SPEC CPU®2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX4770 M5, Intel Xeon Gold 6246, 3.30GHz

$SPECrate®2017\_int\_base =$ 360

$SPECrate®2017\_int\_peak =$ Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Aug-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

Benchmark	Copies	Result
500.perlbench_r	96	275
502.gcc_r	96	290
505.mcf_r	96	479
520.omnetpp_r	96	218
523.xalancbmk_r	96	440
525.x264_r	96	764
531.deepsjeng_r	96	303
541.leela_r	96	291
548.exchange2_r	96	649
557.xz_r	96	230

—— SPECrate®2017_int_base (360)

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 SATA M.2 SSD, 480 GB
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: Fujitsu BIOS for D3753-C1x
 Version V5.0.0.14 R1.8.0 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/

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX4770 M5, Intel Xeon Gold 6246, 3.30GHz

SPECrate®2017_int_base =   360
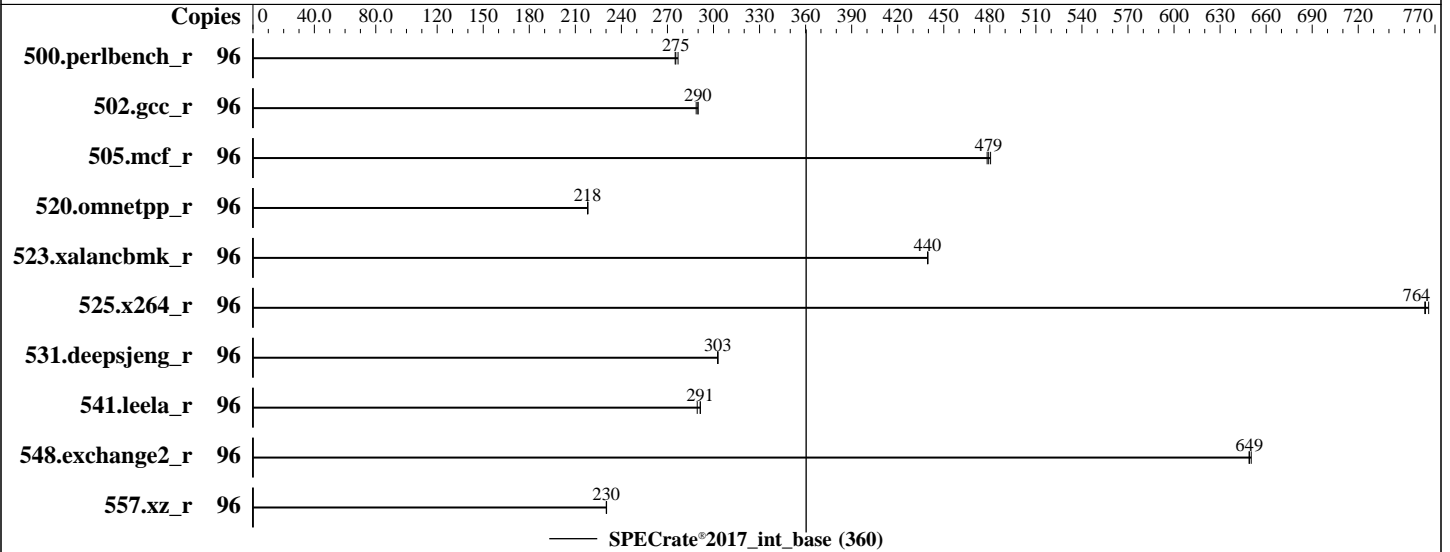
SPECrate®2017_int_peak = Not Run

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

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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	96	556	275	552	277	**555**	**275**							
502.gcc_r	96	469	290	471	289	**469**	**290**							
505.mcf_r	96	324	478	**324**	**479**	323	480							
520.omnetpp_r	96	578	218	**578**	**218**	577	218							
523.xalancbmk_r	96	231	440	231	440	**231**	**440**							
525.x264_r	96	219	766	220	763	**220**	**764**							
531.deepsjeng_r	96	363	303	363	303	**363**	**303**							
541.leela_r	96	545	291	549	289	**546**	**291**							
548.exchange2_r	96	388	649	**387**	**649**	387	650							
557.xz_r	96	450	230	**450**	**230**	450	230							
SPECrate®2017_int_base =		**360**												
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
Process tuning settings:
echo 10000000 > /proc/sys/kernel/sched_min_granularity_ns

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.

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/

Fujitsu

PRIMERGY RX4770 M5, Intel Xeon Gold 6246, 3.30GHz

SPECrate®2017_int_base =   360

SPECrate®2017_int_peak = Not Run

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

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

General Notes (Continued)

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (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 configuration:
DCU Streamer Prefetcher = Disabled
Fan Control = Full
Energy Performance = Performance
HWPM = Native Mode with no legacy
LLC Prefetcher = Disable
Override OS Energy Performance = Enable
Patrol Scrub  = Disabled
WR CRC feature Control = Disabled
XPT Prefetch = Enable
Sysinfo program /home/Benchmark/speccpu2017-int/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on SLES15-BMT Sun Aug  4 00:48:01 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
```

(Continued on next page)

Fujitsu

PRIMERGY RX4770 M5, Intel Xeon Gold 6246, 3.30GHz

SPECrate®2017_int_base = 360

SPECrate®2017_int_peak = Not Run

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

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

Platform Notes (Continued)

```
      Socket(s):              4
      NUMA node(s):           8
      Vendor ID:              GenuineIntel
      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: 191884 MB
    node 0 free: 185778 MB
    node 1 cpus: 2 5 7 8 9 11 50 53 55 56 57 59
```

(Continued on next page)

Fujitsu

PRIMERGY RX4770 M5, Intel Xeon Gold 6246, 3.30GHz

SPECrate®2017_int_base =   360

SPECrate®2017_int_peak = Not Run

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

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

Platform Notes (Continued)

```
   node 1 size: 193533 MB
   node 1 free: 193343 MB
   node 2 cpus: 12 13 14 16 17 20 60 61 62 64 65 68
   node 2 size: 193533 MB
   node 2 free: 193348 MB
   node 3 cpus: 15 18 19 21 22 23 63 66 67 69 70 71
   node 3 size: 193533 MB
   node 3 free: 193363 MB
   node 4 cpus: 24 25 27 28 31 34 72 73 75 76 79 82
   node 4 size: 193533 MB
   node 4 free: 193315 MB
   node 5 cpus: 26 29 30 32 33 35 74 77 78 80 81 83
   node 5 size: 193533 MB
   node 5 free: 192565 MB
   node 6 cpus: 36 37 40 43 44 45 84 85 88 91 92 93
   node 6 size: 193504 MB
   node 6 free: 193322 MB
   node 7 cpus: 38 39 41 42 46 47 86 87 89 90 94 95
   node 7 size: 193361 MB
   node 7 free: 193164 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:       1583531696 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"
```

(Continued on next page)

Fujitsu

PRIMERGY RX4770 M5, Intel Xeon Gold 6246, 3.30GHz

SPECrate®2017_int_base =   360

SPECrate®2017_int_peak = Not Run

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

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

Platform Notes (Continued)

```
uname -a:
   Linux SLES15-BMT 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

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 Aug 4 00:45

SPEC is set to: /home/Benchmark/speccpu2017-int
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda5       xfs   343G   30G  314G   9% /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 // American Megatrends Inc. V5.0.0.14 R1.8.0 for D3753-C1x
        06/06/2019
   Memory:
     48x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933, configured at 2934

(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.
```

(Continued on next page)

SPEC CPU®2017 Integer Rate Result

Fujitsu

PRIMERGY RX4770 M5, Intel Xeon Gold 6246, 3.30GHz

SPECrate®2017_int_base =   360

SPECrate®2017_int_peak = Not Run

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

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

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`

(Continued on next page)

 https://www.spec.org/

Fujitsu
PRIMERGY RX4770 M5, Intel Xeon Gold 6246, 3.30GHz

SPECrate®2017_int_base = 360

SPECrate®2017_int_peak = Not Run

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

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

Base Optimization Flags (Continued)

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
```

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 2019-08-03 11:48:00-0400.
Report generated on 2019-10-01 14:30:53 by CPU2017 PDF formatter v6255.
Originally published on 2019-10-01.