td>Software Availability: Sep-2017</td>
</tr>
</tbody>
</table>

**Base Other Flags (Continued)**

Fortran benchmarks:
- m64

**Peak Compiler Invocation**

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

**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-AVX512 -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-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-32/lib -ljemalloc

(Continued on next page)
Peak Optimization Flags (Continued)

505.mcf_r: basepeak = yes

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -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


531.deepsjeng_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

541.leela_r: Same as 531.deepsjeng_r

Fortran benchmarks:

-CORE-AVX512 -ipo -O3 -no-prec-div

-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

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
## SPEC CPU2017 Integer Rate Result

### Huawei

**Huawei 1288H V5 (Intel Xeon Platinum 8168)**

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>255</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>275</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3175

**Test Sponsor:** Huawei

**Tested by:** Huawei

**Test Date:** Jan-2018

**Hardware Availability:** Jul-2017

**Software Availability:** Sep-2017

The flags files that were used to format this result can be browsed at:
- [Intel-ic18.0-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html)
- [Huawei-Platform-Settings-SKL-V1.7.html](http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.html)

You can also download the XML flags sources by saving the following links:
- [Intel-ic18.0-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml)
- [Huawei-Platform-Settings-SKL-V1.7.xml](http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml)

---

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.


Originally published on 2018-02-27.