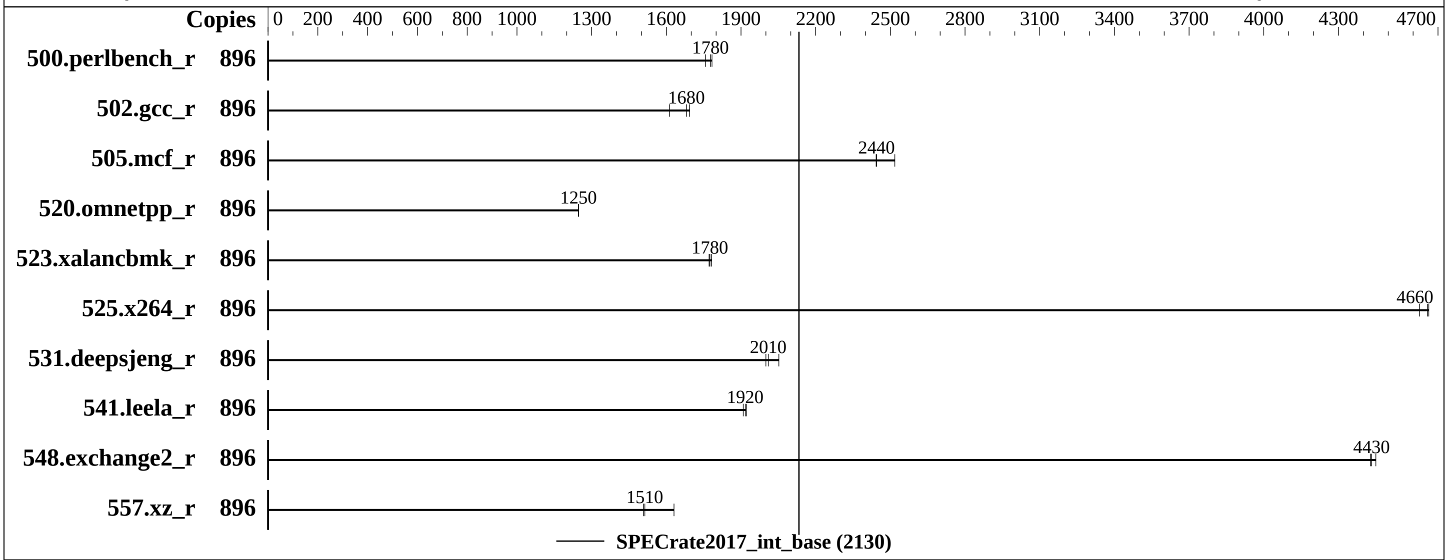
SPEC® CPU2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Superdome Flex
(2.50 GHz, Intel Xeon Platinum 8180)

SPECrate2017_int_base = 2130

SPECrate2017_int_peak = Not Run

CPU2017 License:	3	**Test Date:**	Dec-2017
Test Sponsor:	HPE	**Hardware Availability:**	Mar-2018
Tested by:	HPE	**Software Availability:**	Mar-2018



Hardware

CPU Name:	Intel Xeon Platinum 8180
Max MHz.:	3800
Nominal:	2500
Enabled:	448 cores, 16 chips, 2 threads/core
Orderable:	4 to 32 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:	6 TB (192 x 32 GB 2Rx4 PC4-2666V-R)
Storage:	6 TB tmpfs
Other:	None

Software

OS:	SUSE Linux Enterprise Server 12 (x86_64) SP3, Kernel 4.4.92-6.30-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:	HPE Firmware Bundle Version 2.3.110 released Dec-2017
File System:	tmpfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	jemalloc: jemalloc memory allocator library V5.0.1; jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets; jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5; jemalloc: sources available from jemalloc.net or releases HPE Foundation Software 1.0, Build 717a130.sles12sp3-1710052000

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	896	800	1780	**802**	**1780**	812	1760							
502.gcc_r	896	787	1610	749	1690	**755**	**1680**							
505.mcf_r	896	575	2520	**592**	**2440**	593	2440							
520.omnetpp_r	896	**942**	**1250**	942	1250	943	1250							
523.xalancbmk_r	896	531	1780	**533**	**1780**	534	1770							
525.x264_r	896	**337**	**4660**	339	4630	336	4660							
531.deepsjeng_r	896	500	2050	**511**	**2010**	513	2000							
541.leela_r	896	772	1920	777	1910	**774**	**1920**							
548.exchange2_r	896	530	4430	**530**	**4430**	527	4450							
557.xz_r	896	593	1630	641	1510	**639**	**1510**							

SPECrate2017_int_base = 2130

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"
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3>       /proc/sys/vm/drop_caches
The tmpfs filesystem was set up with:
   mkdir -p /dev/shm/cpu2017-16S
   mount -t tmpfs -o size=6144G,rw tmpfs /dev/shm/cpu2017-16S
```

General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/dev/shm/cpu2017-16S/lib/ia32:/dev/shm/cpu2017-16S/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/dev/shm/cpu2017-16S/je5.0.1-32:/dev/shm/cpu2017-16S/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
```

Platform Notes

```
Rack Management Controller setting:
   modify npar pnum=0 ras=hpc

Sysinfo program /dev/shm/cpu2017-16S/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on uv4test40-sys Mon Dec 18 17:08:51 2017

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 8180 CPU @ 2.50GHz
      16  "physical id"s (chips)
      896 "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
      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
      physical 8: 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 9: 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 10: 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 11: 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 12: 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 13: 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 14: 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 15: 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):                896
      On-line CPU(s) list:   0-895
      Thread(s) per core:    2
      Core(s) per socket:    28
      Socket(s):             16
      NUMA node(s):          16
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Platinum 8180 CPU @ 2.50GHz
      Stepping:              4
      CPU MHz:               3800.000
      CPU max MHz:           3800.0000
      CPU min MHz:           1000.0000
      BogoMIPS:              5000.46
      Virtualization:        VT-x
      NUMA node0 CPU(s):     0-27,448-475
      NUMA node1 CPU(s):     28-55,476-503
      NUMA node2 CPU(s):     56-83,504-531
      NUMA node3 CPU(s):     84-111,532-559
      NUMA node4 CPU(s):     112-139,560-587
      NUMA node5 CPU(s):     140-167,588-615
      NUMA node6 CPU(s):     168-195,616-643
      NUMA node7 CPU(s):     196-223,644-671
      NUMA node8 CPU(s):     224-251,672-699
      NUMA node9 CPU(s):     252-279,700-727
      NUMA node10 CPU(s):    280-307,728-755
      NUMA node11 CPU(s):    308-335,756-783
      NUMA node12 CPU(s):    336-363,784-811
      NUMA node13 CPU(s):    364-391,812-839
      NUMA node14 CPU(s):    392-419,840-867
      NUMA node15 CPU(s):    420-447,868-895
      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
      aperfmperf eagerfpu 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 ida arat epb pln pts dtherm intel_pt
```

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Platform Notes (Continued)

```
      tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
      erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd
      avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc pku ospke

 /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 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
   448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469
   470 471 472 473 474 475
   node 0 size: 372922 MB
   node 0 free: 372244 MB
   node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
   53 54 55 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494
   495 496 497 498 499 500 501 502 503
   node 1 size: 375250 MB
   node 1 free: 374313 MB
   node 2 cpus: 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
   81 82 83 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522
   523 524 525 526 527 528 529 530 531
   node 2 size: 375250 MB
   node 2 free: 374679 MB
   node 3 cpus: 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105
   106 107 108 109 110 111 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547
   548 549 550 551 552 553 554 555 556 557 558 559
   node 3 size: 375250 MB
   node 3 free: 374359 MB
   node 4 cpus: 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129
   130 131 132 133 134 135 136 137 138 139 560 561 562 563 564 565 566 567 568 569 570 571
   572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587
   node 4 size: 375250 MB
   node 4 free: 374719 MB
   node 5 cpus: 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157
   158 159 160 161 162 163 164 165 166 167 588 589 590 591 592 593 594 595 596 597 598 599
   600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615
   node 5 size: 375250 MB
   node 5 free: 374715 MB
   node 6 cpus: 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185
   186 187 188 189 190 191 192 193 194 195 616 617 618 619 620 621 622 623 624 625 626 627
   628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643
   node 6 size: 375250 MB
   node 6 free: 374719 MB
   node 7 cpus: 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213
   214 215 216 217 218 219 220 221 222 223 644 645 646 647 648 649 650 651 652 653 654 655
```

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Platform Notes (Continued)

```
656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671
node 7 size: 375250 MB
node 7 free: 374712 MB
node 8 cpus: 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241
242 243 244 245 246 247 248 249 250 251 672 673 674 675 676 677 678 679 680 681 682 683
684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699
node 8 size: 375250 MB
node 8 free: 374721 MB
node 9 cpus: 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269
270 271 272 273 274 275 276 277 278 279 700 701 702 703 704 705 706 707 708 709 710 711
712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727
node 9 size: 375250 MB
node 9 free: 374707 MB
node 10 cpus: 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297
298 299 300 301 302 303 304 305 306 307 728 729 730 731 732 733 734 735 736 737 738 739
740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755
node 10 size: 375250 MB
node 10 free: 374720 MB
node 11 cpus: 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325
326 327 328 329 330 331 332 333 334 335 756 757 758 759 760 761 762 763 764 765 766 767
768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783
node 11 size: 375250 MB
node 11 free: 374707 MB
node 12 cpus: 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353
354 355 356 357 358 359 360 361 362 363 784 785 786 787 788 789 790 791 792 793 794 795
796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811
node 12 size: 375250 MB
node 12 free: 374546 MB
node 13 cpus: 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381
382 383 384 385 386 387 388 389 390 391 812 813 814 815 816 817 818 819 820 821 822 823
824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839
node 13 size: 375250 MB
node 13 free: 374403 MB
node 14 cpus: 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409
410 411 412 413 414 415 416 417 418 419 840 841 842 843 844 845 846 847 848 849 850 851
852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867
node 14 size: 375250 MB
node 14 free: 374517 MB
node 15 cpus: 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437
438 439 440 441 442 443 444 445 446 447 868 869 870 871 872 873 874 875 876 877 878 879
880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895
node 15 size: 375241 MB
node 15 free: 374493 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
  0:  10  16  16  24  43  43  43  43  43  43  43  43  43  43  43  43
  1:  16  10  24  16  43  43  43  43  43  43  43  43  43  43  43  43
```

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Platform Notes (Continued)

```
      2:  16  24  10  16  43  43  43  43  43  43  43  43  43  43  43  43
      3:  24  16  16  10  43  43  43  43  43  43  43  43  43  43  43  43
      4:  43  43  43  43  10  16  16  24  43  43  43  43  43  43  43  43
      5:  43  43  43  43  16  10  24  16  43  43  43  43  43  43  43  43
      6:  43  43  43  43  16  24  10  16  43  43  43  43  43  43  43  43
      7:  43  43  43  43  24  16  16  10  43  43  43  43  43  43  43  43
      8:  43  43  43  43  43  43  43  43  10  16  16  24  43  43  43  43
      9:  43  43  43  43  43  43  43  43  16  10  24  16  43  43  43  43
     10:  43  43  43  43  43  43  43  43  16  24  10  16  43  43  43  43
     11:  43  43  43  43  43  43  43  43  24  16  16  10  43  43  43  43
     12:  43  43  43  43  43  43  43  43  43  43  43  43  10  16  16  24
     13:  43  43  43  43  43  43  43  43  43  43  43  43  16  10  24  16
     14:  43  43  43  43  43  43  43  43  43  43  43  43  16  24  10  16
     15:  43  43  43  43  43  43  43  43  43  43  43  43  24  16  16  10

 From /proc/meminfo
    MemTotal:       6145710096 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 /usr/bin/lsb_release -d
    SUSE Linux Enterprise Server 12 SP3

 From /etc/*release* /etc/*version*
    SuSE-release:
       SUSE Linux Enterprise Server 12 (x86_64)
       VERSION = 12
       PATCHLEVEL = 3
       # 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.
    hpe-foundation-release: HPE Foundation Software 1.0, Build
    717a130.sles12sp3-1710052000
    os-release:
       NAME="SLES"
       VERSION="12-SP3"
       VERSION_ID="12.3"
       PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
       ID="sles"
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/o:suse:sles:12:sp3"

 uname -a:
    Linux uv4test40-sys 4.4.92-6.30-default #1 SMP Mon Dec 4 08:08:30 UTC 2017 (1fb0e00)
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Dec 17 01:00
```

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Platform Notes (Continued)

```
 SPEC is set to: /dev/shm/cpu2017-16S
    Filesystem     Type   Size  Used Avail Use% Mounted on
    tmpfs          tmpfs  6.0T  3.3G  6.0T   1% /dev/shm/cpu2017-16S

 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 HPE IP147.006.000.143.000.1712051837 12/05/2017
   Memory:
    192x Hynix HMA84GR7AFR4N-VK 32 GB 2 rank 2666

 (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

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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/HPE-Superdome_Flex-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.xml
http://www.spec.org/cpu2017/flags/HPE-Superdome_Flex-RevA.xml

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

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