SPEC® CPU2017 Integer Rate Result

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Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8153)

$$SPECrate2017\_int\_base = 142$$

$$SPECrate2017\_int\_peak = 152$$
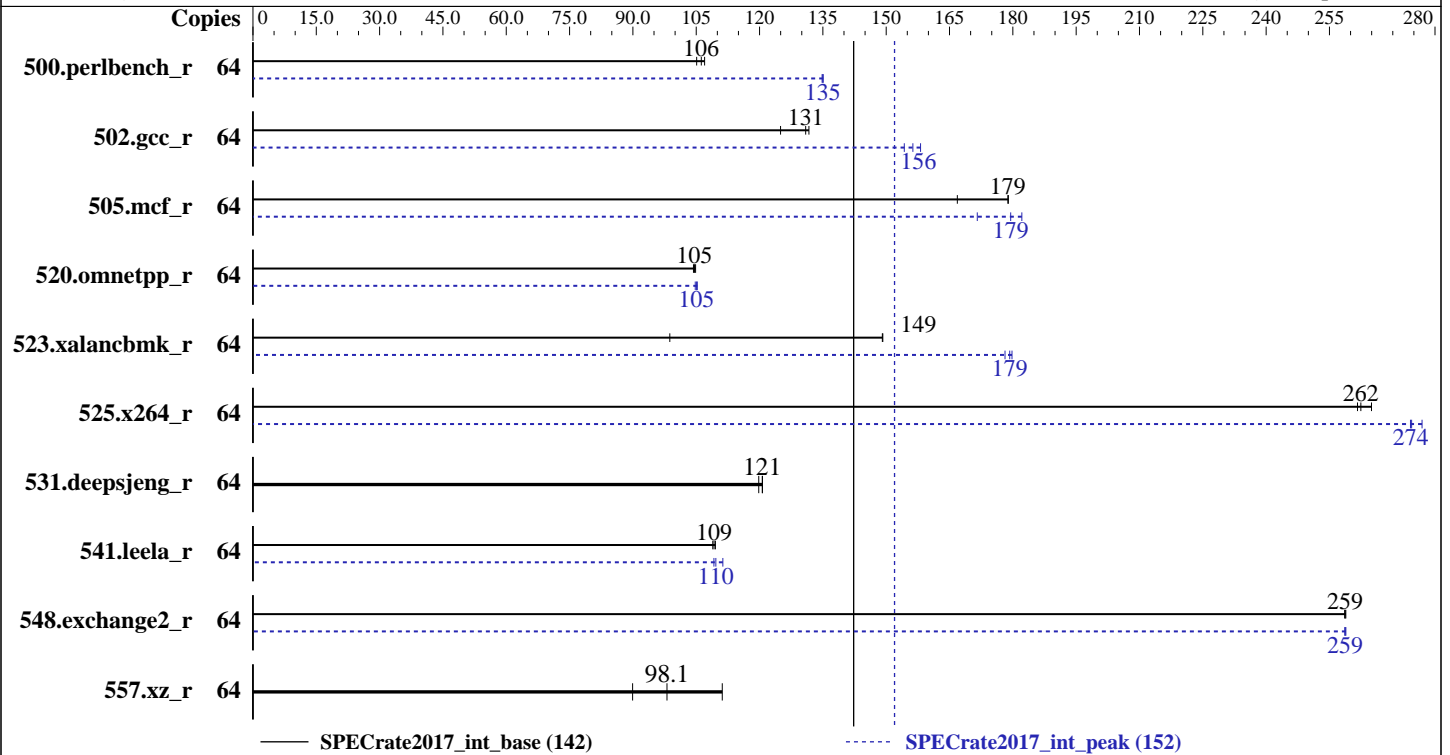
CPU2017 License: 3175

Test Sponsor: Huawei

Tested by: Huawei

Test Date: Jan-2018

Hardware Availability: Jul-2017

Software Availability: Sep-2017

Copies		
500.perlbench_r	64	106 / 135
502.gcc_r	64	131 / 156
505.mcf_r	64	179 / 179
520.omnetpp_r	64	105 / 105
523.xalancbmk_r	64	149 / 179
525.x264_r	64	262 / 274
531.deepsjeng_r	64	121
541.leela_r	64	109 / 110
548.exchange2_r	64	259 / 259
557.xz_r	64	98.1

SPECrate2017_int_base (142) ——— SPECrate2017_int_peak (152) -----

Hardware

CPU Name: Intel Xeon Platinum 8153

 Max MHz.: 2800

 Nominal: 2000

Enabled: 32 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: 22 MB I+D on chip per chip

 Other: 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: ext4

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

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Results Table

Benchmark	Copies	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Peak Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	64	**959**	**106**	969	105	952	107	64	754	135	756	135	**755**	**135**
502.gcc_r	64	688	132	725	125	**692**	**131**	64	573	158	**580**	**156**	587	154
505.mcf_r	64	**578**	**179**	620	167	578	179	64	**576**	**179**	603	172	568	182
520.omnetpp_r	64	**803**	**105**	805	104	801	105	64	798	105	801	105	**799**	**105**
523.xalancbmk_r	64	453	149	684	98.7	**453**	**149**	64	**377**	**179**	376	180	379	178
525.x264_r	64	423	265	428	262	**427**	**262**	64	409	274	**408**	**274**	405	277
531.deepsjeng_r	64	**608**	**121**	612	120	608	121	64	**608**	**121**	612	120	608	121
541.leela_r	64	973	109	968	110	**970**	**109**	64	952	111	**967**	**110**	971	109
548.exchange2_r	64	648	259	**648**	**259**	648	259	64	648	259	**648**	**259**	648	259
557.xz_r	64	**705**	**98.1**	769	89.9	622	111	64	**705**	**98.1**	769	89.9	622	111
SPECrate2017_int_base =	142													
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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 = "/spec2017/lib/ia32:/spec2017/lib/intel64:/spec2017/je5.0.1-32:/spec2017/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>

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)

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General Notes (Continued)

```
jemalloc: sources avilable from jemalloc.net or
https://github.com/jemalloc/jemalloc/releases

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 Wed Jan 17 13:11:47 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 8153 CPU @ 2.00GHz
      2  "physical id"s (chips)
      64 "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 : 16
```

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Platform Notes (Continued)

```
        siblings  : 32
        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):                64
        On-line CPU(s) list:   0-63
        Thread(s) per core:    2
        Core(s) per socket:    16
        Socket(s):             2
        NUMA node(s):          4
        Vendor ID:             GenuineIntel
        CPU family:            6
        Model:                 85
        Model name:            Intel(R) Xeon(R) Platinum 8153 CPU @ 2.00GHz
        Stepping:              4
        CPU MHz:               2000.000
        BogoMIPS:              4004.61
        Virtualization:        VT-x
        L1d cache:             32K
        L1i cache:             32K
        L2 cache:              1024K
        L3 cache:              22528K
        NUMA node0 CPU(s):     0-3,8-11,32-35,40-43
        NUMA node1 CPU(s):     4-7,12-15,36-39,44-47
        NUMA node2 CPU(s):     16-19,24-27,48-51,56-59
        NUMA node3 CPU(s):     20-23,28-31,52-55,60-63

  /proc/cpuinfo cache data
     cache size : 22528 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 3 8 9 10 11 32 33 34 35 40 41 42 43
    node 0 size: 96405 MB
    node 0 free: 93325 MB
    node 1 cpus: 4 5 6 7 12 13 14 15 36 37 38 39 44 45 46 47
    node 1 size: 98304 MB
    node 1 free: 95517 MB
    node 2 cpus: 16 17 18 19 24 25 26 27 48 49 50 51 56 57 58 59
    node 2 size: 98304 MB
    node 2 free: 95216 MB
    node 3 cpus: 20 21 22 23 28 29 30 31 52 53 54 55 60 61 62 63
```

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Platform Notes (Continued)

```
   node 3 size: 98304 MB
   node 3 free: 95616 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:       394144364 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)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

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 17 01:55

SPEC is set to: /spec2017
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext4  689G   26G  629G   4% /

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)
```

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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

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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
```

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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`

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Peak Optimization Flags (Continued)

505.mcf_r: `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

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: `-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`

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

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `Same as 520.omnetpp_r`

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`

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`

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Peak Other Flags (Continued)

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
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:

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml

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

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