SPEC® CPU2017 Integer Rate Result

Fujitsu

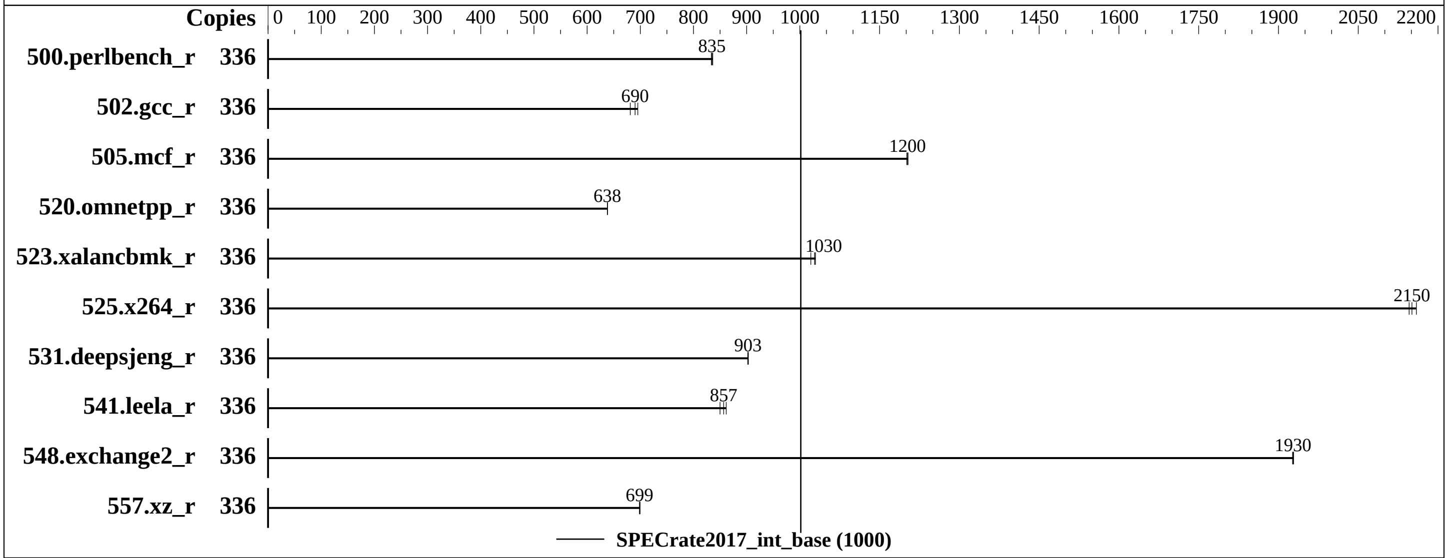
PRIMEQUEST 3800B2, Intel Xeon Platinum 8280L, 2.70GHz

SPECrate2017_int_base = 1000

SPECrate2017_int_peak = Not Run

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

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



Hardware

CPU Name:	Intel Xeon Platinum 8280L
Max MHz.:	4000
Nominal:	2700
Enabled:	168 cores, 6 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:	38.5 MB I+D on chip per chip
Other:	None
Memory:	2304 GB (72 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:	Fujitsu BIOS Version V1.0.0.0 R1.21.0 for D3858-B1x. Released Jun-2019 tested as V1.0.0.0 R91.11.0 for D3858-B1x Mar-2019
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	None

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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	336	640	836	642	834	**641**	**835**							
502.gcc_r	336	684	695	699	681	**689**	**690**							
505.mcf_r	336	452	1200	451	1200	**452**	**1200**							
520.omnetpp_r	336	691	638	691	638	**691**	**638**							
523.xalancbmk_r	336	345	1030	348	1020	**345**	**1030**							
525.x264_r	336	**274**	**2150**	272	2160	274	2150							
531.deepsjeng_r	336	427	902	426	903	**427**	**903**							
541.leela_r	336	**649**	**857**	646	862	655	850							
548.exchange2_r	336	457	1930	**457**	**1930**	456	1930							
557.xz_r	336	519	699	**519**	**699**	519	700							

SPECrate2017_int_base = 1000

SPECrate2017_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=1-335
```

General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-int/lib/ia32"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/Benchmark/speccpu2017-int/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/Benchmark/speccpu2017-int/je5.0.1-64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/Benchmark/speccpu2017-int/je5.0.1-64"

 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>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
```

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General Notes (Continued)

```
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
HWPM Support = Native Mode with no legacy
Stale AtoS = 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 Sun Mar 17 06:58:51 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 8280L CPU @ 2.70GHz
      6  "physical id"s (chips)
      336 "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
      physical 4: 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 5: 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:
```

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Platform Notes (Continued)

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                336
On-line CPU(s) list:   0-335
Thread(s) per core:    2
Core(s) per socket:    28
Socket(s):             6
NUMA node(s):          12
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Platinum 8280L 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:              39424K
NUMA node0 CPU(s):     0-3,7-9,14-17,21-23,168-171,175-177,182-185,189-191
NUMA node1 CPU(s):     4-6,10-13,18-20,24-27,172-174,178-181,186-188,192-195
NUMA node2 CPU(s):     28-31,35-37,42-45,49-51,196-199,203-205,210-213,217-219
NUMA node3 CPU(s):     32-34,38-41,46-48,52-55,200-202,206-209,214-216,220-223
NUMA node4 CPU(s):     56-59,63-65,70-73,77-79,224-227,231-233,238-241,245-247
NUMA node5 CPU(s):     60-62,66-69,74-76,80-83,228-230,234-237,242-244,248-251
NUMA node6 CPU(s):     84-87,91-93,98-101,105-107,252-255,259-261,266-269,273-275
NUMA node7 CPU(s):     88-90,94-97,102-104,108-111,256-258,262-265,270-272,276-279
NUMA node8 CPU(s):    112-115,119-121,126-129,133-135,280-283,287-289,294-297,301-303
NUMA node9 CPU(s):    116-118,122-125,130-132,136-139,284-286,290-293,298-300,304-307
NUMA node10 CPU(s):   140-143,147-149,154-157,161-163,308-311,315-317,322-325,329-331
NUMA node11 CPU(s):   144-146,150-153,158-160,164-167,312-314,318-321,326-328,332-335
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 : 39424 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
   available: 12 nodes (0-11)
   node 0 cpus: 0 1 2 3 7 8 9 14 15 16 17 21 22 23 168 169 170 171 175 176 177 182 183 184
   185 189 190 191
   node 0 size: 192119 MB
   node 0 free: 191468 MB
   node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 172 173 174 178 179 180 181 186 187
   188 192 193 194 195
   node 1 size: 193527 MB
   node 1 free: 193145 MB
   node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 196 197 198 199 203 204 205 210
   211 212 213 217 218 219
   node 2 size: 193527 MB
   node 2 free: 193226 MB
   node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 200 201 202 206 207 208 209 214
   215 216 220 221 222 223
   node 3 size: 193527 MB
   node 3 free: 193108 MB
   node 4 cpus: 56 57 58 59 63 64 65 70 71 72 73 77 78 79 224 225 226 227 231 232 233 238
   239 240 241 245 246 247
   node 4 size: 193527 MB
   node 4 free: 193296 MB
   node 5 cpus: 60 61 62 66 67 68 69 74 75 76 80 81 82 83 228 229 230 234 235 236 237 242
   243 244 248 249 250 251
   node 5 size: 193527 MB
   node 5 free: 193220 MB
   node 6 cpus: 84 85 86 87 91 92 93 98 99 100 101 105 106 107 252 253 254 255 259 260 261
   266 267 268 269 273 274 275
   node 6 size: 193527 MB
   node 6 free: 193294 MB
   node 7 cpus: 88 89 90 94 95 96 97 102 103 104 108 109 110 111 256 257 258 262 263 264
   265 270 271 272 276 277 278 279
   node 7 size: 193527 MB
   node 7 free: 193303 MB
   node 8 cpus: 112 113 114 115 119 120 121 126 127 128 129 133 134 135 280 281 282 283
   287 288 289 294 295 296 297 301 302 303
   node 8 size: 193528 MB
   node 8 free: 193202 MB
   node 9 cpus: 116 117 118 122 123 124 125 130 131 132 136 137 138 139 284 285 286 290
   291 292 293 298 299 300 304 305 306 307
   node 9 size: 193528 MB
   node 9 free: 193302 MB
```

(Continued on next page)

Platform Notes (Continued)

```
    node 10 cpus: 140 141 142 143 147 148 149 154 155 156 157 161 162 163 308 309 310 311
    315 316 317 322 323 324 325 329 330 331
    node 10 size: 193528 MB
    node 10 free: 193297 MB
    node 11 cpus: 144 145 146 150 151 152 153 158 159 160 164 165 166 167 312 313 314 318
    319 320 321 326 327 328 332 333 334 335
    node 11 size: 193324 MB
    node 11 free: 193090 MB
    node distances:
    node   0   1   2   3   4   5   6   7   8   9  10  11
      0:  10  11  20  20  20  20  28  28  28  28  28  28
      1:  11  10  20  20  20  20  28  28  28  28  28  28
      2:  20  20  10  11  28  28  20  20  28  28  20  20
      3:  20  20  11  10  28  28  20  20  28  28  20  20
      4:  20  20  28  28  10  11  20  20  20  20  28  28
      5:  20  20  28  28  11  10  20  20  20  20  28  28
      6:  28  28  20  20  20  20  10  11  28  28  28  28
      7:  28  28  20  20  20  20  11  10  28  28  28  28
      8:  28  28  28  28  20  20  28  28  10  11  20  20
      9:  28  28  28  28  20  20  28  28  11  10  20  20
     10:  28  28  20  20  28  28  28  28  20  20  10  11
     11:  28  28  20  20  28  28  28  28  20  20  11  10

  From /proc/meminfo
     MemTotal:       2376420476 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
```

(Continued on next page)

Platform Notes (Continued)

```
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB
filling

run-level 3 Mar 17 06:55

SPEC is set to: /home/Benchmark/speccpu2017-int
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda3      xfs   142G   17G  125G  12% /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 R91.11.0 for D3858-B1x           03/15/2019
  Memory:
   56x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
   16x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CC  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.
------------------------------------------------------------------------------

==============================================================================
 CXXC 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.
------------------------------------------------------------------------------

==============================================================================
 FC  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.
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
```

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
```

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
```

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Base Optimization Flags (Continued)

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-RevA.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-RevA.xml

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

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