SPEC CPU®2017 Integer Rate Result

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Cisco Systems

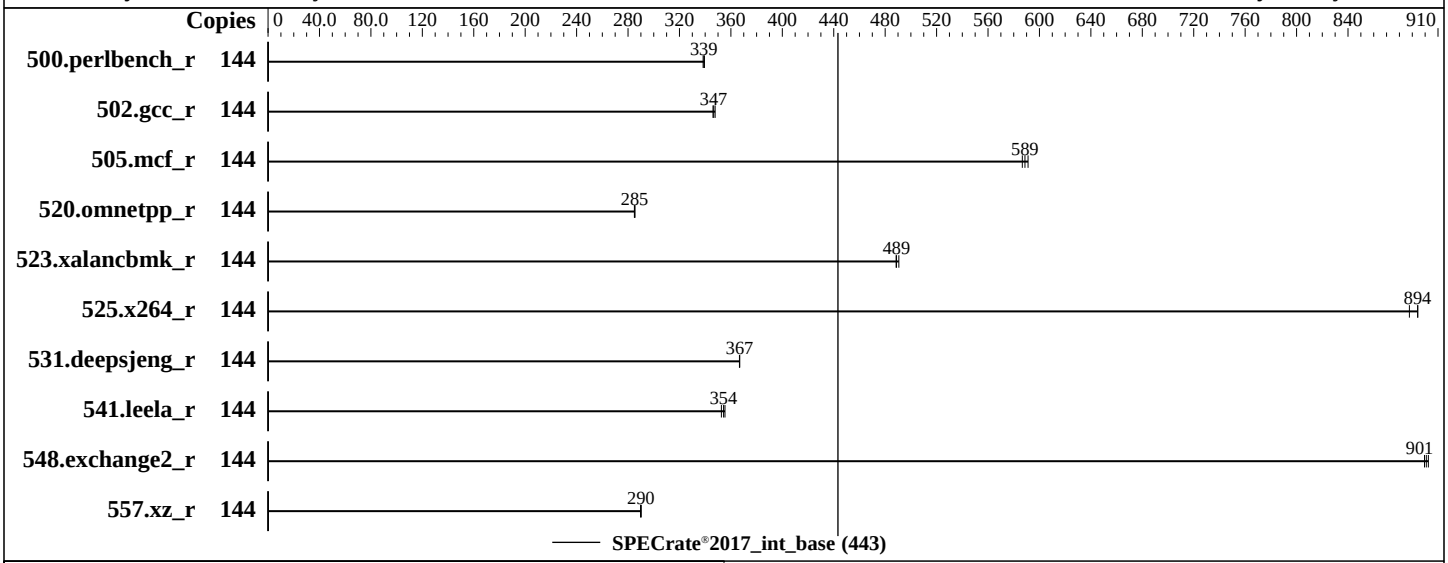
Cisco UCS C480 M5 (Intel Xeon Gold 6240Y, 2.60GHz)

SPECrate®2017_int_base = 443

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems

Test Date: Nov-2019
Hardware Availability: Apr-2019
Software Availability: May-2019



Hardware

CPU Name:	Intel Xeon Gold 6240Y
Max MHz:	3900
Nominal:	2600
Enabled:	72 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 PC4-2933V-R)
Storage:	1 x 1.9 TB SSD SAS
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 (x86_64) 4.12.14-23-default
Compiler:	C/C++: Version 19.0.4.227 of Intel C/C++ Compiler for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler for Linux
Parallel:	No
Firmware:	Version 4.0.3 released Mar-2019
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	None
Power Management:	--

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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	144	**676**	**339**	675	339	677	338							
502.gcc_r	144	**588**	**347**	586	348	589	346							
505.mcf_r	144	397	587	394	591	**395**	**589**							
520.omnetpp_r	144	662	285	**663**	**285**	663	285							
523.xalancbmk_r	144	311	489	**311**	**489**	310	491							
525.x264_r	144	282	894	**282**	**894**	284	888							
531.deepsjeng_r	144	450	367	450	367	**450**	**367**							
541.leela_r	144	671	355	676	353	**673**	**354**							
548.exchange2_r	144	**419**	**901**	418	902	419	900							
557.xz_r	144	536	290	**536**	**290**	537	290							

SPECrate®2017_int_base = 443

SPECrate®2017_int_peak = Not Run

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"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-
     32"
```

General Notes

```
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.:
```

(Continued on next page)

General Notes (Continued)

```
 numactl --interleave=all runcpu <etc>
NA: 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 Settings:
Intel HyperThreading Technology set to Enabled
SNC set to Enabled
IMC Interleaving set to 1-way Interleave
Patrol Scrub set to Disabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on linux-9yc8 Wed Nov 20 17:28:34 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) Gold 6240C CPU @ 2.60GHz
       4  "physical id"s (chips)
       144 "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 : 18
       siblings  : 36
       physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
       physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
       physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
       physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

 From lscpu:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
      CPU(s):              144
      On-line CPU(s) list: 0-143
      Thread(s) per core:  2
      Core(s) per socket:  18
      Socket(s):           4
```

(Continued on next page)

Platform Notes (Continued)

```
      NUMA node(s):          8
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Gold 6240C CPU @ 2.60GHz
      Stepping:              6
      CPU MHz:               2600.000
      CPU max MHz:           3900.0000
      CPU min MHz:           1000.0000
      BogoMIPS:              5200.00
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              25344K
      NUMA node0 CPU(s):     0-2,5,6,9,10,14,15,72-74,77,78,81,82,86,87
      NUMA node1 CPU(s):     3,4,7,8,11-13,16,17,75,76,79,80,83-85,88,89
      NUMA node2 CPU(s):     18-20,23,24,27,28,32,33,90-92,95,96,99,100,104,105
      NUMA node3 CPU(s):     21,22,25,26,29-31,34,35,93,94,97,98,101-103,106,107
      NUMA node4 CPU(s):     36-38,41,42,45,46,50,51,108-110,113,114,117,118,122,123
      NUMA node5 CPU(s):     39,40,43,44,47-49,52,53,111,112,115,116,119-121,124,125
      NUMA node6 CPU(s):     54-56,59,60,63,64,68,69,126-128,131,132,135,136,140,141
      NUMA node7 CPU(s):     57,58,61,62,65-67,70,71,129,130,133,134,137-139,142,143
      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 cpuid
      aperfmperf tsc_known_freq 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 cpuid_fault
      epb cat_l3 cdp_l3 invpcid_single mba tpr_shadow vnmi flexpriority ept vpid fsgsbase
      tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq
      rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec
      xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local ibpb ibrs stibp
      dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni
      arch_capabilities ssbd

  /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 5 6 9 10 14 15 72 73 74 77 78 81 82 86 87
    node 0 size: 192095 MB
    node 0 free: 191807 MB
    node 1 cpus: 3 4 7 8 11 12 13 16 17 75 76 79 80 83 84 85 88 89
    node 1 size: 193527 MB
```

(Continued on next page)

Platform Notes (Continued)

```
   node 1 free: 193147 MB
   node 2 cpus: 18 19 20 23 24 27 28 32 33 90 91 92 95 96 99 100 104 105
   node 2 size: 193527 MB
   node 2 free: 193318 MB
   node 3 cpus: 21 22 25 26 29 30 31 34 35 93 94 97 98 101 102 103 106 107
   node 3 size: 193527 MB
   node 3 free: 193342 MB
   node 4 cpus: 36 37 38 41 42 45 46 50 51 108 109 110 113 114 117 118 122 123
   node 4 size: 193527 MB
   node 4 free: 193344 MB
   node 5 cpus: 39 40 43 44 47 48 49 52 53 111 112 115 116 119 120 121 124 125
   node 5 size: 193498 MB
   node 5 free: 193316 MB
   node 6 cpus: 54 55 56 59 60 63 64 68 69 126 127 128 131 132 135 136 140 141
   node 6 size: 193527 MB
   node 6 free: 193307 MB
   node 7 cpus: 57 58 61 62 65 66 67 70 71 129 130 133 134 137 138 139 142 143
   node 7 size: 193524 MB
   node 7 free: 193307 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:       1583877296 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 From /etc/*release* /etc/*version*
    os-release:
       NAME="SLES"
       VERSION="15"
       VERSION_ID="15"
       PRETTY_NAME="SUSE Linux Enterprise Server 15"
       ID="sles"
       ID_LIKE="suse"
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/o:suse:sles:15"

 uname -a:
```

(Continued on next page)

Platform Notes (Continued)

```
    Linux linux-9yc8 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
    x86_64 x86_64 x86_64 GNU/Linux

  Kernel self-reported vulnerability status:

  CVE-2018-3620 (L1 Terminal Fault):        No status reported
  Microarchitectural Data Sampling:         No status reported
  CVE-2017-5754 (Meltdown):                 Not affected
  CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled
                                            via prctl and seccomp
  CVE-2017-5753 (Spectre variant 1):        Mitigation: __user pointer sanitization
  CVE-2017-5715 (Spectre variant 2):        Mitigation: Indirect Branch Restricted
                                            Speculation, IBPB, IBRS_FW

  run-level 3 Nov 19 22:52

  SPEC is set to: /home/cpu2017
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda1      xfs   280G   41G  239G  15% /

  From /sys/devices/virtual/dmi/id
      BIOS:    Cisco Systems, Inc. C480M5.4.0.3.32.0301190121 03/01/2019
      Vendor:  Cisco
      Product: UCSC-C480-M5
      Serial:  FCH2238W00E

  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.
    Memory:
      48x 0xCE00 M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

  (End of data from sysinfo program)
```

The marketing name for the processor in this result, which appears in the CPU name and hardware model areas, is different from sysinfo because a pre-production processor was used. The pre-production processor differs from the production processor in name only.

Compiler Version Notes

```
==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
        | 525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.227 Build 20190416
```

(Continued on next page)

Compiler Version Notes (Continued)

```
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
        | 541.leela_r(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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`

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

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_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.html
http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revJ.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml
http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revJ.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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