



SPEC® CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Supermicro

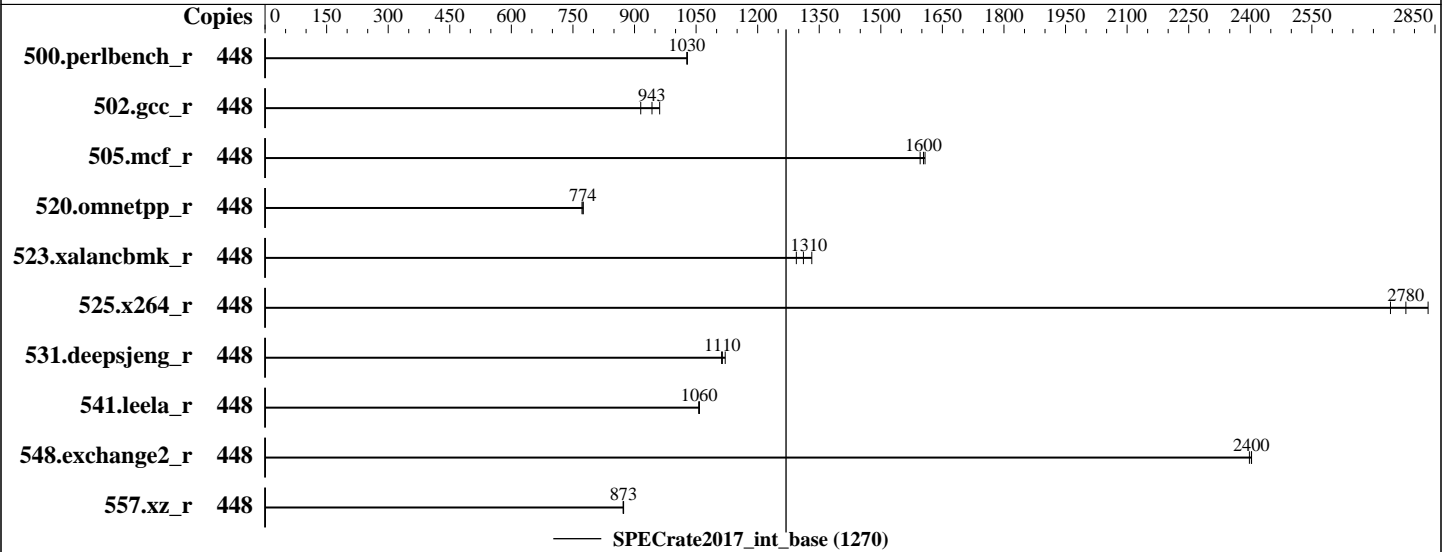
SuperServer 7089P-TR4T (X11OPi, Intel Xeon Platinum 8280)

SPECrate2017_int_base = 1270

SPECrate2017_int_peak = Not Run

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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



Hardware

CPU Name: Intel Xeon Platinum 8280
Max MHz.: 4000
Nominal: 2700
Enabled: 224 cores, 8 chips, 2 threads/core
Orderable: 2,4,8 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: 3 TB (96 x 32 GB 2Rx4 PC4-2933Y-R)
Storage: 1x 2 TB SATA III SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP4
4.12.14-94.41-default
Compiler: C/C++: Version 19.0.1.144 of Intel C/C++
Compiler Build 20181018 for Linux;
Fortran: Version 19.0.1.144 of Intel Fortran
Compiler Build 20181018 for Linux
Parallel: No
Firmware: Supermicro BIOS version 3.0a released Mar-2019 tested as Feb-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	448	693	1030	694	1030	694	1030									
502.gcc_r	448	673	943	693	915	660	961									
505.mcf_r	448	454	1600	451	1600	450	1610									
520.omnetpp_r	448	758	775	759	774	761	772									
523.xalancbmk_r	448	355	1330	366	1290	361	1310									
525.x264_r	448	286	2740	282	2780	277	2830									
531.deepsjeng_r	448	461	1110	462	1110	458	1120									
541.leela_r	448	702	1060	702	1060	701	1060									
548.exchange2_r	448	489	2400	489	2400	488	2400									
557.xz_r	448	554	873	554	873	555	872									

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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"

General Notes

Environment variables set by runcpu before the start of the run:

LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/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-2017-5753 (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.

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General Notes (Continued)

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Platform Notes

BIOS Settings:

SNC = Enable
IMC Interleave = 1-Way
Monitor/Mwait = Disable
Power Technology = Custom
Power Performance Tuning = BIOS Control EPB
Energy PERF BIAS CFG mode = Performance
Hardware P-state = Native Mode
XPT Prefetch = Enable
KTI Prefetch = Disable
Stale AtoS = Disable
LLC dead line alloc = Disable
Local/Remote Threshold = Medium
Patrol Scrub = Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux Fri Mar 15 11:03:08 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 8280 CPU @ 2.70GHz
 8 "physical id"s (chips)
448 "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
```

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Platform Notes (Continued)

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
physical 6: 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 7: 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
CPU(s): 448
On-line CPU(s) list: 0-447
Thread(s) per core: 2
Core(s) per socket: 28
Socket(s): 8
NUMA node(s): 16
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8280 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): 0,225-231,238-243,252-259,266-271
NUMA node1 CPU(s): 1-7,14-19,28-35,42-47,224
NUMA node2 CPU(s): 8-13,20-27,36-41,48-55
NUMA node3 CPU(s): 56-63,70-75,84-91,98-103
NUMA node4 CPU(s): 64-69,76-83,92-97,104-111
NUMA node5 CPU(s): 112-119,126-131,140-147,154-159
NUMA node6 CPU(s): 120-125,132-139,148-153,160-167
NUMA node7 CPU(s): 168-175,182-187,196-203,210-215
NUMA node8 CPU(s): 176-181,188-195,204-209,216-223
NUMA node9 CPU(s): 232-237,244-251,260-265,272-279
NUMA node10 CPU(s): 280-287,294-299,308-315,322-327
NUMA node11 CPU(s): 288-293,300-307,316-321,328-335
NUMA node12 CPU(s): 336-343,350-355,364-371,378-383
NUMA node13 CPU(s): 344-349,356-363,372-377,384-391
NUMA node14 CPU(s): 392-399,406-411,420-427,434-439
NUMA node15 CPU(s): 400-405,412-419,428-433,440-447

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Platform Notes (Continued)

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 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 ssbd mba ibrs ibpb stibp 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 : 39424 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: 0 225 226 227 228 229 230 231 238 239 240 241 242 243 252 253 254 255 256
257 258 259 266 267 268 269 270 271
node 0 size: 193530 MB
node 0 free: 193235 MB
node 1 cpus: 1 2 3 4 5 6 7 14 15 16 17 18 19 28 29 30 31 32 33 34 35 42 43 44 45 46 47
224
node 1 size: 192095 MB
node 1 free: 191374 MB
node 2 cpus: 8 9 10 11 12 13 20 21 22 23 24 25 26 27 36 37 38 39 40 41 48 49 50 51 52
53 54 55
node 2 size: 193530 MB
node 2 free: 193072 MB
node 3 cpus: 56 57 58 59 60 61 62 63 70 71 72 73 74 75 84 85 86 87 88 89 90 91 98 99
100 101 102 103
node 3 size: 193530 MB
node 3 free: 193302 MB
node 4 cpus: 64 65 66 67 68 69 76 77 78 79 80 81 82 83 92 93 94 95 96 97 104 105 106
107 108 109 110 111
node 4 size: 193530 MB
node 4 free: 193283 MB
node 5 cpus: 112 113 114 115 116 117 118 119 126 127 128 129 130 131 140 141 142 143
144 145 146 147 154 155 156 157 158 159
node 5 size: 193530 MB
node 5 free: 193301 MB
node 6 cpus: 120 121 122 123 124 125 132 133 134 135 136 137 138 139 148 149 150 151
152 153 160 161 162 163 164 165 166 167
node 6 size: 193530 MB
node 6 free: 193329 MB
node 7 cpus: 168 169 170 171 172 173 174 175 182 183 184 185 186 187 196 197 198 199
```

(Continued on next page)



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Platform Notes (Continued)

```

200 201 202 203 210 211 212 213 214 215
node 7 size: 193530 MB
node 7 free: 193316 MB
node 8 cpus: 176 177 178 179 180 181 188 189 190 191 192 193 194 195 204 205 206 207
208 209 216 217 218 219 220 221 222 223
node 8 size: 193501 MB
node 8 free: 193079 MB
node 9 cpus: 232 233 234 235 236 237 244 245 246 247 248 249 250 251 260 261 262 263
264 265 272 273 274 275 276 277 278 279
node 9 size: 193530 MB
node 9 free: 193289 MB
node 10 cpus: 280 281 282 283 284 285 286 287 294 295 296 297 298 299 308 309 310 311
312 313 314 315 322 323 324 325 326 327
node 10 size: 193530 MB
node 10 free: 193385 MB
node 11 cpus: 288 289 290 291 292 293 300 301 302 303 304 305 306 307 316 317 318 319
320 321 328 329 330 331 332 333 334 335
node 11 size: 193530 MB
node 11 free: 193349 MB
node 12 cpus: 336 337 338 339 340 341 342 343 350 351 352 353 354 355 364 365 366 367
368 369 370 371 378 379 380 381 382 383
node 12 size: 193530 MB
node 12 free: 193349 MB
node 13 cpus: 344 345 346 347 348 349 356 357 358 359 360 361 362 363 372 373 374 375
376 377 384 385 386 387 388 389 390 391
node 13 size: 193530 MB
node 13 free: 193356 MB
node 14 cpus: 392 393 394 395 396 397 398 399 406 407 408 409 410 411 420 421 422 423
424 425 426 427 434 435 436 437 438 439
node 14 size: 193530 MB
node 14 free: 193344 MB
node 15 cpus: 400 401 402 403 404 405 412 413 414 415 416 417 418 419 428 429 430 431
432 433 440 441 442 443 444 445 446 447
node 15 size: 193527 MB
node 15 free: 193362 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
 0:  10 21 21 31 31 31 31 31 31 11 21 21 31 31 21 21
 1:  21 10 11 21 21 21 21 31 31 21 31 31 31 31 31 31
 2:  21 11 10 21 21 21 21 31 31 21 31 31 31 31 31 31
 3:  31 21 21 10 11 31 31 21 21 31 21 21 31 31 31 31
 4:  31 21 21 11 10 31 31 21 21 31 21 21 31 31 31 31
 5:  31 21 21 31 31 10 11 21 21 31 31 31 21 21 31 31
 6:  31 21 21 31 31 11 10 21 21 31 31 31 21 21 31 31
 7:  31 31 31 21 21 21 21 10 11 31 31 31 31 31 21 21
 8:  31 31 31 21 21 21 21 11 10 31 31 31 31 31 21 21
 9:  11 21 21 31 31 31 31 31 31 10 21 21 31 31 21 21

```

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Platform Notes (Continued)

10:	21	31	31	21	21	31	31	31	31	21	10	11	21	21	31	31
11:	21	31	31	21	21	31	31	31	31	21	11	10	21	21	31	31
12:	31	31	31	31	31	21	21	31	31	31	21	21	10	11	21	21
13:	31	31	31	31	31	21	21	31	31	31	21	21	11	10	21	21
14:	21	31	31	31	31	31	31	21	21	21	31	31	21	21	10	11
15:	21	31	31	31	31	31	31	21	21	21	31	31	21	21	11	10

From /proc/meminfo

MemTotal: 3169303840 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d

SUSE Linux Enterprise Server 12 SP4

From /etc/*release* /etc/*version*

SuSE-release:

SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 4

This file is deprecated and will be removed in a future service pack or release.
Please check /etc/os-release for details about this release.

os-release:

NAME="SLES"
VERSION="12-SP4"
VERSION_ID="12.4"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:

Linux linux 4.12.14-94.41-default #1 SMP Wed Oct 31 12:25:04 UTC 2018 (3090901) 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: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Mar 15 11:02 last=5

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda3	xfs	1.8T	162G	1.6T	10%	/home

(Continued on next page)



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Platform Notes (Continued)

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 American Megatrends Inc. 3.0a 02/15/2019

Memory:

96x Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2934

(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.
=====

Base Compiler Invocation

C benchmarks:

icc -m64 -std=c11

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Base Compiler Invocation (Continued)

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

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



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

<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SKL-revD.html>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.html>

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

<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SKL-revD.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.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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