SPEC CPU®2017 Integer Rate Result

Fujitsu

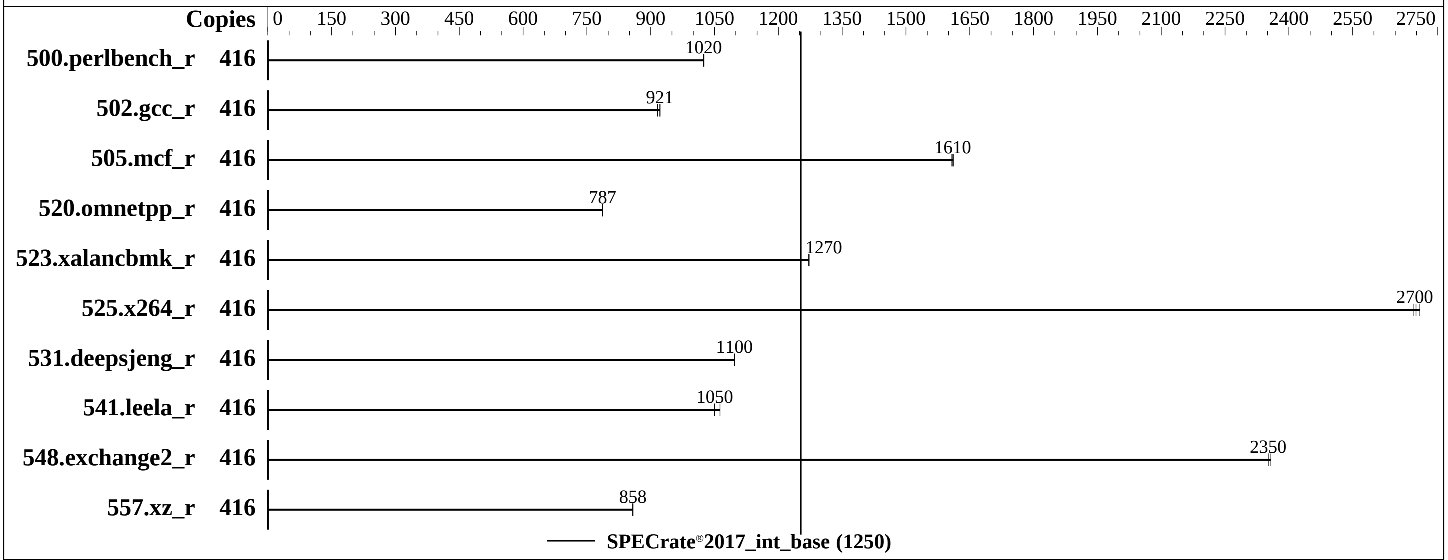
PRIMEQUEST 3800E2, Intel Xeon Platinum 8270, 2.70GHz

SPECrate®2017_int_base = 1250

SPECrate®2017_int_peak = Not Run

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

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



Hardware

CPU Name:	Intel Xeon Platinum 8270
Max MHz:	4000
Nominal:	2700
Enabled:	208 cores, 8 chips, 2 threads/core
Orderable:	2,4,6,8 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	35.75 MB I+D on chip per chip
Other:	None
Memory:	3 TB (96 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:	--

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	416	646	1030	647	1020	**646**	**1020**							
502.gcc_r	416	639	922	643	916	**639**	**921**							
505.mcf_r	416	**418**	**1610**	417	1610	418	1610							
520.omnetpp_r	416	**694**	**787**	693	788	694	786							
523.xalancbmk_r	416	346	1270	345	1270	**346**	**1270**							
525.x264_r	416	269	2710	**270**	**2700**	270	2690							
531.deepsjeng_r	416	435	1100	435	1100	**435**	**1100**							
541.leela_r	416	656	1050	**656**	**1050**	648	1060							
548.exchange2_r	416	462	2360	**464**	**2350**	464	2350							
557.xz_r	416	524	858	**523**	**858**	523	858							

SPECrate®2017_int_base = 1250

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=1-415
```

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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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

```
 BIOS configuration:
 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 Sat Jul  6 22:56:42 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) Platinum 8270 CPU @ 2.70GHz
       8  "physical id"s (chips)
       416 "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 : 26
       siblings  : 52
       physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
       29
       physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
       29
       physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
       29
       physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
       29
       physical 4: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
       29
       physical 5: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
       29
       physical 6: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
       29
       physical 7: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
```

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Platform Notes (Continued)

```
      29

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                416
      On-line CPU(s) list: 0-415
      Thread(s) per core:  2
      Core(s) per socket:  26
      Socket(s):             8
      NUMA node(s):          16
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Platinum 8270 CPU @ 2.70GHz
      Stepping:              6
      CPU MHz:               2700.000
      CPU max MHz:           4000.0000
      CPU min MHz:           1000.0000
      BogoMIPS:              5400.00
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              36608K
      NUMA node0 CPU(s):     0-3,7-9,13-15,20-22,208-211,215-217,221-223,228-230
      NUMA node1 CPU(s):     4-6,10-12,16-19,23-25,212-214,218-220,224-227,231-233
      NUMA node2 CPU(s):     26-29,33-35,39-41,46-48,234-237,241-243,247-249,254-256
      NUMA node3 CPU(s):     30-32,36-38,42-45,49-51,238-240,244-246,250-253,257-259
      NUMA node4 CPU(s):     52-55,59-61,65-67,72-74,260-263,267-269,273-275,280-282
      NUMA node5 CPU(s):     56-58,62-64,68-71,75-77,264-266,270-272,276-279,283-285
      NUMA node6 CPU(s):     78-81,85-87,91-93,98-100,286-289,293-295,299-301,306-308
      NUMA node7 CPU(s):     82-84,88-90,94-97,101-103,290-292,296-298,302-305,309-311
      NUMA node8 CPU(s):   104-107,111-113,117-119,124-126,312-315,319-321,325-327,332-334
      NUMA node9 CPU(s):   108-110,114-116,120-123,127-129,316-318,322-324,328-331,335-337
      NUMA node10 CPU(s):  130-133,137-139,143-145,150-152,338-341,345-347,351-353,358-360
      NUMA node11 CPU(s):  134-136,140-142,146-149,153-155,342-344,348-350,354-357,361-363
      NUMA node12 CPU(s):  156-159,163-165,169-171,176-178,364-367,371-373,377-379,384-386
      NUMA node13 CPU(s):  160-162,166-168,172-175,179-181,368-370,374-376,380-383,387-389
      NUMA node14 CPU(s):  182-185,189-191,195-197,202-204,390-393,397-399,403-405,410-412
      NUMA node15 CPU(s):  186-188,192-194,198-201,205-207,394-396,400-402,406-409,413-415
      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
```

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Platform Notes (Continued)

```
      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 : 36608 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
   available: 16 nodes (0-15)
   node 0 cpus: 0 1 2 3 7 8 9 13 14 15 20 21 22 208 209 210 211 215 216 217 221 222 223
   228 229 230
   node 0 size: 192268 MB
   node 0 free: 191963 MB
   node 1 cpus: 4 5 6 10 11 12 16 17 18 19 23 24 25 212 213 214 218 219 220 224 225 226
   227 231 232 233
   node 1 size: 193529 MB
   node 1 free: 193330 MB
   node 2 cpus: 26 27 28 29 33 34 35 39 40 41 46 47 48 234 235 236 237 241 242 243 247 248
   249 254 255 256
   node 2 size: 193529 MB
   node 2 free: 193323 MB
   node 3 cpus: 30 31 32 36 37 38 42 43 44 45 49 50 51 238 239 240 244 245 246 250 251 252
   253 257 258 259
   node 3 size: 193529 MB
   node 3 free: 193301 MB
   node 4 cpus: 52 53 54 55 59 60 61 65 66 67 72 73 74 260 261 262 263 267 268 269 273 274
   275 280 281 282
   node 4 size: 193529 MB
   node 4 free: 193278 MB
   node 5 cpus: 56 57 58 62 63 64 68 69 70 71 75 76 77 264 265 266 270 271 272 276 277 278
   279 283 284 285
   node 5 size: 193529 MB
   node 5 free: 193319 MB
   node 6 cpus: 78 79 80 81 85 86 87 91 92 93 98 99 100 286 287 288 289 293 294 295 299
   300 301 306 307 308
   node 6 size: 193529 MB
   node 6 free: 193136 MB
   node 7 cpus: 82 83 84 88 89 90 94 95 96 97 101 102 103 290 291 292 296 297 298 302 303
   304 305 309 310 311
   node 7 size: 193529 MB
   node 7 free: 193105 MB
   node 8 cpus: 104 105 106 107 111 112 113 117 118 119 124 125 126 312 313 314 315 319
```

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Platform Notes (Continued)

```
   320 321 325 326 327 332 333 334
   node 8 size: 193529 MB
   node 8 free: 193043 MB
   node 9 cpus: 108 109 110 114 115 116 120 121 122 123 127 128 129 316 317 318 322 323
   324 328 329 330 331 335 336 337
   node 9 size: 193500 MB
   node 9 free: 193137 MB
   node 10 cpus: 130 131 132 133 137 138 139 143 144 145 150 151 152 338 339 340 341 345
   346 347 351 352 353 358 359 360
   node 10 size: 193529 MB
   node 10 free: 193171 MB
   node 11 cpus: 134 135 136 140 141 142 146 147 148 149 153 154 155 342 343 344 348 349
   350 354 355 356 357 361 362 363
   node 11 size: 193529 MB
   node 11 free: 193286 MB
   node 12 cpus: 156 157 158 159 163 164 165 169 170 171 176 177 178 364 365 366 367 371
   372 373 377 378 379 384 385 386
   node 12 size: 193529 MB
   node 12 free: 193339 MB
   node 13 cpus: 160 161 162 166 167 168 172 173 174 175 179 180 181 368 369 370 374 375
   376 380 381 382 383 387 388 389
   node 13 size: 193529 MB
   node 13 free: 193328 MB
   node 14 cpus: 182 183 184 185 189 190 191 195 196 197 202 203 204 390 391 392 393 397
   398 399 403 404 405 410 411 412
   node 14 size: 193529 MB
   node 14 free: 192946 MB
   node 15 cpus: 186 187 188 192 193 194 198 199 200 201 205 206 207 394 395 396 400 401
   402 406 407 408 409 413 414 415
   node 15 size: 193326 MB
   node 15 free: 193089 MB
   node distances:
   node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
     0:  10  11  20  20  20  20  28  28  28  28  28  28  20  20  28  28
     1:  11  10  20  20  20  20  28  28  28  28  28  28  20  20  28  28
     2:  20  20  10  11  28  28  20  20  28  28  20  20  28  28  28  28
     3:  20  20  11  10  28  28  20  20  28  28  20  20  28  28  28  28
     4:  20  20  28  28  10  11  20  20  20  20  28  28  28  28  28  28
     5:  20  20  28  28  11  10  20  20  20  20  28  28  28  28  28  28
     6:  28  28  20  20  20  20  10  11  28  28  28  28  28  28  20  20
     7:  28  28  20  20  20  20  11  10  28  28  28  28  28  28  20  20
     8:  28  28  28  28  20  20  28  28  10  11  20  20  20  20  28  28
     9:  28  28  28  28  20  20  28  28  11  10  20  20  20  20  28  28
    10:  28  28  20  20  28  28  28  28  20  20  10  11  28  28  20  20
    11:  28  28  20  20  28  28  28  28  20  20  11  10  28  28  20  20
    12:  20  20  28  28  28  28  28  28  20  20  28  28  10  11  20  20
    13:  20  20  28  28  28  28  28  28  20  20  28  28  11  10  20  20
```

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Platform Notes (Continued)

```
   14:  28  28  28  28  28  28  20  20  28  28  20  20  20  20  10  11
   15:  28  28  28  28  28  28  20  20  28  28  20  20  20  20  11  10

From /proc/meminfo
   MemTotal:       3169263428 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

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 Jul 6 22:54

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:
   68x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
   28x 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.
------------------------------------------------------------------------------

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

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Base Portability Flags (Continued)

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
-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.

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