SPEC CPU®2017 Integer Rate Result

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Fujitsu

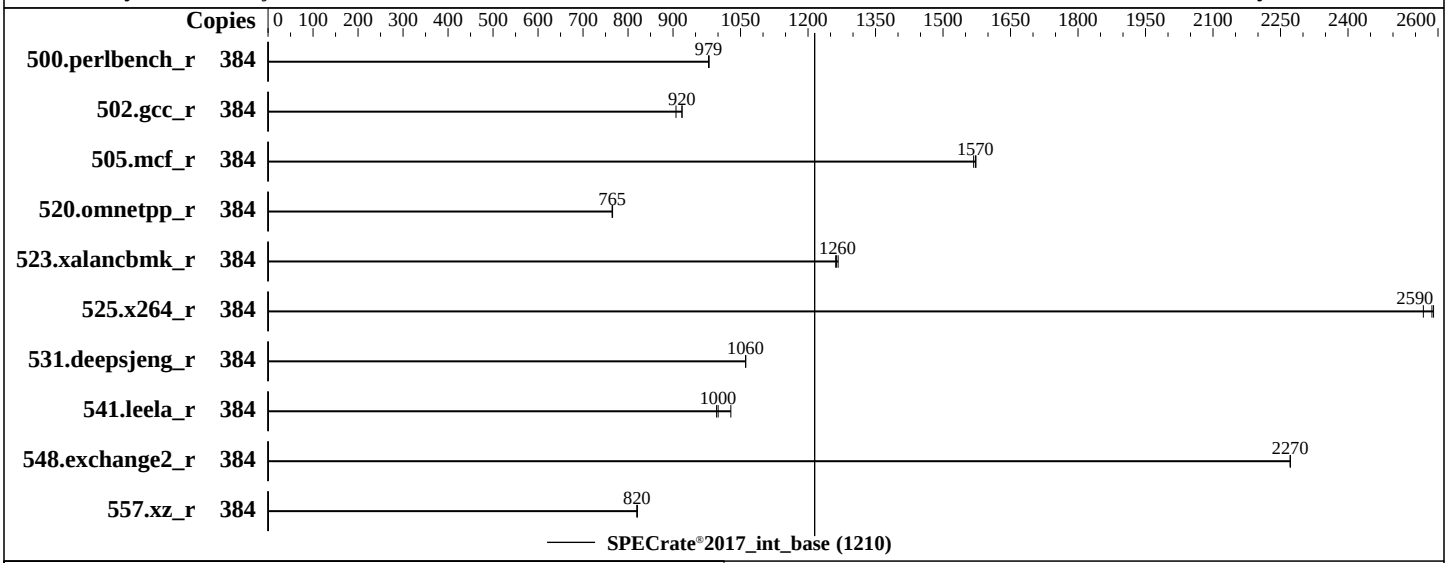
PRIMEQUEST 3800E2, Intel Xeon Platinum 8268, 2.90GHz

SPECrate®2017_int_base = 1210

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 8268
Max MHz:	3900
Nominal:	2900
Enabled:	192 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:	--

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	384	625	979	624	980	**624**	**979**							
502.gcc_r	384	591	920	**591**	**920**	600	907							
505.mcf_r	384	394	1570	396	1570	**395**	**1570**							
520.omnetpp_r	384	**658**	**765**	659	765	658	766							
523.xalancbmk_r	384	**321**	**1260**	321	1260	320	1270							
525.x264_r	384	**260**	**2590**	262	2570	260	2590							
531.deepsjeng_r	384	414	1060	415	1060	**415**	**1060**							
541.leela_r	384	638	997	**636**	**1000**	618	1030							
548.exchange2_r	384	**443**	**2270**	443	2270	443	2270							
557.xz_r	384	506	820	**506**	**820**	505	821							

SPECrate®2017_int_base = 1210

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=1-383
```

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.
```

(Continued on next page)

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 Thu Jul  4 15:04:40 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) Platinum 8268 CPU @ 2.90GHz
       8  "physical id"s (chips)
       384 "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 : 24
       siblings  : 48
       physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
       physical 1: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 22 24 25 26 27 28 29
       physical 2: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
       physical 3: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 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 22 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 25 26 27 28 29
       physical 6: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
       physical 7: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

 From lscpu:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
      CPU(s):              384
      On-line CPU(s) list: 0-383
```

(Continued on next page)

Platform Notes (Continued)

```
Thread(s) per core:  2
Core(s) per socket:  24
Socket(s):           8
NUMA node(s):        16
Vendor ID:           GenuineIntel
CPU family:          6
Model:               85
Model name:          Intel(R) Xeon(R) Platinum 8268 CPU @ 2.90GHz
Stepping:            6
CPU MHz:             2900.000
CPU max MHz:         3900.0000
CPU min MHz:         1200.0000
BogoMIPS:            5800.00
Virtualization:      VT-x
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            36608K
NUMA node0 CPU(s):   0-3,7-9,13-15,19,20,192-195,199-201,205-207,211,212
NUMA node1 CPU(s):   4-6,10-12,16-18,21-23,196-198,202-204,208-210,213-215
NUMA node2 CPU(s):   24-27,31,32,36-38,42-44,216-219,223,224,228-230,234-236
NUMA node3 CPU(s):   28-30,33-35,39-41,45-47,220-222,225-227,231-233,237-239
NUMA node4 CPU(s):   48-51,55,56,60-62,66-68,240-243,247,248,252-254,258-260
NUMA node5 CPU(s):   52-54,57-59,63-65,69-71,244-246,249-251,255-257,261-263
NUMA node6 CPU(s):   72-75,79,80,84-86,90-92,264-267,271,272,276-278,282-284
NUMA node7 CPU(s):   76-78,81-83,87-89,93-95,268-270,273-275,279-281,285-287
NUMA node8 CPU(s):   96-99,103-105,109-111,115,116,288-291,295-297,301-303,307,308
NUMA node9 CPU(s):   100-102,106-108,112-114,117-119,292-294,298-300,304-306,309-311
NUMA node10 CPU(s):  120-123,127-129,133-135,139,140,312-315,319-321,325-327,331,332
NUMA node11 CPU(s):  124-126,130-132,136-138,141-143,316-318,322-324,328-330,333-335
NUMA node12 CPU(s):  144-147,151,152,156-158,162-164,336-339,343,344,348-350,354-356
NUMA node13 CPU(s):  148-150,153-155,159-161,165-167,340-342,345-347,351-353,357-359
NUMA node14 CPU(s):  168-171,175,176,180-182,186-188,360-363,367,368,372-374,378-380
NUMA node15 CPU(s):  172-174,177-179,183-185,189-191,364-366,369-371,375-377,381-383
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
```

(Continued on next page)

Platform Notes (Continued)

```
 /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 19 20 192 193 194 195 199 200 201 205 206 207 211
   212
   node 0 size: 192268 MB
   node 0 free: 191725 MB
   node 1 cpus: 4 5 6 10 11 12 16 17 18 21 22 23 196 197 198 202 203 204 208 209 210 213
   214 215
   node 1 size: 193529 MB
   node 1 free: 193244 MB
   node 2 cpus: 24 25 26 27 31 32 36 37 38 42 43 44 216 217 218 219 223 224 228 229 230
   234 235 236
   node 2 size: 193529 MB
   node 2 free: 193207 MB
   node 3 cpus: 28 29 30 33 34 35 39 40 41 45 46 47 220 221 222 225 226 227 231 232 233
   237 238 239
   node 3 size: 193529 MB
   node 3 free: 193283 MB
   node 4 cpus: 48 49 50 51 55 56 60 61 62 66 67 68 240 241 242 243 247 248 252 253 254
   258 259 260
   node 4 size: 193529 MB
   node 4 free: 193347 MB
   node 5 cpus: 52 53 54 57 58 59 63 64 65 69 70 71 244 245 246 249 250 251 255 256 257
   261 262 263
   node 5 size: 193529 MB
   node 5 free: 193356 MB
   node 6 cpus: 72 73 74 75 79 80 84 85 86 90 91 92 264 265 266 267 271 272 276 277 278
   282 283 284
   node 6 size: 193529 MB
   node 6 free: 193356 MB
   node 7 cpus: 76 77 78 81 82 83 87 88 89 93 94 95 268 269 270 273 274 275 279 280 281
   285 286 287
   node 7 size: 193529 MB
   node 7 free: 193049 MB
   node 8 cpus: 96 97 98 99 103 104 105 109 110 111 115 116 288 289 290 291 295 296 297
   301 302 303 307 308
   node 8 size: 193500 MB
   node 8 free: 193313 MB
   node 9 cpus: 100 101 102 106 107 108 112 113 114 117 118 119 292 293 294 298 299 300
   304 305 306 309 310 311
   node 9 size: 193529 MB
   node 9 free: 193347 MB
   node 10 cpus: 120 121 122 123 127 128 129 133 134 135 139 140 312 313 314 315 319 320
```

(Continued on next page)

Platform Notes (Continued)

```
   321 325 326 327 331 332
   node 10 size: 193529 MB
   node 10 free: 193360 MB
   node 11 cpus: 124 125 126 130 131 132 136 137 138 141 142 143 316 317 318 322 323 324
   328 329 330 333 334 335
   node 11 size: 193529 MB
   node 11 free: 193358 MB
   node 12 cpus: 144 145 146 147 151 152 156 157 158 162 163 164 336 337 338 339 343 344
   348 349 350 354 355 356
   node 12 size: 193529 MB
   node 12 free: 193290 MB
   node 13 cpus: 148 149 150 153 154 155 159 160 161 165 166 167 340 341 342 345 346 347
   351 352 353 357 358 359
   node 13 size: 193529 MB
   node 13 free: 193173 MB
   node 14 cpus: 168 169 170 171 175 176 180 181 182 186 187 188 360 361 362 363 367 368
   372 373 374 378 379 380
   node 14 size: 193529 MB
   node 14 free: 193273 MB
   node 15 cpus: 172 173 174 177 178 179 183 184 185 189 190 191 364 365 366 369 370 371
   375 376 377 381 382 383
   node 15 size: 193326 MB
   node 15 free: 193107 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
    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:       3169263432 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB
```

(Continued on next page)

Platform Notes (Continued)

```
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 4 14:56

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,
```


(Continued on next page)

Compiler Version Notes (Continued)

```
  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`
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`

(Continued on next page)

Base Portability Flags (Continued)

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

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

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