SPEC® CPU2017 Integer Rate Result

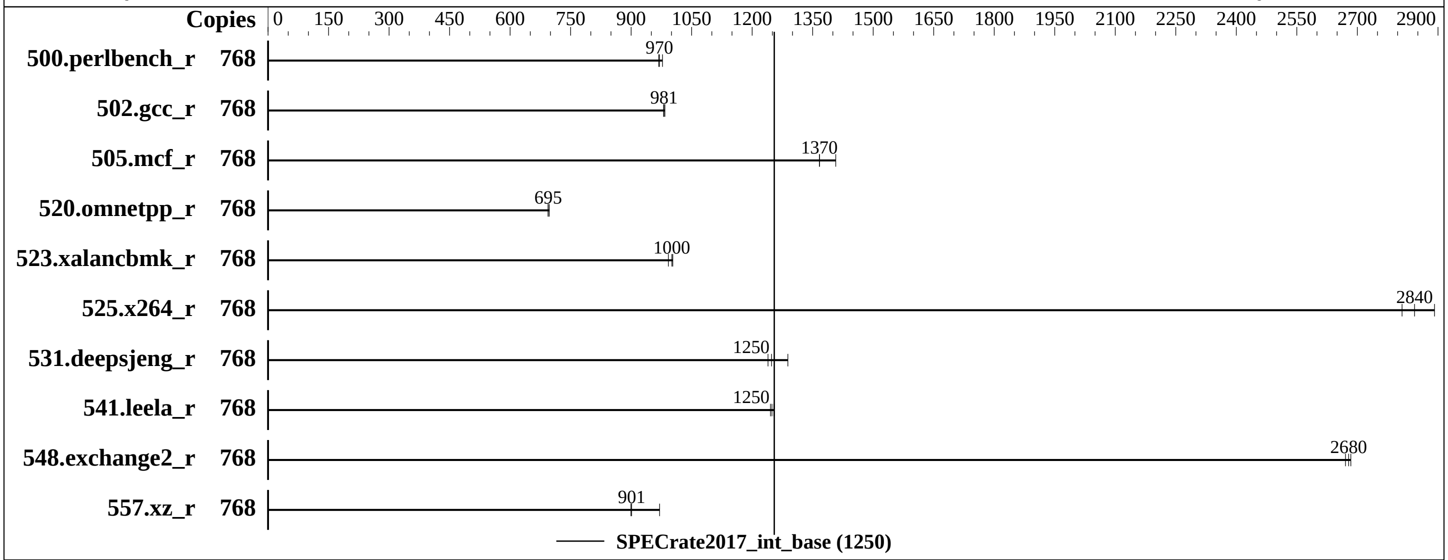
Huawei

KunLun 9016 (Intel Xeon E7-8890 v4)

SPECrate2017_int_base = 1250

SPECrate2017_int_peak = Not Run

CPU2017 License:	3175	**Test Date:**	May-2018
Test Sponsor:	Huawei	**Hardware Availability:**	Mar-2018
Tested by:	Huawei	**Software Availability:**	Mar-2018



Hardware

CPU Name:	Intel Xeon E7-8890 v4
Max MHz.:	3400
Nominal:	2200
Enabled:	384 cores, 16 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:	4 TB (128 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

	Base							Peak						
Benchmark	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	768	1251	978	**1260**	**970**	1262	968							
502.gcc_r	768	1109	980	**1108**	**981**	1106	984							
505.mcf_r	768	882	1410	908	1370	**908**	**1370**							
520.omnetpp_r	768	**1451**	**695**	1445	697	1452	694							
523.xalancbmk_r	768	808	1000	**810**	**1000**	817	992							
525.x264_r	768	**473**	**2840**	465	2890	478	2810							
531.deepsjeng_r	768	683	1290	**705**	**1250**	710	1240							
541.leela_r	768	**1018**	**1250**	1014	1250	1021	1250							
548.exchange2_r	768	753	2670	**751**	**2680**	750	2680							
557.xz_r	768	855	971	922	899	**920**	**901**							

SPECrate2017_int_base = 1250

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"
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,
```

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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 Thu Jun 28 21:24:11 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
      16  "physical id"s (chips)
      768 "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
      physical 8: 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 9: 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 10: 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 11: 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 12: 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 13: 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 14: 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
```

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Platform Notes (Continued)

```
    physical 15: 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):                768
     On-line CPU(s) list:   0-767
     Thread(s) per core:    2
     Core(s) per socket:    24
     Socket(s):             16
     NUMA node(s):          16
     Vendor ID:             GenuineIntel
     CPU family:            6
     Model:                 79
     Model name:            Intel(R) Xeon(R) CPU E7-8890 v4 @ 2.20GHz
     Stepping:              1
     CPU MHz:               2200.024
     CPU max MHz:           3400.0000
     CPU min MHz:           1200.0000
     BogoMIPS:              4399.79
     Virtualization:        VT-x
     L1d cache:             32K
     L1i cache:             32K
     L2 cache:              256K
     L3 cache:              61440K
     NUMA node0 CPU(s):     0-23,384-407
     NUMA node1 CPU(s):     24-47,408-431
     NUMA node2 CPU(s):     48-71,432-455
     NUMA node3 CPU(s):     72-95,456-479
     NUMA node4 CPU(s):     96-119,480-503
     NUMA node5 CPU(s):     120-143,504-527
     NUMA node6 CPU(s):     144-167,528-551
     NUMA node7 CPU(s):     168-191,552-575
     NUMA node8 CPU(s):     192-215,576-599
     NUMA node9 CPU(s):     216-239,600-623
     NUMA node10 CPU(s):    240-263,624-647
     NUMA node11 CPU(s):    264-287,648-671
     NUMA node12 CPU(s):    288-311,672-695
     NUMA node13 CPU(s):    312-335,696-719
     NUMA node14 CPU(s):    336-359,720-743
     NUMA node15 CPU(s):    360-383,744-767
     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
```

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Platform Notes (Continued)

```
      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: 16 nodes (0-15)
   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 23 384 385 386
   387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407
   node 0 size: 257423 MB
   node 0 free: 256907 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
   408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429
   430 431
   node 1 size: 258024 MB
   node 1 free: 257733 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
   432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453
   454 455
   node 2 size: 258024 MB
   node 2 free: 257792 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
   456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477
   478 479
   node 3 size: 258024 MB
   node 3 free: 257720 MB
   node 4 cpus: 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114
   115 116 117 118 119 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496
   497 498 499 500 501 502 503
   node 4 size: 258024 MB
   node 4 free: 257658 MB
   node 5 cpus: 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137
   138 139 140 141 142 143 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519
   520 521 522 523 524 525 526 527
   node 5 size: 258024 MB
   node 5 free: 257732 MB
   node 6 cpus: 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161
   162 163 164 165 166 167 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543
   544 545 546 547 548 549 550 551
   node 6 size: 258024 MB
   node 6 free: 257733 MB
   node 7 cpus: 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185
   186 187 188 189 190 191 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567
```

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Platform Notes (Continued)

```
568 569 570 571 572 573 574 575
node 7 size: 258024 MB
node 7 free: 257690 MB
node 8 cpus: 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209
210 211 212 213 214 215 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591
592 593 594 595 596 597 598 599
node 8 size: 258024 MB
node 8 free: 257870 MB
node 9 cpus: 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233
234 235 236 237 238 239 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615
616 617 618 619 620 621 622 623
node 9 size: 258024 MB
node 9 free: 257874 MB
node 10 cpus: 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257
258 259 260 261 262 263 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639
640 641 642 643 644 645 646 647
node 10 size: 258024 MB
node 10 free: 257869 MB
node 11 cpus: 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281
282 283 284 285 286 287 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663
664 665 666 667 668 669 670 671
node 11 size: 258024 MB
node 11 free: 257875 MB
node 12 cpus: 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305
306 307 308 309 310 311 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687
688 689 690 691 692 693 694 695
node 12 size: 258024 MB
node 12 free: 257799 MB
node 13 cpus: 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329
330 331 332 333 334 335 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711
712 713 714 715 716 717 718 719
node 13 size: 258024 MB
node 13 free: 257794 MB
node 14 cpus: 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353
354 355 356 357 358 359 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735
736 737 738 739 740 741 742 743
node 14 size: 258024 MB
node 14 free: 257770 MB
node 15 cpus: 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377
378 379 380 381 382 383 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759
760 761 762 763 764 765 766 767
node 15 size: 257856 MB
node 15 free: 257644 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
  0:  10  21  31  21  41  41  51  51  61  61  71  71  61  61  71  71
  1:  21  10  21  31  41  41  51  51  61  61  71  71  61  61  71  71
```

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Platform Notes (Continued)

```
    2:  31  21  10  21  51  51  41  41  71  71  61  61  71  71  61  61
    3:  21  31  21  10  51  51  41  41  71  71  61  61  71  71  61  61
    4:  41  41  51  51  10  21  31  21  61  61  71  71  61  61  71  71
    5:  41  41  51  51  21  10  21  31  61  61  71  71  61  61  71  71
    6:  51  51  41  41  31  21  10  21  71  71  61  61  71  71  61  61
    7:  51  51  41  41  21  31  21  10  71  71  61  61  71  71  61  61
    8:  61  61  71  71  61  61  71  71  10  21  31  21  41  41  51  51
    9:  61  61  71  71  61  61  71  71  21  10  21  31  41  41  51  51
   10:  71  71  61  61  71  71  61  61  31  21  10  21  51  51  41  41
   11:  71  71  61  61  71  71  61  61  21  31  21  10  51  51  41  41
   12:  61  61  71  71  61  61  71  71  41  41  51  51  10  21  31  21
   13:  61  61  71  71  61  61  71  71  41  41  51  51  21  10  21  31
   14:  71  71  61  61  71  71  61  61  51  51  41  41  31  21  10  21
   15:  71  71  61  61  71  71  61  61  51  51  41  41  21  31  21  10

From /proc/meminfo
   MemTotal:       4226684040 kB
   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 28 21:16

SPEC is set to: /home/cpu2017
   Filesystem     Type   Size  Used Avail Use% Mounted on
```

(Continued on next page)

Platform Notes (Continued)

```
   /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:
    70x Hynix HMA84GR7MFR4N-UH 32 GB 2 rank 2400, configured at 1333
    15x Micron 36ASF4G72PZ-2G3B1 32 GB 2 rank 2400, configured at 1333
    256x NO DIMM NO DIMM
    43x 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

(Continued on next page)

Base Compiler Invocation (Continued)

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
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

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Base Other Flags (Continued)

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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