SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Fujitsu

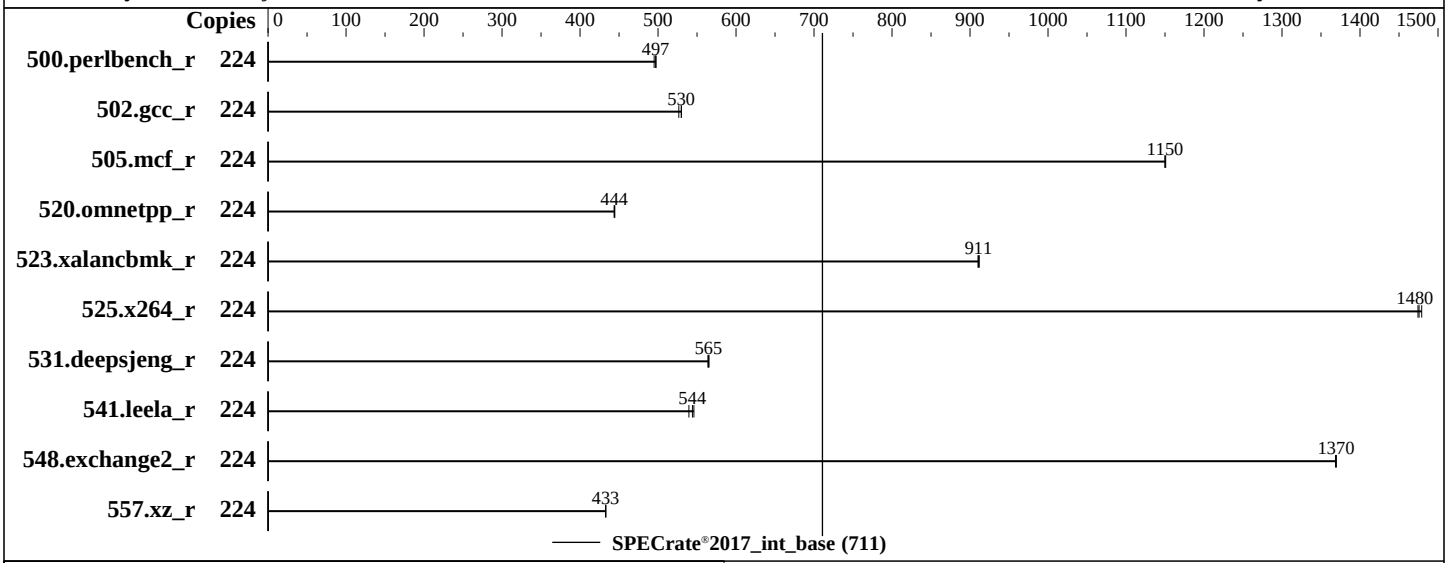
PRIMERGY RX4770 M6, Intel Xeon Platinum 8376HL, 2.60GHz

SPECrate®2017_int_base = 711

SPECrate®2017_int_peak = Not Run

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

Test Date: Dec-2020
Hardware Availability: Nov-2020
Software Availability: Jul-2020



Hardware

CPU Name:	Intel Xeon Platinum 8376HL
Max MHz:	4300
Nominal:	2600
Enabled:	112 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:	38.5 MB I+D on chip per chip
Other:	None
Memory:	1536 GB (48 x 32 GB 2Rx4 PC4-3200AA-R)
Storage:	1 x SATA M.2 SSD, 480GB
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 SP2 5.3.18-22-default
Compiler:	C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux; Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux
Parallel:	No
Firmware:	Fujitsu BIOS Version V1.0.0.0 R1.8.0 for D3892-A1x. Released Jan-2021 tested as V1.0.0.0 R1.1.1 for D3892-A1x Sep-2020
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	binutils-gold 2.32-7.11.4
Power Management:	BIOS set to prefer performance at the cost of additional power usage

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX4770 M6, Intel Xeon Platinum 8376HL, 2.60GHz

SPECrate®2017_int_base = 711

SPECrate®2017_int_peak = Not Run

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

Test Date: Dec-2020
Hardware Availability: Nov-2020
Software Availability: Jul-2020

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	224	720	495	**718**	**497**	717	498							
502.gcc_r	224	602	527	**599**	**530**	599	530							
505.mcf_r	224	**315**	**1150**	315	1150	315	1150							
520.omnetpp_r	224	661	445	**662**	**444**	662	444							
523.xalancbmk_r	224	259	912	260	910	**260**	**911**							
525.x264_r	224	265	1480	**266**	**1480**	266	1470							
531.deepsjeng_r	224	454	565	455	564	**455**	**565**							
541.leela_r	224	687	540	**682**	**544**	679	546							
548.exchange2_r	224	**429**	**1370**	429	1370	429	1370							
557.xz_r	224	**559**	**433**	559	433	559	433							

SPECrate®2017_int_base = 711

SPECrate®2017_int_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

```
The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.
The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
```

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=1-223
echo 15000000 > /proc/sys/kernel/sched_min_granularity_ns
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/Benchmark/speccpu-ic19_1u1/lib/intel64:/home/Benchmark/speccpu-ic
     19_1u1/lib/ia32:/home/Benchmark/speccpu-ic19_1u1/je5.0.1-32"
MALLOC_CONF = "retain:true"
```

General Notes

```
Binaries compiled on a system with 4x Intel Xeon Platinum 8360H CPU + 1536GB RAM
memory using SUSE Linux Enterprise Server 15 SP2
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.
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.
binutils-gold, an ELF linker
package available from https://software.opensuse.org/package/binutils-gold as follows:
- Click "Show bunutils-gold for other distributions"
- Click "Show community packages" of SUSE SLE-15-SP2
- Click "Expert Download" selecting package corresponding to 2.32 release identified by "home:gabrielftg:ulp-preview"
- Click "Grab binary packages directly"
- Click "binutils-gold-xxxx.rpm"
package was installed with rpm command i.e.:
rpm -i --nodeps bunutils-gold-xxxx.rpm
```

Platform Notes

```
BIOS configuration:
DCU Streamer Prefetcher = Disabled
Intel Virtualization Technology = Disabled
Utilization Profile = Unbalanced
Stale AtoS = Disabled
LLC Deadline Alloc = Disabled
XPT Prefetch = Enabled
Patrol Scrub = Enabled
SNC = Enabled
FAN Control = Full

Sysinfo program /home/Benchmark/speccpu-ic19_1u1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on localhost Sat Dec 26 15:42:31 2020

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
```

(Continued on next page)

Platform Notes (Continued)

```
    model name : Intel(R) Xeon(R) Platinum 8376HL CPU @ 2.60GHz
       4  "physical id"s (chips)
       224 "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 : 28
       siblings  : 56
       physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
       physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
       physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
       physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30

  From lscpu:
       Architecture:        x86_64
       CPU op-mode(s):      32-bit, 64-bit
       Byte Order:          Little Endian
       Address sizes:       46 bits physical, 48 bits virtual
       CPU(s):              224
       On-line CPU(s) list: 0-223
       Thread(s) per core:  2
       Core(s) per socket:  28
       Socket(s):           4
       NUMA node(s):        8
       Vendor ID:           GenuineIntel
       CPU family:          6
       Model:               85
       Model name:          Intel(R) Xeon(R) Platinum 8376HL CPU @ 2.60GHz
       Stepping:            11
       CPU MHz:             1002.414
       CPU max MHz:         4300.0000
       CPU min MHz:         1000.0000
       BogoMIPS:            5200.00
       Virtualization:      VT-x
       L1d cache:           32K
       L1i cache:           32K
       L2 cache:            1024K
       L3 cache:            39424K
       NUMA node0 CPU(s):   0-3,7-9,14-17,21-23,112-115,119-121,126-129,133-135
       NUMA node1 CPU(s):   4-6,10-13,18-20,24-27,116-118,122-125,130-132,136-139
       NUMA node2 CPU(s):   28-31,35-37,42-45,49-51,140-143,147-149,154-157,161-163
       NUMA node3 CPU(s):   32-34,38-41,46-48,52-55,144-146,150-153,158-160,164-167
       NUMA node4 CPU(s):   56-59,63-65,70-73,77-79,168-171,175-177,182-185,189-191
       NUMA node5 CPU(s):   60-62,66-69,74-76,80-83,172-174,178-181,186-188,192-195
```

(Continued on next page)

Platform Notes (Continued)

```
      NUMA node6 CPU(s):   84-87,91-93,98-101,105-107,196-199,203-205,210-213,217-219
      NUMA node7 CPU(s):   88-90,94-97,102-104,108-111,200-202,206-209,214-216,220-223
      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 ept_ad 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 avx512_bf16 dtherm ida arat pln pts hwp hwp_act_window
      hwp_epp hwp_pkg_req pku ospke avx512_vnni md_clear flush_l1d arch_capabilities

  /proc/cpuinfo cache data
     cache size : 39424 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 3 7 8 9 14 15 16 17 21 22 23 112 113 114 115 119 120 121 126 127 128
    129 133 134 135
    node 0 size: 192126 MB
    node 0 free: 191580 MB
    node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 116 117 118 122 123 124 125 130 131
    132 136 137 138 139
    node 1 size: 193529 MB
    node 1 free: 193086 MB
    node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 140 141 142 143 147 148 149 154
    155 156 157 161 162 163
    node 2 size: 193529 MB
    node 2 free: 193332 MB
    node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 144 145 146 150 151 152 153 158
    159 160 164 165 166 167
    node 3 size: 193529 MB
    node 3 free: 193356 MB
    node 4 cpus: 56 57 58 59 63 64 65 70 71 72 73 77 78 79 168 169 170 171 175 176 177 182
    183 184 185 189 190 191
    node 4 size: 193495 MB
    node 4 free: 193329 MB
    node 5 cpus: 60 61 62 66 67 68 69 74 75 76 80 81 82 83 172 173 174 178 179 180 181 186
    187 188 192 193 194 195
    node 5 size: 193529 MB
    node 5 free: 193357 MB
    node 6 cpus: 84 85 86 87 91 92 93 98 99 100 101 105 106 107 196 197 198 199 203 204 205
    210 211 212 213 217 218 219
```

(Continued on next page)

Platform Notes (Continued)

```
   node 6 size: 193529 MB
   node 6 free: 193351 MB
   node 7 cpus: 88 89 90 94 95 96 97 102 103 104 108 109 110 111 200 201 202 206 207 208
   209 214 215 216 220 221 222 223
   node 7 size: 193302 MB
   node 7 free: 193119 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  11  20  20  20  20  20  20
     1:  11  10  20  20  20  20  20  20
     2:  20  20  10  11  20  20  20  20
     3:  20  20  11  10  20  20  20  20
     4:  20  20  20  20  10  11  20  20
     5:  20  20  20  20  11  10  20  20
     6:  20  20  20  20  20  20  10  11
     7:  20  20  20  20  20  20  11  10

From /proc/meminfo
   MemTotal:       1583688748 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP2"
      VERSION_ID="15.2"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
   Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) x86_64
   x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

itlb_multihit:                          Not affected
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
```

(Continued on next page)

Platform Notes (Continued)

```
 CVE-2017-5715 (Spectre variant 2):        Mitigation: Enhanced IBRS, IBPB: conditional,
                                            RSB filling
 srbds:                                    Not affected
 tsx_async_abort:                          Not affected

 run-level 3 Dec 26 15:39

 SPEC is set to: /home/Benchmark/speccpu-ic19_1u1
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sdb3      xfs   376G   94G  282G  25% /home

 From /sys/devices/virtual/dmi/id
     BIOS:    FUJITSU V1.0.0.0 R1.1.1 for D3892-A1x            09/25/2020
     Vendor:  FUJITSU
     Product: PRIMERGY RX4770 M6
     Product Family: SERVER
     Serial:  MABTxxxxxx

 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 Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

 (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 Compiler for applications running on Intel(R) 64, Version 2021.1
  NextGen Build 20200304
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 2021.1
  NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

(Continued on next page)

Compiler Version Notes (Continued)

```
==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.1.1.217 Build 20200306
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
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-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4
-L/opt/intel/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin

(Continued on next page)

Base Optimization Flags (Continued)

C benchmarks (continued):
-lqkmalloc

C++ benchmarks:
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/opt/intel/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
-L/opt/intel/compilers_and_libraries_2020.1.217/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-CPL-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-CPL-RevA.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.1.0 on 2020-12-26 01:42:31-0500.
Report generated on 2021-02-02 19:48:11 by CPU2017 PS formatter v6255.
Originally published on 2021-02-02.