SPEC CPU®2017 Integer Rate Result

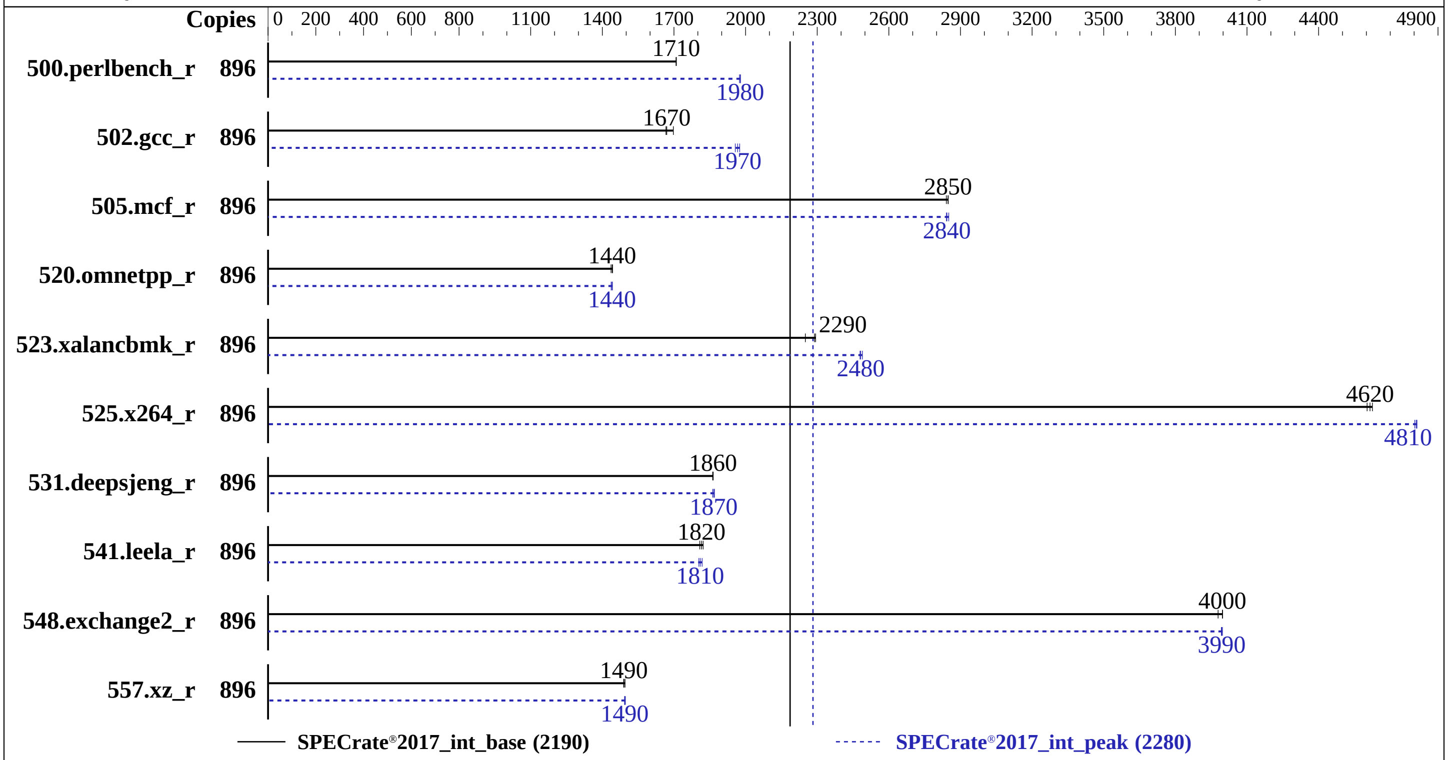
ATOS

BullSequana S1600 (Intel Xeon Platinum 8276M)

SPECrate®2017_int_base = 2190

SPECrate®2017_int_peak = 2280

CPU2017 License:	20	**Test Date:**	Sep-2019
Test Sponsor:	ATOS	**Hardware Availability:**	Jun-2019
Tested by:	ATOS	**Software Availability:**	Dec-2018



Hardware

CPU Name:	Intel Xeon Platinum 8276M
Max MHz:	4000
Nominal:	2200
Enabled:	448 cores, 16 chips, 2 threads/core
Orderable:	2,4,8,16 chip
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:	1.3 TB tmpfs
Other:	1 x 400 GB SATA disk

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:	Version LC_UNC_CCL042.34.00.125 released Apr-2019
File System:	tmpfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other:	None jemalloc memory allocator V5.0.1
Power Management:	--

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	896	835	1710	834	1710	**834**	**1710**	896	722	1970	721	1980	**721**	**1980**
502.gcc_r	896	**760**	**1670**	761	1670	747	1700	896	**645**	**1970**	642	1980	648	1960
505.mcf_r	896	510	2840	508	2850	**508**	**2850**	896	508	2850	**509**	**2840**	510	2840
520.omnetpp_r	896	815	1440	818	1440	**816**	**1440**	896	**816**	**1440**	815	1440	818	1440
523.xalancbmk_r	896	**413**	**2290**	420	2250	413	2290	896	382	2480	**381**	**2480**	380	2490
525.x264_r	896	339	4630	**340**	**4620**	341	4600	896	327	4800	326	4810	**326**	**4810**
531.deepsjeng_r	896	551	1860	551	1860	**551**	**1860**	896	549	1870	**550**	**1870**	551	1860
541.leela_r	896	**817**	**1820**	814	1820	821	1810	896	**820**	**1810**	822	1800	816	1820
548.exchange2_r	896	590	3980	**587**	**4000**	587	4000	896	**588**	**3990**	587	4000	588	3990
557.xz_r	896	647	1500	650	1490	**649**	**1490**	896	**648**	**1490**	648	1490	647	1500

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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

```
SPEC files placed in /specRam, with /specRam
mounted as tmpfs with mpol=interleave, size=1325G
 Tmpfs filesystem can be set with:
     mount -t tmpfs -o size=1325g tmpfs /specRam
 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 = "/specRam/lib/ia32:/specRam/lib/intel64:/specRam/je5.0.1-32:/specRam/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>
 NA: 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.
 Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a)
 is mitigated in the system as tested and documented.
 Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4)
 is mitigated in the system as tested and documented.
 jemalloc, a general purpose malloc implementation
 built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS configuration:
DCU Streamer Prefetcher set to Disable
Patrol Scrub set to Disable
 Sysinfo program /specRam/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-rsoz Tue Sep 17 17:04:39 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 8276M CPU @ 2.20GHz
       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
```

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Platform Notes (Continued)

```
        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
        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 8276M CPU @ 2.20GHz
      Stepping:              7
      CPU MHz:               2200.000
      CPU max MHz:           4000.0000
      CPU min MHz:           1000.0000
      BogoMIPS:              4400.00
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              39424K
      NUMA node0 CPU(s):     0-27,448-475
      NUMA node1 CPU(s):     28-55,476-503
```

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CPU2017 License: 20
Test Sponsor: ATOS
Tested by: ATOS

Test Date: Sep-2019
Hardware Availability: Jun-2019
Software Availability: Dec-2018

Platform Notes (Continued)

```
     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 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 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 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: 385764 MB
   node 0 free: 384798 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: 387061 MB
   node 1 free: 385668 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: 387061 MB
```

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Platform Notes (Continued)

```
node 2 free: 386503 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: 387061 MB
node 3 free: 386501 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: 387061 MB
node 4 free: 386471 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: 387061 MB
node 5 free: 386507 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: 387061 MB
node 6 free: 386423 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
656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671
node 7 size: 387061 MB
node 7 free: 386446 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: 387061 MB
node 8 free: 386377 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: 387061 MB
node 9 free: 386410 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: 387061 MB
node 10 free: 386403 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: 387032 MB
node 11 free: 386461 MB
node 12 cpus: 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353
```

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Platform Notes (Continued)

```
    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: 387061 MB
    node 12 free: 386485 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: 387061 MB
    node 13 free: 386511 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: 387061 MB
    node 14 free: 386426 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: 387056 MB
    node 15 free: 386453 MB
    node distances:
    node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
      0:  10  15  40  40  40  40  40  40  40  40  40  40  40  40  40  40
      1:  15  10  40  40  40  40  40  40  40  40  40  40  40  40  40  40
      2:  40  40  10  15  40  40  40  40  40  40  40  40  40  40  40  40
      3:  40  40  15  10  40  40  40  40  40  40  40  40  40  40  40  40
      4:  40  40  40  40  10  15  40  40  40  40  40  40  40  40  40  40
      5:  40  40  40  40  15  10  40  40  40  40  40  40  40  40  40  40
      6:  40  40  40  40  40  40  10  15  40  40  40  40  40  40  40  40
      7:  40  40  40  40  40  40  15  10  40  40  40  40  40  40  40  40
      8:  40  40  40  40  40  40  40  40  10  15  40  40  40  40  40  40
      9:  40  40  40  40  40  40  40  40  15  10  40  40  40  40  40  40
     10:  40  40  40  40  40  40  40  40  40  40  10  15  40  40  40  40
     11:  40  40  40  40  40  40  40  40  40  40  15  10  40  40  40  40
     12:  40  40  40  40  40  40  40  40  40  40  40  40  10  15  40  40
     13:  40  40  40  40  40  40  40  40  40  40  40  40  15  10  40  40
     14:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  10  15
     15:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  15  10

 From /proc/meminfo
    MemTotal:       6340250336 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 /usr/bin/lsb_release -d
    SUSE Linux Enterprise Server 12 SP4

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

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Platform Notes (Continued)

```
   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-rsoz 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 Sep 17 16:31

SPEC is set to: /specRam
   Filesystem     Type   Size  Used Avail Use% Mounted on
   none           tmpfs  1.3T  4.0G  1.3T   1% /specRam

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 BULL LC_UNC_CCL042.34.00.125 04/29/2019
  Memory:
   192x Samsung M393A4K40CB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 502.gcc_r(peak)
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version
  19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
        | 525.x264_r(base, peak) 557.xz_r(base, peak)
------------------------------------------------------------------------------
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.
------------------------------------------------------------------------------

==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version
  19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
        | 525.x264_r(base, peak) 557.xz_r(base, peak)
------------------------------------------------------------------------------
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.
------------------------------------------------------------------------------

==============================================================================
C++     | 523.xalancbmk_r(peak)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version
  19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
        | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
------------------------------------------------------------------------------
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.
```

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Compiler Version Notes (Continued)

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

==============================================================================
C++     | 523.xalancbmk_r(peak)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version
  19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
        | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
------------------------------------------------------------------------------
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.
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------
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`

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`

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Base Portability Flags (Continued)

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
```

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc -m64 -std=c11
```

502.gcc_r: `icc -m32 -std=c11 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/ia32_lin`

C++ benchmarks (except as noted below):
```
icpc -m64
```

523.xalancbmk_r: `icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/ia32_lin`

Fortran benchmarks:
```
ifort -m64
```

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -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

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

502.gcc_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: -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

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -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

(Continued on next page)

Peak Optimization Flags (Continued)

523.xalancbmk_r: `-Wl,-z,muldefs -prof-gen`(pass 1) `-prof-use`(pass 2) `-ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4 -L/usr/local/je5.0.1-32/lib -ljemalloc`

531.deepsjeng_r: `Same as 520.omnetpp_r`

541.leela_r: `Same as 520.omnetpp_r`

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/Bull-BullionS-Flags-V2.2.html
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Bull-BullionS-Flags-V2.2.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.xml

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