SPEC® CPU2017 Integer Rate Result

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Cisco Systems

Cisco UCS B480 M5 (Intel Xeon Gold 6134 3.20 GHz)

SPECrate2017_int_base = 214

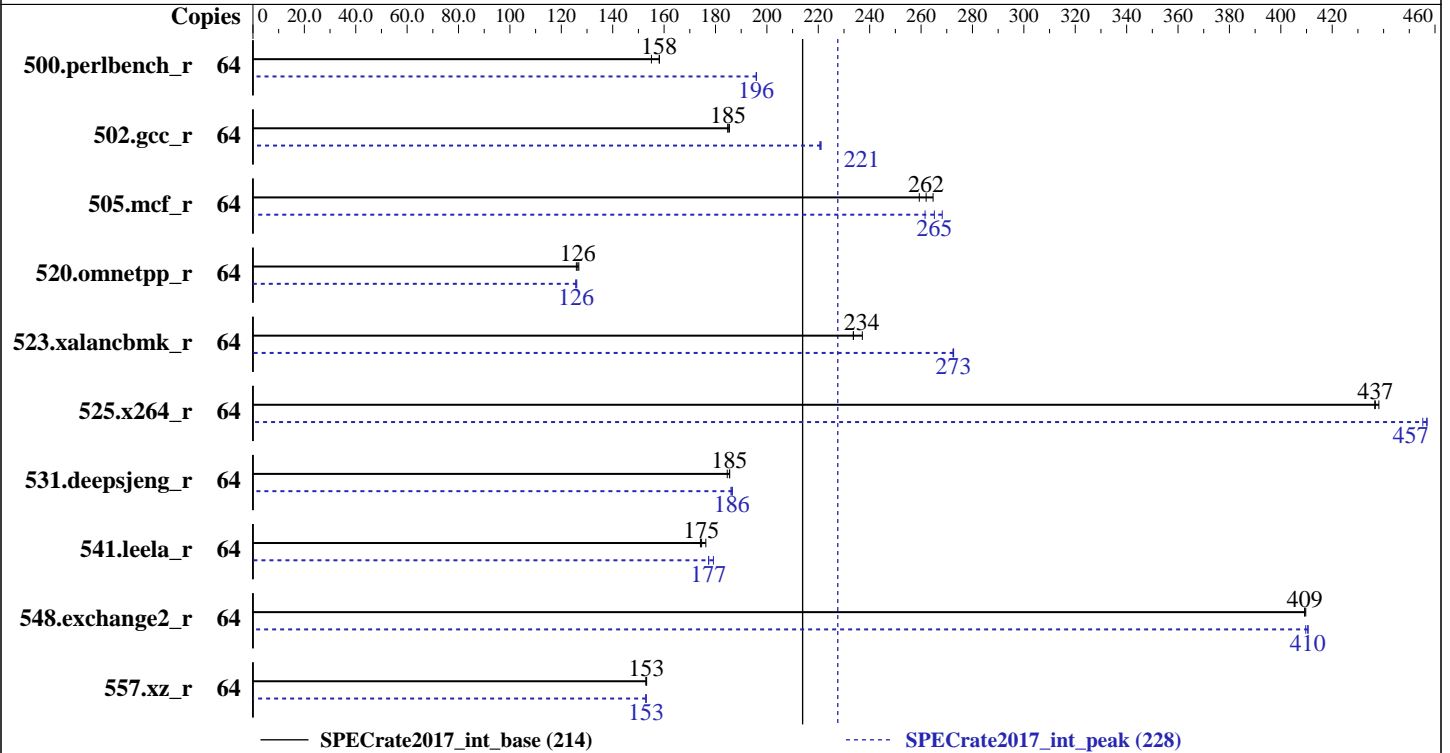SPECrate2017_int_peak = 228

CPU2017 License: 9019

Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Oct-2018

Hardware Availability: Aug-2017

Software Availability: Mar-2018

Copies		
500.perlbench_r	64	158 / 196
502.gcc_r	64	185 / 221
505.mcf_r	64	262 / 265
520.omnetpp_r	64	126 / 126
523.xalancbmk_r	64	234 / 273
525.x264_r	64	437 / 457
531.deepsjeng_r	64	185 / 186
541.leela_r	64	175 / 177
548.exchange2_r	64	409 / 410
557.xz_r	64	153 / 153

——— SPECrate2017_int_base (214)   ------- **SPECrate2017_int_peak (228)**

Hardware

CPU Name: Intel Xeon Gold 6134

 Max MHz.: 3700

 Nominal: 3200

Enabled: 32 cores, 4 chips, 2 threads/core

Orderable: 2,4 Chips

Cache L1: 32 KB I + 32 KB D on chip per core

 L2: 1 MB I+D on chip per core

 L3: 24.75 MB I+D on chip per chip

 Other: None

Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)

Storage: 1 x 400 GB SSD SAS

Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP2 (x86_64)
 4.4.103-92.56-default

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 3.2.3c 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;

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	64	644	158	657	155	**645**	**158**	64	520	196	520	196	**520**	**196**
502.gcc_r	64	**490**	**185**	490	185	489	185	64	**410**	**221**	410	221	411	221
505.mcf_r	64	399	259	**395**	**262**	391	265	64	395	262	386	268	**390**	**265**
520.omnetpp_r	64	662	127	**664**	**126**	667	126	64	666	126	668	126	**668**	**126**
523.xalancbmk_r	64	285	237	289	234	**289**	**234**	64	248	273	248	272	**248**	**273**
525.x264_r	64	257	437	**257**	**437**	256	438	64	**245**	**457**	245	457	246	455
531.deepsjeng_r	64	397	185	395	186	**396**	**185**	64	394	186	393	187	**394**	**186**
541.leela_r	64	601	176	609	174	**607**	**175**	64	598	177	**598**	**177**	591	179
548.exchange2_r	64	**410**	**409**	409	410	410	409	64	409	410	**409**	**410**	408	411
557.xz_r	64	451	153	452	153	**451**	**153**	64	452	153	452	153	**452**	**153**
SPECrate2017_int_base =		**214**												
SPECrate2017_int_peak =		**228**												

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 = "/opt/cpu2017/lib/ia32:/opt/cpu2017/lib/intel64:/opt/cpu2017/je5.0.1-32:/opt/cpu2017/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.
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)

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General Notes (Continued)

is mitigated in the system as tested and documented.

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
https://github.com/jemalloc/jemalloc/releases

Platform Notes

```
BIOS Settings:
Intel HyperThreading Technology set to Enabled
CPU performance set to Enterprise
Power Performance Tuning set to OS Controls
SNC set to Enabled
IMC Interleaving set to 1-way Interleave
Patrol Scrub set to Disabled
 Sysinfo program /opt/cpu2017/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on linux-vb5q Fri Jan  1 16:19:44 2010

 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 6134 CPU @ 3.20GHz
       4  "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 : 8
       siblings  : 16
       physical 0: cores 0 1 2 3 10 11 24 27
       physical 1: cores 1 2 3 4 8 18 24 27
       physical 2: cores 0 2 3 9 16 19 26 27
       physical 3: cores 0 2 3 9 16 19 26 27

 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
```

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Platform Notes (Continued)

```
      Core(s) per socket:      8
      Socket(s):               4
      NUMA node(s):            8
      Vendor ID:              GenuineIntel
      CPU family:              6
      Model:                   85
      Model name:             Intel(R) Xeon(R) Gold 6134 CPU @ 3.20GHz
      Stepping:                4
      CPU MHz:                 1200.218
      CPU max MHz:             3700.0000
      CPU min MHz:             1200.0000
      BogoMIPS:                6399.97
      Virtualization:          VT-x
      L1d cache:               32K
      L1i cache:               32K
      L2 cache:                1024K
      L3 cache:                25344K
      NUMA node0 CPU(s):       0-2,6,32-34,38
      NUMA node1 CPU(s):       3-5,7,35-37,39
      NUMA node2 CPU(s):       8,9,12,14,40,41,44,46
      NUMA node3 CPU(s):       10,11,13,15,42,43,45,47
      NUMA node4 CPU(s):       16,17,19,20,48,49,51,52
      NUMA node5 CPU(s):       18,21-23,50,53-55
      NUMA node6 CPU(s):       24,25,27,28,56,57,59,60
      NUMA node7 CPU(s):       26,29-31,58,61-63
      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
   aperfmperf 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 spec_ctrl kaiser tpr_shadow
   vnmi 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

 /proc/cpuinfo cache data
    cache size : 25344 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 6 32 33 34 38
    node 0 size: 191934 MB
    node 0 free: 189944 MB
    node 1 cpus: 3 4 5 7 35 36 37 39
    node 1 size: 193528 MB
```

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Platform Notes (Continued)

```
    node 1 free: 191699 MB
    node 2 cpus: 8 9 12 14 40 41 44 46
    node 2 size: 193528 MB
    node 2 free: 191702 MB
    node 3 cpus: 10 11 13 15 42 43 45 47
    node 3 size: 193528 MB
    node 3 free: 191701 MB
    node 4 cpus: 16 17 19 20 48 49 51 52
    node 4 size: 193528 MB
    node 4 free: 191694 MB
    node 5 cpus: 18 21 22 23 50 53 54 55
    node 5 size: 193528 MB
    node 5 free: 191702 MB
    node 6 cpus: 24 25 27 28 56 57 59 60
    node 6 size: 193528 MB
    node 6 free: 191690 MB
    node 7 cpus: 26 29 30 31 58 61 62 63
    node 7 size: 193525 MB
    node 7 free: 191694 MB
    node distances:
    node   0   1   2   3   4   5   6   7
      0:  10  11  21  21  21  21  21  21
      1:  11  10  21  21  21  21  21  21
      2:  21  21  10  11  21  21  21  21
      3:  21  21  11  10  21  21  21  21
      4:  21  21  21  21  10  11  21  21
      5:  21  21  21  21  11  10  21  21
      6:  21  21  21  21  21  21  10  11
      7:  21  21  21  21  21  21  11  10

  From /proc/meminfo
    MemTotal:       1583750216 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

  From /etc/*release* /etc/*version*
    SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 2
      # 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-SP2"
      VERSION_ID="12.2"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
```

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Platform Notes (Continued)

```
        ID="sles"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12:sp2"

 uname -a:
    Linux linux-vb5q 4.4.103-92.56-default #1 SMP Wed Dec 27 16:24:31 UTC 2017 (2fd2155)
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Jan 1 04:15

 SPEC is set to: /opt/cpu2017
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda1       xfs   280G   89G  191G  32% /

 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 Cisco Systems, Inc. B480M5.3.2.3c.0.0307181316 03/07/2018
   Memory:
    48x 0xCE00 M393A4K40BB2-CTD 32 GB 2 rank 2666

 (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.
------------------------------------------------------------------------------


==============================================================================
 CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
```

(Continued on next page)

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Compiler Version Notes (Continued)

```
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 -m64 -std=c11`

C++ benchmarks:
`icpc -m64`

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`

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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
```

Peak Compiler Invocation

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

```
502.gcc_r: icc -m32 -std=c11 -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
```

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

```
523.xalancbmk_r: icpc -m32 -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
```

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: -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
```

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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: `-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`

 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: `Same as 505.mcf_r`

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: `-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: `Same as 520.omnetpp_r`

 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`

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/Cisco-Platform-Settings-V1.2-revH.html

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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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/Cisco-Platform-Settings-V1.2-revH.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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