SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMEQUEST 3800E2, Intel Xeon Gold 6246, 3.30GHz

$SPECrate®2017\_int\_base =$ **365**

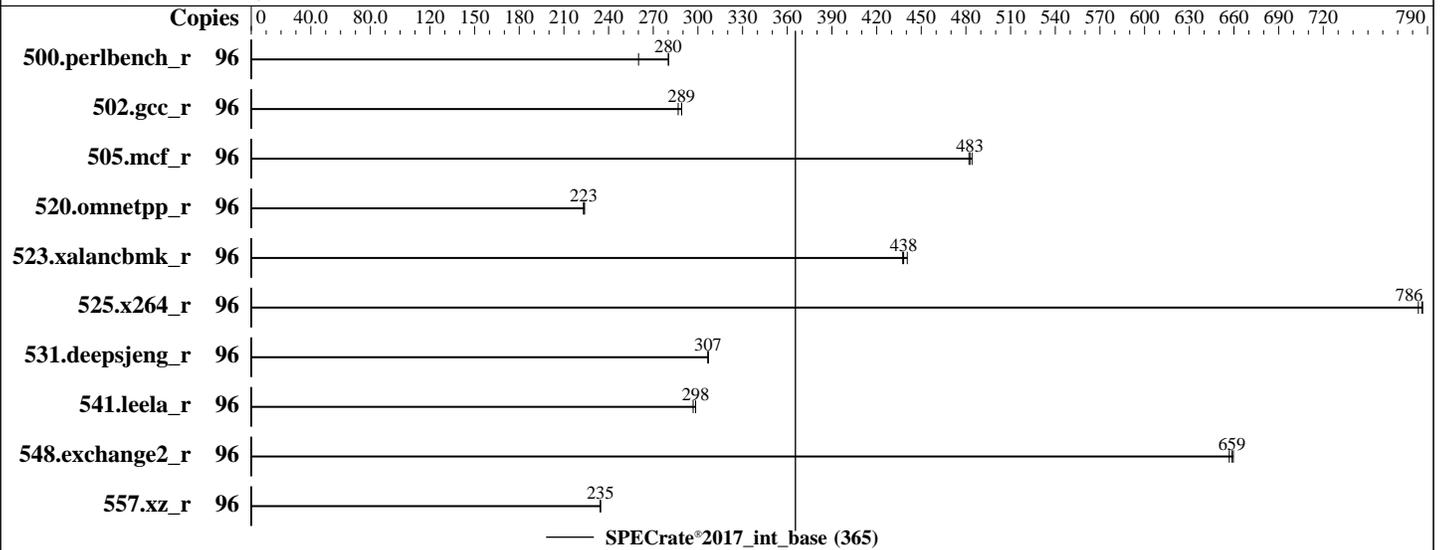$SPECrate®2017\_int\_peak =$ Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

Copies		
500.perlbench_r	96	280
502.gcc_r	96	289
505.mcf_r	96	483
520.omnetpp_r	96	223
523.xalancbmk_r	96	438
525.x264_r	96	786
531.deepsjeng_r	96	307
541.leela_r	96	298
548.exchange2_r	96	659
557.xz_r	96	235

SPECrate®2017_int_base (365)

Hardware

CPU Name: Intel Xeon Gold 6246
 Max MHz: 4200
 Nominal: 3300
Enabled: 48 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 PC4-2933Y-R)
Storage: 1 x SAS HDD, 600GB, 10.5K RPM, SAS HDD
Other: None

Software

OS: SUSE Linux Enterprise Server 15
4.12.14-25.28-default
Compiler: C/C++: Version 19.0.1.144 of Intel C/C++
Compiler for Linux;
Fortran: Version 19.0.1.144 of Intel Fortran
Compiler for Linux
Parallel: No
Firmware: PRIMEQUEST 3800E2 Unified Firmware
Version PB19043, Released Jun-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: --

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Results Table

Benchmark	Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
500.perlbench_r	96	588	260	**546**	**280**	545	280							
502.gcc_r	96	**470**	**289**	470	289	474	287							
505.mcf_r	96	322	482	**321**	**483**	320	484							
520.omnetpp_r	96	**564**	**223**	563	224	564	223							
523.xalancbmk_r	96	230	441	**231**	**438**	232	438							
525.x264_r	96	214	787	**214**	**786**	214	784							
531.deepsjeng_r	96	359	307	**359**	**307**	359	307							
541.leela_r	96	**533**	**298**	536	297	533	298							
548.exchange2_r	96	383	657	**382**	**659**	381	660							
557.xz_r	96	**442**	**235**	442	234	442	235							
SPECrate®2017_int_base =		**365**												
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"
    Kernel Boot Parameter set with : nohz_full=1-95

General Notes

    Environment variables set by runcpu before the start of the run:
    LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-int/lib/intel64"

    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>
    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.

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SPECrate®2017_int_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Jun-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

General Notes (Continued)

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

```
 DCU Streamer Prefetcher = Disabled
 DDR4 Write Data CRC Protection = Disabled
 HWPM Support = Native Mode with no legacy
 Stale AtoS = Enabled
 Sub Numa Clustering = Enabled
 Uncore Frequency Scaling = Disabled
 UPI Link L0p = Disabled
 XPT Prefetch = Enabled
 Fan Control = Full
 Sysinfo program /home/Benchmark/speccpu2017-int/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-8r5c Tue Jun 18 17:56:40 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 6246 CPU @ 3.30GHz
       4  "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 : 12
       siblings  : 24
       physical 0: cores 0 2 4 8 9 10 17 18 19 20 25 27
       physical 1: cores 0 1 2 4 8 9 10 11 17 18 19 27
       physical 2: cores 0 2 4 8 9 10 11 17 18 19 25 27
       physical 3: cores 1 2 3 4 8 10 11 16 17 25 26 27

 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:  12
      Socket(s):           4
      NUMA node(s):        8
      Vendor ID:           GenuineIntel
```

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Platform Notes (Continued)

```
        CPU family:          6
        Model:               85
        Model name:          Intel(R) Xeon(R) Gold 6246 CPU @ 3.30GHz
        Stepping:            7
        CPU MHz:             3300.000
        CPU max MHz:         4200.0000
        CPU min MHz:         1200.0000
        BogoMIPS:            6600.00
        Virtualization:      VT-x
        L1d cache:           32K
        L1i cache:           32K
        L2 cache:            1024K
        L3 cache:            25344K
        NUMA node0 CPU(s):   0,1,3,4,6,10,48,49,51,52,54,58
        NUMA node1 CPU(s):   2,5,7-9,11,50,53,55-57,59
        NUMA node2 CPU(s):   12-14,16,17,20,60-62,64,65,68
        NUMA node3 CPU(s):   15,18,19,21-23,63,66,67,69-71
        NUMA node4 CPU(s):   24,25,27,28,31,34,72,73,75,76,79,82
        NUMA node5 CPU(s):   26,29,30,32,33,35,74,77,78,80,81,83
        NUMA node6 CPU(s):   36,37,40,43-45,84,85,88,91-93
        NUMA node7 CPU(s):   38,39,41,42,46,47,86,87,89,90,94,95
        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 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 intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced 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 dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku
    ospke avx512_vnni flush_l1d arch_capabilities

  /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 3 4 6 10 48 49 51 52 54 58
   node 0 size: 192263 MB
   node 0 free: 191721 MB
   node 1 cpus: 2 5 7 8 9 11 50 53 55 56 57 59
   node 1 size: 193523 MB
   node 1 free: 193334 MB
   node 2 cpus: 12 13 14 16 17 20 60 61 62 64 65 68
```

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Platform Notes (Continued)

```
   node 2 size: 193523 MB
   node 2 free: 193342 MB
   node 3 cpus: 15 18 19 21 22 23 63 66 67 69 70 71
   node 3 size: 193523 MB
   node 3 free: 193346 MB
   node 4 cpus: 24 25 27 28 31 34 72 73 75 76 79 82
   node 4 size: 193523 MB
   node 4 free: 193331 MB
   node 5 cpus: 26 29 30 32 33 35 74 77 78 80 81 83
   node 5 size: 193523 MB
   node 5 free: 193351 MB
   node 6 cpus: 36 37 40 43 44 45 84 85 88 91 92 93
   node 6 size: 193494 MB
   node 6 free: 193317 MB
   node 7 cpus: 38 39 41 42 46 47 86 87 89 90 94 95
   node 7 size: 193320 MB
   node 7 free: 193039 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  11  20  20  20  20  28  28
     1:  11  10  20  20  20  20  28  28
     2:  20  20  10  11  28  28  20  20
     3:  20  20  11  10  28  28  20  20
     4:  20  20  28  28  10  11  20  20
     5:  20  20  28  28  11  10  20  20
     6:  28  28  20  20  20  20  10  11
     7:  28  28  20  20  20  20  11  10

 From /proc/meminfo
   MemTotal:      1583818832 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:
   Linux linux-8r5c 4.12.14-25.28-default #1 SMP Wed Jan 16 20:00:47 UTC 2019 (dd6077c)
   x86_64 x86_64 x86_64 GNU/Linux
```

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Platform Notes (Continued)

```
 Kernel self-reported vulnerability status:

 CVE-2017-5754 (Meltdown):           Not affected
 CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
 CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB
 filling

 run-level 3 Jun 18 17:45

 SPEC is set to: /home/Benchmark/speccpu2017-int
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda3       xfs   142G   35G  107G  25% /home

 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 FUJITSU V1.0.0.0 R1.16.0 for D3858-B1x            04/24/2019
   Memory:
     44x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
     4x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

 (End of data from sysinfo program)
```

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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
```

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Compiler Version Notes (Continued)

```
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------
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:
`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_2019.1.144/linux/compiler/lib/intel64`
`-lqkmalloc`

C++ benchmarks:
`-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
```
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/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_2019.1.144/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-ic18.0-official-linux64.2019-04-02.html
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CSL-RevE.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.xml
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CSL-RevE.xml

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

Tested with SPEC CPU®2017 v1.0.5 on 2019-06-18 04:56:39-0400.
Report generated on 2019-11-12 15:01:12 by CPU2017 PDF formatter v6255.
Originally published on 2019-11-12.