SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

$SPECrate^{®}2017\_int\_base =$ **270**

$SPECrate^{®}2017\_int\_peak =$ Not Run

CPU2017 License: 19	**Test Date:** Jun-2021
Test Sponsor: Fujitsu	**Hardware Availability:** Aug-2021
Tested by: Fujitsu	**Software Availability:** Aug-2020

Copies — scale: 0, 30.0, 60.0, 90.0, 120, 150, 180, 210, 240, 270, 300, 330, 360, 390, 420, 450, 480, 510, 540, 590

Benchmark	Copies	Result
500.perlbench_r	80	180
502.gcc_r	80	218
505.mcf_r	80	440
520.omnetpp_r	80	180
523.xalancbmk_r	80	338
525.x264_r	80	540
531.deepsjeng_r	80	205
541.leela_r	80	200
548.exchange2_r	80	581
557.xz_r	80	151

SPECrate®2017_int_base (270)

Hardware

CPU Name: Intel Xeon Silver 4316
 Max MHz: 3400
 Nominal: 2300
Enabled: 40 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 1.25 MB I+D on chip per core
 L3: 30 MB I+D on chip per chip
 Other: None
Memory: 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R, running at 2666)
Storage: 1 x SATA M.2 SSD, 480GB
Other: None

Software

OS: Red Hat Enterprise Linux release 8.2 (Ootpa)
 4.18.0-193.el8.x86_64
Compiler: C/C++: Version 19.1.2.275 of Intel C/C++ Compiler for Linux;
 Fortran: Version 19.1.2.275 of Intel Fortran Compiler for Linux
Parallel: No
Firmware: Fujitsu BIOS Version V1.0.0.0 R1.6.0 for D3891-A1x. Released Jun-2021
 tested as V1.0.0.0 R1.2.0 for D3891-A1x Apr-2021
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS set to prefer performance at the cost of additional power usage

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

SPECrate®2017_int_base =   270

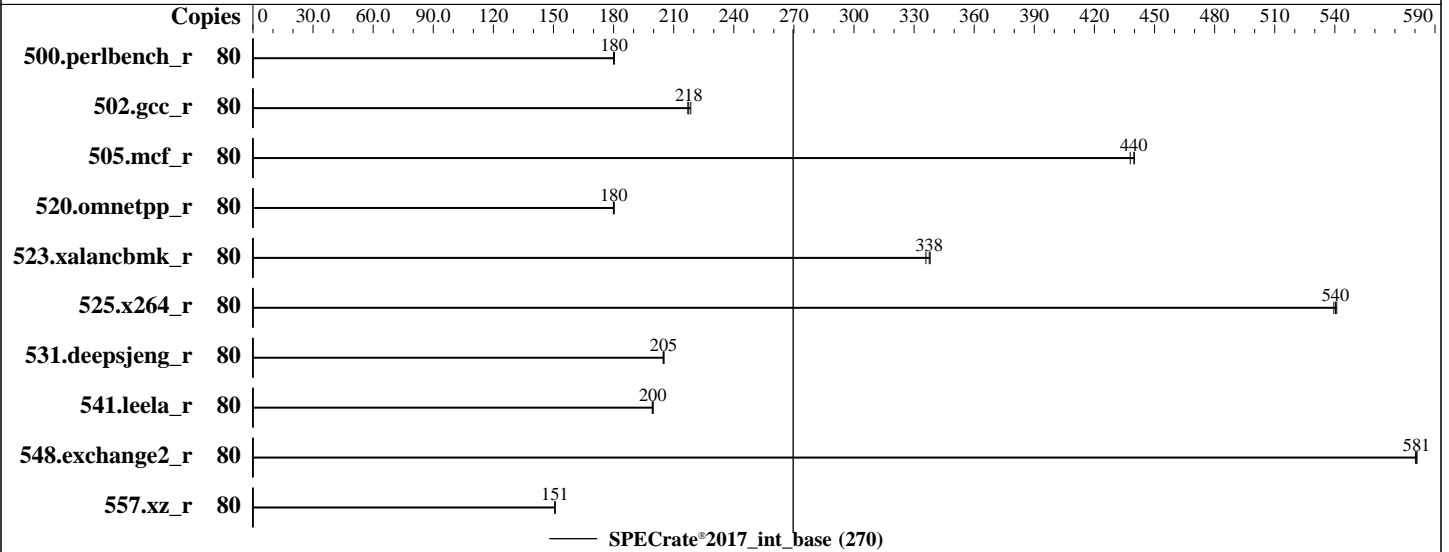SPECrate®2017_int_peak = Not Run

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

Test Date: Jun-2021
Hardware Availability: Aug-2021
Software Availability: Aug-2020

Results Table

Benchmark		Base							Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	80	**706**	**180**	708	180	706	180							
502.gcc_r	80	**521**	**218**	522	217	518	219							
505.mcf_r	80	**294**	**440**	294	440	295	438							
520.omnetpp_r	80	583	180	582	180	**583**	**180**							
523.xalancbmk_r	80	250	338	**250**	**338**	252	336							
525.x264_r	80	259	541	260	539	**259**	**540**							
531.deepsjeng_r	80	447	205	448	205	**447**	**205**							
541.leela_r	80	663	200	**664**	**200**	665	199							
548.exchange2_r	80	**361**	**581**	361	581	361	580							
557.xz_r	80	573	151	**573**	**151**	573	151							
SPECrate®2017_int_base =		**270**												
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 config file option 'submit' was used.
```

Operating System Notes

```
 Stack size set to unlimited using "ulimit -s unlimited"
 Kernel Boot Parameter set with : nohz_full=1-79
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/PVT/speccpu-1.1.8/lib/intel64:/home/PVT/speccpu-1.1.8/lib/ia32:/h
     ome/PVT/speccpu-1.1.8/je5.0.1-32"
MALLOC_CONF = "retain:true"
```

General Notes

```
 Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
 memory using Redhat Enterprise Linux 8.0
 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)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

SPECrate®2017_int_base =   270

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2021

Hardware Availability: Aug-2021

Software Availability: Aug-2020

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 configuration:
DCU Streamer Prefetcher = Disabled
CPU C1E Support = Disabled
Package C State Limit = C2
UPI Link Frequency Select = 10.4 GT/s
XPT Prefetch = Enabled
LLC Prefetch = Enabled
SNC = Enable SNC2
UPI Prefetch = Disabled
FAN Control = Full

Sysinfo program /home/PVT/speccpu-1.1.8/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Wed Jun 16 12:02:03 2021

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) Silver 4316 CPU @ 2.30GHz
      2  "physical id"s (chips)
      80 "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 : 20
      siblings  : 40
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

From lscpu from util-linux 2.32.1:
    Architecture:        x86_64
    CPU op-mode(s):      32-bit, 64-bit
    Byte Order:          Little Endian
    CPU(s):              80
    On-line CPU(s) list: 0-79
```

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

SPECrate®2017_int_base =   270

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2021

Hardware Availability: Aug-2021

Software Availability: Aug-2020

Platform Notes (Continued)

```
       Thread(s) per core:    2
       Core(s) per socket:    20
       Socket(s):             2
       NUMA node(s):          4
       Vendor ID:             GenuineIntel
       CPU family:            6
       Model:                 106
       Model name:            Intel(R) Xeon(R) Silver 4316 CPU @ 2.30GHz
       Stepping:              6
       CPU MHz:               856.956
       CPU max MHz:           3400.0000
       CPU min MHz:           800.0000
       BogoMIPS:              4600.00
       Virtualization:        VT-x
       L1d cache:             48K
       L1i cache:             32K
       L2 cache:              1280K
       L3 cache:              30720K
       NUMA node0 CPU(s):     0-9,40-49
       NUMA node1 CPU(s):     10-19,50-59
       NUMA node2 CPU(s):     20-29,60-69
       NUMA node3 CPU(s):     30-39,70-79
       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 invpcid_single 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 rdt_a avx512f avx512dq
    rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw
    avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
    cqm_mbm_local wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp
    hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
    avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d
    arch_capabilities

 /proc/cpuinfo cache data
    cache size : 30720 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 4 5 6 7 8 9 40 41 42 43 44 45 46 47 48 49
   node 0 size: 257464 MB
   node 0 free: 257063 MB
   node 1 cpus: 10 11 12 13 14 15 16 17 18 19 50 51 52 53 54 55 56 57 58 59
```

(Continued on next page)

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

SPECrate®2017_int_base =   270

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2021

Hardware Availability: Aug-2021

Software Availability: Aug-2020

Platform Notes (Continued)

```
   node 1 size: 258043 MB
   node 1 free: 257803 MB
   node 2 cpus: 20 21 22 23 24 25 26 27 28 29 60 61 62 63 64 65 66 67 68 69
   node 2 size: 258043 MB
   node 2 free: 257374 MB
   node 3 cpus: 30 31 32 33 34 35 36 37 38 39 70 71 72 73 74 75 76 77 78 79
   node 3 size: 258013 MB
   node 3 free: 257750 MB
   node distances:
   node   0   1   2   3
     0:  10  11  20  20
     1:  11  10  20  20
     2:  20  20  10  11
     3:  20  20  11  10

 From /proc/meminfo
    MemTotal:       1056321672 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 /sbin/tuned-adm active
     Current active profile: throughput-performance

 /sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
    performance

 From /etc/*release* /etc/*version*
    os-release:
       NAME="Red Hat Enterprise Linux"
       VERSION="8.2 (Ootpa)"
       ID="rhel"
       ID_LIKE="fedora"
       VERSION_ID="8.2"
       PLATFORM_ID="platform:el8"
       PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
       ANSI_COLOR="0;31"
    redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
    system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

 uname -a:
    Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
    x86_64 x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2018-12207 (iTLB Multihit):                     Not affected
```

(Continued on next page)

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

SPECrate®2017_int_base = 270

SPECrate®2017_int_peak = Not Run

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

Test Date: Jun-2021
Hardware Availability: Aug-2021
Software Availability: Aug-2020

Platform Notes (Continued)

```
CVE-2018-3620 (L1 Terminal Fault):              Not affected
Microarchitectural Data Sampling:               Not affected
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: usercopy/swapgs
                                                 barriers and __user pointer
                                                 sanitization
CVE-2017-5715 (Spectre variant 2):               Mitigation: Enhanced IBRS, IBPB:
                                                 conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): No status reported
CVE-2019-11135 (TSX Asynchronous Abort):         Not affected


run-level 3 Jun 16 12:00

SPEC is set to: /home/PVT/speccpu-1.1.8
   Filesystem      Type   Size   Used Avail Use% Mounted on
   /dev/sdb5       xfs    328G    78G  251G  24% /home

From /sys/devices/virtual/dmi/id
     Vendor:         FUJITSU
     Product:        PRIMERGY RX2540 M6
     Product Family: SERVER
     Serial:         EWAAxxxxxx


Additional information from dmidecode 3.2 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:
     32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200, configured at 2666

BIOS:
   BIOS Vendor:      FUJITSU
   BIOS Version:     V1.0.0.0 R1.2.0 for D3891-A1x
   BIOS Date:        04/01/2021
   BIOS Revision:    1.2
   Firmware Revision: 3.20

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C        | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
```

(Continued on next page)

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

SPECrate®2017_int_base =   270

SPECrate®2017_int_peak = Not Run

Compiler Version Notes (Continued)

```
          | 525.x264_r(base) 557.xz_r(base)
--------------------------------------------------------------------------
Intel(R) C Compiler for applications running on Intel(R) 64, Version
  19.1.2.275 Build 20200604
Copyright (C) 1985-2020 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++ Compiler for applications running on Intel(R) 64, Version
  19.1.2.275 Build 20200604
Copyright (C) 1985-2020 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 19.1.2.275 Build 20200623
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icc`

C++ benchmarks:
`icpc`

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`

(Continued on next page)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

SPECrate®2017_int_base =   270

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2021

Hardware Availability: Aug-2021

Software Availability: Aug-2020

Base Portability Flags (Continued)

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:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX2 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmalloc
```

C++ benchmarks:

```
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:

```
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmalloc
```

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-ICL-RevA.html
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.html

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

http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-ICL-RevA.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml

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

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Silver 4316, 2.30GHz

SPECrate®2017_int_base = 270

SPECrate®2017_int_peak = Not Run

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

Tested with SPEC CPU®2017 v1.1.8 on 2021-06-16 12:02:02-0400.
Report generated on 2021-07-21 15:48:35 by CPU2017 PDF formatter v6442.
Originally published on 2021-07-20.