SPEC® CPU2017 Integer Rate Result

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Huawei

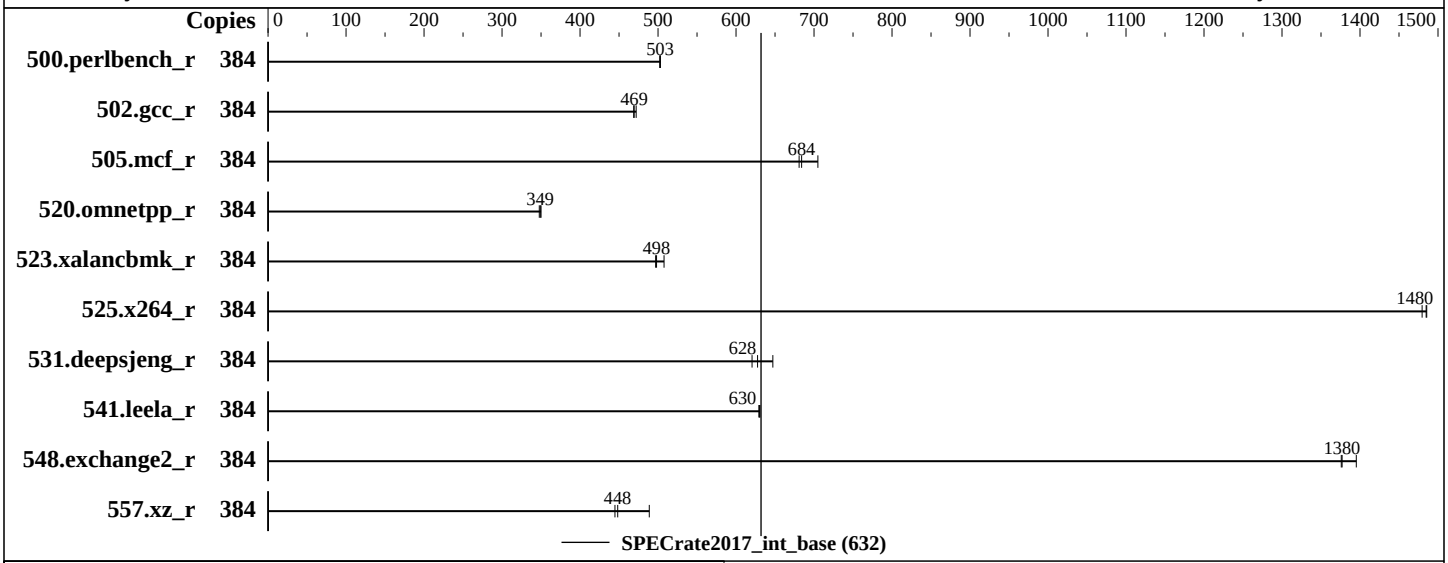
KunLun 9008 (Intel Xeon E7-8890 v4)

SPECrate2017_int_base = 632

SPECrate2017_int_peak = Not Run

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Test Date: May-2018
Hardware Availability: Mar-2018
Software Availability: Mar-2018



Hardware

CPU Name:	Intel Xeon E7-8890 v4
Max MHz.:	3400
Nominal:	2200
Enabled:	192 cores, 8 chips, 2 threads/core
Orderable:	4,8 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	256 KB I+D on chip per core
L3:	60 MB I+D on chip per chip
Other:	None
Memory:	2 TB (64 x 32 GB 2Rx4 PC4-2400T-R, running at 1333)
Storage:	3 x 900 GB SAS HDD 10K RPM, RAID 0
Other:	None

Software

OS:	SUSE Linux Enterprise Server 12 SP2 4.4.120-92.70-default
Compiler:	C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
Parallel:	No
Firmware:	Version BLXSV320 released Feb-2018
File System:	ext4
System State:	Run level 5 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	jemalloc: jemalloc memory allocator library V5.0.1

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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	1216	503	**1216**	**503**	1217	502							
502.gcc_r	384	1152	472	**1159**	**469**	1160	469							
505.mcf_r	384	880	705	911	681	**907**	**684**							
520.omnetpp_r	384	**1443**	**349**	1439	350	1449	348							
523.xalancbmk_r	384	799	508	816	497	**814**	**498**							
525.x264_r	384	454	1480	453	1490	**453**	**1480**							
531.deepsjeng_r	384	680	647	709	621	**701**	**628**							
541.leela_r	384	1011	629	1008	631	**1009**	**630**							
548.exchange2_r	384	721	1400	731	1380	**731**	**1380**							
557.xz_r	384	848	489	**925**	**448**	932	445							

SPECrate2017_int_base = 632

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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"
Numa balancing was disabled using "echo 0 > /proc/sys/kernel/numa_balancing"
```

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 i7-4790 CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.4
 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>

jemalloc: configured and built at default for
32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4,
```

(Continued on next page)

General Notes (Continued)

```
and the system compiler gcc 4.8.5;
jemalloc: sources avilable from jemalloc.net or
https://github.com/jemalloc/jemalloc/releases;
Yes: 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.
```

Platform Notes

```
 BIOS configuration:
 Set Power Efficiency Mode to Performance
 Memory Patrol Scrub set to Disable
 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on linux-i5c0 Sat Jun 30 11:32:55 2018

 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) CPU E7-8890 v4 @ 2.20GHz
       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 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
       physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
       physical 2: cores 0 1 2 3 4 5 8 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 8 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 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
       physical 5: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
       physical 6: cores 0 1 2 3 4 5 8 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 8 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):          8
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 79
      Model name:            Intel(R) Xeon(R) CPU E7-8890 v4 @ 2.20GHz
      Stepping:              1
      CPU MHz:               2200.526
      CPU max MHz:           3400.0000
      CPU min MHz:           1200.0000
      BogoMIPS:              4400.06
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              256K
      L3 cache:              61440K
      NUMA node0 CPU(s):     0-23,192-215
      NUMA node1 CPU(s):     24-47,216-239
      NUMA node2 CPU(s):     48-71,240-263
      NUMA node3 CPU(s):     72-95,264-287
      NUMA node4 CPU(s):     96-119,288-311
      NUMA node5 CPU(s):     120-143,312-335
      NUMA node6 CPU(s):     144-167,336-359
      NUMA node7 CPU(s):     168-191,360-383
      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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf
      eagerfpu mce_recovery 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 arat epb invpcid_single pln pts
      dtherm intel_pt spec_ctrl stibp retpoline kaiser tpr_shadow vnmi flexpriority ept
      vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdseed adx
      smap xsaveopt cqm_llc cqm_occup_llc

  /proc/cpuinfo cache data
     cache size : 61440 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 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 192 193 194
    195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215
    node 0 size: 257400 MB
    node 0 free: 256766 MB
    node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
```

(Continued on next page)

Platform Notes (Continued)

```
   216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237
   238 239
   node 1 size: 258001 MB
   node 1 free: 257574 MB
   node 2 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
   240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261
   262 263
   node 2 size: 258001 MB
   node 2 free: 257675 MB
   node 3 cpus: 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
   264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285
   286 287
   node 3 size: 258001 MB
   node 3 free: 257573 MB
   node 4 cpus: 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114
   115 116 117 118 119 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304
   305 306 307 308 309 310 311
   node 4 size: 258001 MB
   node 4 free: 257716 MB
   node 5 cpus: 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137
   138 139 140 141 142 143 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327
   328 329 330 331 332 333 334 335
   node 5 size: 258001 MB
   node 5 free: 257741 MB
   node 6 cpus: 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161
   162 163 164 165 166 167 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351
   352 353 354 355 356 357 358 359
   node 6 size: 258001 MB
   node 6 free: 257771 MB
   node 7 cpus: 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185
   186 187 188 189 190 191 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375
   376 377 378 379 380 381 382 383
   node 7 size: 257833 MB
   node 7 free: 257576 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  21  31  21  41  41  51  51
     1:  21  10  21  31  41  41  51  51
     2:  31  21  10  21  51  51  41  41
     3:  21  31  21  10  51  51  41  41
     4:  41  41  51  51  10  21  31  21
     5:  41  41  51  51  21  10  21  31
     6:  51  51  41  41  31  21  10  21
     7:  51  51  41  41  21  31  21  10

 From /proc/meminfo
    MemTotal:       2112758448 kB
```


(Continued on next page)

Platform Notes (Continued)

```
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 /usr/bin/lsb_release -d
    SUSE Linux Enterprise Server 12 SP2

 From /etc/*release* /etc/*version*
    SuSE-release:
       SUSE Linux Enterprise Server 12 (x86_64)
       VERSION = 12
       PATCHLEVEL = 2
       # 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-SP2"
       VERSION_ID="12.2"
       PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
       ID="sles"
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/o:suse:sles:12:sp2"

 uname -a:
    Linux linux-i5c0 4.4.120-92.70-default #1 SMP Wed Mar 14 15:59:43 UTC 2018 (52a83de)
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 5 Jun 30 11:30

 SPEC is set to: /home/cpu2017
    Filesystem     Type   Size  Used Avail Use% Mounted on
    /dev/sda4      btrfs  2.4T  207G  2.2T   9% /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 American Megatrends Inc. BLXSV320 2/23/2018
   Memory:
    49x Hynix HMA84GR7MFR4N-UH 32 GB 2 rank 2400, configured at 1333
    9x Micron 36ASF4G72PZ-2G3B1 32 GB 2 rank 2400, configured at 1333
    128x NO DIMM NO DIMM
    6x Samsung M393A4K40BB1-CRC 32 GB 2 rank 2400, configured at 1333

 (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)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 FC  548.exchange2_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 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

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Base Portability Flags (Continued)

541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

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.html
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-V1.2-BDW-RevG.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.xml
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-V1.2-BDW-RevG.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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