SPEC CPU®2017 Floating Point Rate Result

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ScaleMP

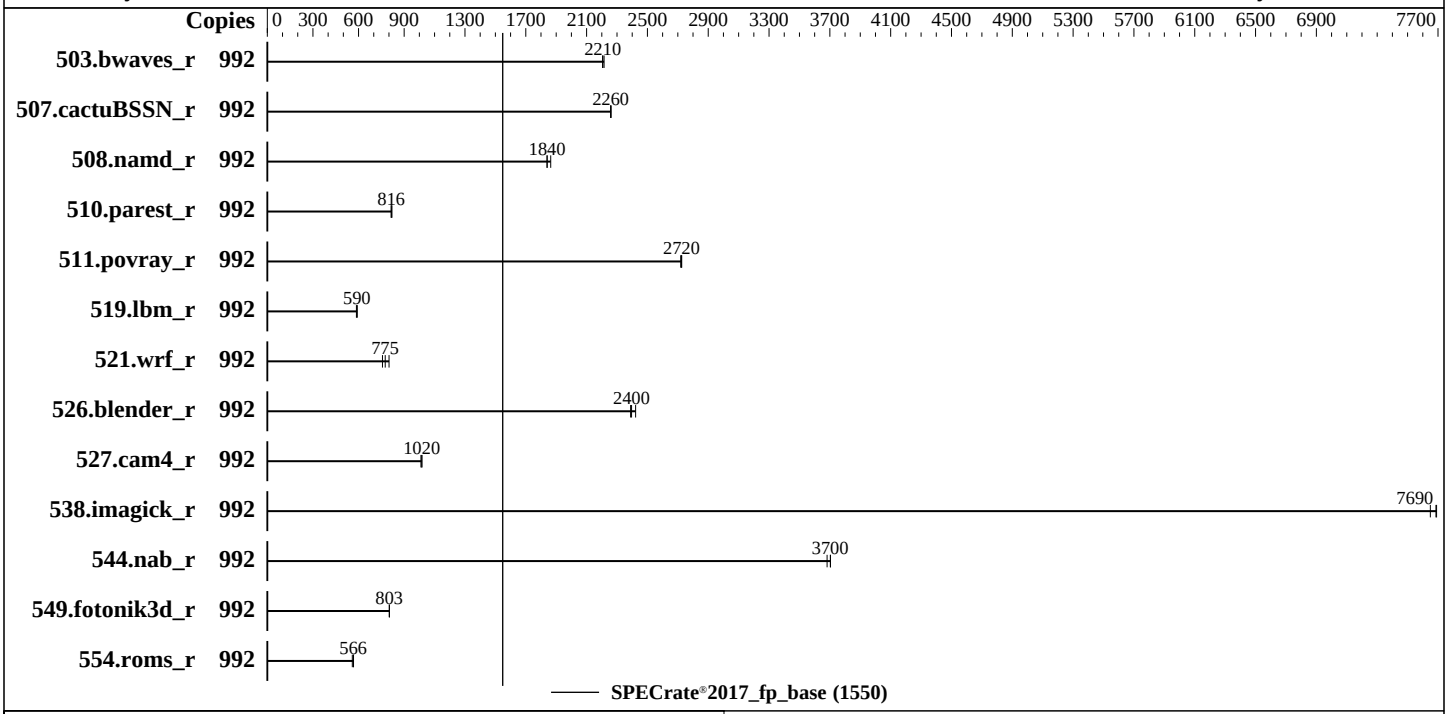
vSMP ServerONE
Supermicro A+ Server 2123BT-HNC0R (AMD EPYC 7702)

SPECrate®2017_fp_base = 1550

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 2929
Test Sponsor: ScaleMP
Tested by: ScaleMP

Test Date: Dec-2019
Hardware Availability: Nov-2019
Software Availability: Nov-2019



Hardware

CPU Name: AMD EPYC 7702
Max MHz: 3350
Nominal: 2000
Enabled: 512 cores, 8 chips, 2 threads/core
Orderable: 1-8 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 512 KB I+D on chip per core
L3: 256 MB I+D on chip per chip, 16 MB shared / 4 cores
Other: None
Memory: 2 TB (64 x 32 GB 2Rx4 PC4-2667V-L)

Storage: 2 TB ramfs
Other: ScaleMP vSMP Foundation aggregates multiple servers into one shared-memory system.
Hardware Details:
vSMP System was aggregated using 4 units of Supermicro A+ Server 2123BT-HNC0R.
The servers were connected using Mellanox InfiniBand EDR fabric.

Software

OS: SUSE Linux Enterprise Server 15 SP1, kernel version 4.12.14-197.21.1.vSMP.2-default
Compiler: C/C++/Fortran: Version 2.0.0 of AOCC
Parallel: No
Firmware: ScaleMP vSMP Foundation version 9.5.195.12 released Nov-2019
File System: ramfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc: jemalloc memory allocator library v5.2.1
Power Management: --

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	992	4491	2210	**4508**	**2210**	4511	2210							
507.cactuBSSN_r	992	**556**	**2260**	556	2260	555	2260							
508.namd_r	992	**512**	**1840**	512	1840	506	1860							
510.parest_r	992	3166	820	3186	814	**3181**	**816**							
511.povray_r	992	**850**	**2720**	850	2730	852	2720							
519.lbm_r	992	1771	590	**1772**	**590**	1784	586							
521.wrf_r	992	2776	801	**2866**	**775**	2934	757							
526.blender_r	992	632	2390	**631**	**2400**	624	2420							
527.cam4_r	992	1717	1010	1707	1020	**1707**	**1020**							
538.imagick_r	992	323	7650	**321**	**7690**	321	7690							
544.nab_r	992	453	3680	**451**	**3700**	451	3700							
549.fotonik3d_r	992	**4816**	**803**	4813	803	4817	803							
554.roms_r	992	2820	559	2780	567	**2785**	**566**							

SPECrate®2017_fp_base = 1550

SPECrate®2017_fp_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

```
The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/
```

Submit Notes

```
The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.
```

Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runcpu
Set numa_stat=0 to improve page allocation performance
```

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Operating System Notes (Continued)

```
Set stat_interval=60 to reduce OS jitter

dirty_ratio, swappiness, zone_reclaim_mode, drop_caches, numa_stat and stat_interval were
all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages set to 'always' for this run (OS default)

Kernel Boot Parameter set with : nohz_full=!0
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/dev/shm/amd_rate_aocc200_rome_C_lib/64;/dev/shm/amd_rate_aocc200_rome_
     C_lib/32:/usr/local/lib:/usr/lib:/usr/lib64:/mnt/aocc-compiler-2.0.0/lib
     :/mnt/aocc-compiler-2.0.0/lib32:"
MALLOC_CONF = "retain:true,metadata_thp:always,thp:always"
```

General Notes

```
Environment variables set by runcpu before the start of the run:
 LD_LIBRARY_PATH=/usr/local/lib:$LD_LIBRARY_PATH
 LIBRARY_PATH=/usr/local/lib:$LIBRARY_PATH
 MALLOC_TOP_PAD_=$((16777216))
 MALLOC_TRIM_THRESHOLD_=$((16777216))

NA: 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.

jemalloc: configured and built with AMD64 AOCC v2.0.0 on this system with -Ofast -march=znver2
jemalloc 5.2.1 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.2.1/jemalloc-5.2.1.tar.bz2
```

Platform Notes

```
BIOS settings:
 Determinism Control = Manual
 Determinism Slider = Power
 cTDP Control = Manual
```

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Platform Notes (Continued)

```
cTDP = 180
Package Power Limit Control = Manual
Package Power Limit = 180
IOMMU = Enabled
APBDIS = 1
NUMA Nodes Per Socket = NPS4

Sysinfo program /dev/shm/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on 13d Sun Dec  8 02:25:22 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 : AMD EPYC 7702 64-Core Processor
      8  "physical id"s (chips)
      1024 "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 : 64
      siblings  : 128
      physical 0: cores 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 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 56 57 58 59 60 61 62 63
      physical 1: cores 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 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 56 57 58 59 60 61 62 63
      physical 2: cores 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 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 56 57 58 59 60 61 62 63
      physical 3: cores 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 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 56 57 58 59 60 61 62 63
      physical 4: cores 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 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 56 57 58 59 60 61 62 63
      physical 5: cores 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 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 56 57 58 59 60 61 62 63
      physical 6: cores 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 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 56 57 58 59 60 61 62 63
      physical 7: cores 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 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 56 57 58 59 60 61 62 63
```

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Platform Notes (Continued)

```
 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      Address sizes:         47 bits physical, 48 bits virtual
      CPU(s):                1024
      On-line CPU(s) list:   0-1023
      Thread(s) per core:    2
      Core(s) per socket:    64
      Socket(s):             8
      NUMA node(s):          32
      Vendor ID:             AuthenticAMD
      CPU family:            23
      Model:                 49
      Model name:            AMD EPYC 7702 64-Core Processor
      Stepping:              0
      CPU MHz:               2000.000
      CPU max MHz:           2000.0000
      CPU min MHz:           1800.0000
      BogoMIPS:              4000.04
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              512K
      L3 cache:              16384K
      NUMA node0 CPU(s):     0-15,512-527
      NUMA node1 CPU(s):     16-31,528-543
      NUMA node2 CPU(s):     32-47,544-559
      NUMA node3 CPU(s):     48-63,560-575
      NUMA node4 CPU(s):     64-79,576-591
      NUMA node5 CPU(s):     80-95,592-607
      NUMA node6 CPU(s):     96-111,608-623
      NUMA node7 CPU(s):     112-127,624-639
      NUMA node8 CPU(s):     128-143,640-655
      NUMA node9 CPU(s):     144-159,656-671
      NUMA node10 CPU(s):    160-175,672-687
      NUMA node11 CPU(s):    176-191,688-703
      NUMA node12 CPU(s):    192-207,704-719
      NUMA node13 CPU(s):    208-223,720-735
      NUMA node14 CPU(s):    224-239,736-751
      NUMA node15 CPU(s):    240-255,752-767
      NUMA node16 CPU(s):    256-271,768-783
      NUMA node17 CPU(s):    272-287,784-799
      NUMA node18 CPU(s):    288-303,800-815
      NUMA node19 CPU(s):    304-319,816-831
      NUMA node20 CPU(s):    320-335,832-847
      NUMA node21 CPU(s):    336-351,848-863
```

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Platform Notes (Continued)

```
      NUMA node22 CPU(s):  352-367,864-879
      NUMA node23 CPU(s):  368-383,880-895
      NUMA node24 CPU(s):  384-399,896-911
      NUMA node25 CPU(s):  400-415,912-927
      NUMA node26 CPU(s):  416-431,928-943
      NUMA node27 CPU(s):  432-447,944-959
      NUMA node28 CPU(s):  448-463,960-975
      NUMA node29 CPU(s):  464-479,976-991
      NUMA node30 CPU(s):  480-495,992-1007
      NUMA node31 CPU(s):  496-511,1008-1023
      Flags:               fpu vme de pse tsc msr pae cx8 apic sep mtrr pge mca cmov pat
      pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
      constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq
      ssse3 fma cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm
      cmp_legacy extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw skinit wdt
      tce topoext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx cpb cat_l3 cdp_l3
      hw_pstate ssbd ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 cqm rdt_a rdseed
      adx smap clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
      cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr arat npt lbrv svm_lock
      nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold
      avic v_vmsave_vmload vgif umip rdpid overflow_recov succor smca

  /proc/cpuinfo cache data
     cache size : 512 KB

  From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
    available: 32 nodes (0-31)
    node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 512 513 514 515 516 517 518 519 520
    521 522 523 524 525 526 527
    node 0 size: 46868 MB
    node 0 free: 46472 MB
    node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 528 529 530 531 532 533
    534 535 536 537 538 539 540 541 542 543
    node 1 size: 59461 MB
    node 1 free: 59226 MB
    node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 544 545 546 547 548 549
    550 551 552 553 554 555 556 557 558 559
    node 2 size: 59461 MB
    node 2 free: 59194 MB
    node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 560 561 562 563 564 565
    566 567 568 569 570 571 572 573 574 575
    node 3 size: 59461 MB
    node 3 free: 59189 MB
    node 4 cpus: 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 576 577 578 579 580 581
    582 583 584 585 586 587 588 589 590 591
    node 4 size: 59461 MB
```

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Platform Notes (Continued)

```
node 4 free: 59281 MB
node 5 cpus: 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 592 593 594 595 596 597
598 599 600 601 602 603 604 605 606 607
node 5 size: 59461 MB
node 5 free: 59207 MB
node 6 cpus: 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 608 609 610
611 612 613 614 615 616 617 618 619 620 621 622 623
node 6 size: 59461 MB
node 6 free: 59277 MB
node 7 cpus: 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 624 625
626 627 628 629 630 631 632 633 634 635 636 637 638 639
node 7 size: 59461 MB
node 7 free: 59287 MB
node 8 cpus: 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 640 641
642 643 644 645 646 647 648 649 650 651 652 653 654 655
node 8 size: 47617 MB
node 8 free: 47455 MB
node 9 cpus: 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 656 657
658 659 660 661 662 663 664 665 666 667 668 669 670 671
node 9 size: 59461 MB
node 9 free: 59297 MB
node 10 cpus: 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 672 673
674 675 676 677 678 679 680 681 682 683 684 685 686 687
node 10 size: 59461 MB
node 10 free: 59304 MB
node 11 cpus: 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 688 689
690 691 692 693 694 695 696 697 698 699 700 701 702 703
node 11 size: 59461 MB
node 11 free: 59295 MB
node 12 cpus: 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 704 705
706 707 708 709 710 711 712 713 714 715 716 717 718 719
node 12 size: 59461 MB
node 12 free: 59295 MB
node 13 cpus: 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 720 721
722 723 724 725 726 727 728 729 730 731 732 733 734 735
node 13 size: 59461 MB
node 13 free: 59294 MB
node 14 cpus: 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 736 737
738 739 740 741 742 743 744 745 746 747 748 749 750 751
node 14 size: 59461 MB
node 14 free: 59299 MB
node 15 cpus: 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 752 753
754 755 756 757 758 759 760 761 762 763 764 765 766 767
node 15 size: 59461 MB
node 15 free: 59301 MB
node 16 cpus: 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 768 769
770 771 772 773 774 775 776 777 778 779 780 781 782 783
```

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Platform Notes (Continued)

```
node 16 size: 47617 MB
node 16 free: 47446 MB
node 17 cpus: 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 784 785
786 787 788 789 790 791 792 793 794 795 796 797 798 799
node 17 size: 59531 MB
node 17 free: 59364 MB
node 18 cpus: 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 800 801
802 803 804 805 806 807 808 809 810 811 812 813 814 815
node 18 size: 59461 MB
node 18 free: 59297 MB
node 19 cpus: 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 816 817
818 819 820 821 822 823 824 825 826 827 828 829 830 831
node 19 size: 59461 MB
node 19 free: 59294 MB
node 20 cpus: 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 832 833
834 835 836 837 838 839 840 841 842 843 844 845 846 847
node 20 size: 59461 MB
node 20 free: 59293 MB
node 21 cpus: 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 848 849
850 851 852 853 854 855 856 857 858 859 860 861 862 863
node 21 size: 59461 MB
node 21 free: 59294 MB
node 22 cpus: 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 864 865
866 867 868 869 870 871 872 873 874 875 876 877 878 879
node 22 size: 59461 MB
node 22 free: 59292 MB
node 23 cpus: 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 880 881
882 883 884 885 886 887 888 889 890 891 892 893 894 895
node 23 size: 59461 MB
node 23 free: 59302 MB
node 24 cpus: 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 896 897
898 899 900 901 902 903 904 905 906 907 908 909 910 911
node 24 size: 47617 MB
node 24 free: 47437 MB
node 25 cpus: 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 912 913
914 915 916 917 918 919 920 921 922 923 924 925 926 927
node 25 size: 59461 MB
node 25 free: 59297 MB
node 26 cpus: 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 928 929
930 931 932 933 934 935 936 937 938 939 940 941 942 943
node 26 size: 59461 MB
node 26 free: 59301 MB
node 27 cpus: 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 944 945
946 947 948 949 950 951 952 953 954 955 956 957 958 959
node 27 size: 59461 MB
node 27 free: 59298 MB
node 28 cpus: 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 960 961
```

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Platform Notes (Continued)

```
962 963 964 965 966 967 968 969 970 971 972 973 974 975
node 28 size: 59209 MB
node 28 free: 59047 MB
node 29 cpus: 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 976 977
978 979 980 981 982 983 984 985 986 987 988 989 990 991
node 29 size: 59209 MB
node 29 free: 59047 MB
node 30 cpus: 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 992 993
994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007
node 30 size: 59209 MB
node 30 free: 59049 MB
node 31 cpus: 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 1008 1009
1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023
node 31 size: 58948 MB
node 31 free: 58792 MB
node distances:
node   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  28  29  30  31
  0:  10  12  12  12  32  32  32  32 254 254 254 254 254 254 254 254 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  1:  12  10  12  12  32  32  32  32 254 254 254 254 254 254 254 254 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  2:  12  12  10  12  32  32  32  32 254 254 254 254 254 254 254 254 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  3:  12  12  12  10  32  32  32  32 254 254 254 254 254 254 254 254 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  4:  32  32  32  32  10  12  12  12 254 254 254 254 254 254 254 254 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  5:  32  32  32  32  12  10  12  12 254 254 254 254 254 254 254 254 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  6:  32  32  32  32  12  12  10  12 254 254 254 254 254 254 254 254 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  7:  32  32  32  32  12  12  12  10 254 254 254 254 254 254 254 254 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  8: 254 254 254 254 254 254 254 254  10  12  12  12  32  32  32  32 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
  9: 254 254 254 254 254 254 254 254  12  10  12  12  32  32  32  32 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
 10: 254 254 254 254 254 254 254 254  12  12  10  12  32  32  32  32 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
 11: 254 254 254 254 254 254 254 254  12  12  12  10  32  32  32  32 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
 12: 254 254 254 254 254 254 254 254  32  32  32  32  10  12  12  12 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
 13: 254 254 254 254 254 254 254 254  32  32  32  32  12  10  12  12 254 254
 254 254 254 254 254 254 254 254 254 254 254 254 254 254
 14: 254 254 254 254 254 254 254 254  32  32  32  32  12  12  10  12 254 254
```

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Platform Notes (Continued)

```
    254  254  254  254  254  254  254  254  254  254  254  254  254  254
    15:  254  254  254  254  254  254  254  254  32  32  32  32  12  12  12  10  254  254
    254  254  254  254  254  254  254  254  254  254  254  254  254  254
    16:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    10  12  12  12  32  32  32  32  254  254  254  254  254  254  254  254
    17:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    12  10  12  12  32  32  32  32  254  254  254  254  254  254  254  254
    18:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    12  12  10  12  32  32  32  32  254  254  254  254  254  254  254  254
    19:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    12  12  12  10  32  32  32  32  254  254  254  254  254  254  254  254
    20:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    32  32  32  32  10  12  12  12  254  254  254  254  254  254  254  254
    21:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    32  32  32  32  12  10  12  12  254  254  254  254  254  254  254  254
    22:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    32  32  32  32  12  12  10  12  254  254  254  254  254  254  254  254
    23:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    32  32  32  32  12  12  12  10  254  254  254  254  254  254  254  254
    24:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    254  254  254  254  254  254  254  254  10  12  12  12  32  32  32  32
    25:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    254  254  254  254  254  254  254  254  12  10  12  12  32  32  32  32
    26:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    254  254  254  254  254  254  254  254  12  12  10  12  32  32  32  32
    27:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    254  254  254  254  254  254  254  254  12  12  12  10  32  32  32  32
    28:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    254  254  254  254  254  254  254  254  32  32  32  32  10  12  12  12
    29:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    254  254  254  254  254  254  254  254  32  32  32  32  12  10  12  12
    30:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    254  254  254  254  254  254  254  254  32  32  32  32  12  12  10  12
    31:  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254  254
    254  254  254  254  254  254  254  254  32  32  32  32  12  12  12  10

  From /proc/meminfo
     MemTotal:       1897918224 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  From /etc/*release* /etc/*version*
     os-release:
        NAME="SLES"
        VERSION="15-SP1"
        VERSION_ID="15.1"
        PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
```


(Continued on next page)

Platform Notes (Continued)

```
       ID="sles"
       ID_LIKE="suse"
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/o:suse:sles:15:sp1"

  uname -a:
     Linux 13d 4.12.14-197.21.1.vSMP.2-default #1 SMP Mon Oct 7 08:41:58 EDT 2019 (8ef2efd)
     x86_64 x86_64 x86_64 GNU/Linux

  Kernel self-reported vulnerability status:

  CVE-2018-3620 (L1 Terminal Fault):        Not affected
  Microarchitectural Data Sampling:         Not affected
  CVE-2017-5754 (Meltdown):                 Not affected
  CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled
                                             via prctl and seccomp
  CVE-2017-5753 (Spectre variant 1):       Mitigation: usercopy/swapgs barriers and __user
                                             pointer sanitization
  CVE-2017-5715 (Spectre variant 2):        Mitigation: Full AMD retpoline, IBPB:
                                            conditional, IBRS_FW, STIBP: conditional, RSB
                                             filling

  run-level 3 Dec 8 01:36

  SPEC is set to: /dev/shm
     Filesystem     Type   Size  Used Avail Use% Mounted on
     ramfs          ramfs     0     0     0    - /dev/shm

  From /sys/devices/virtual/dmi/id
      BIOS:    ScaleMP 9.5.195.12 11/26/2019
      Vendor:  ScaleMP
      Product: vSMP Foundation
      Serial:  1122334

  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.
    Memory:
      16x Micron Technology 36ASF4G72PZ-2G6E1 32 kB 2 rank 2667
      48x SK Hynix HMA84GR7AFR4N-VK 32 kB 2 rank 2667

  (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++             | 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
```

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Compiler Version Notes (Continued)

```
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /mnt/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

Fortran benchmarks:
`flang`

Benchmarks using both Fortran and C:
`flang clang`

(Continued on next page)

Base Compiler Invocation (Continued)

Benchmarks using both C and C++:
clang++ clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -D__BOOL_DEFINED -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-fremap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -z muldefs -lmvec -lamdlibm -ljemalloc
-lflang

C++ benchmarks:
-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2

(Continued on next page)

Base Optimization Flags (Continued)

C++ benchmarks (continued):
-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-partial-unswitch -z muldefs -lmvec -lamdlibm
-ljemalloc -lflang

Fortran benchmarks:
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver2
-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using both Fortran and C:
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-fremap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -funroll-loops -Mrecursive -z muldefs
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using both C and C++:
-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-fstruct-layout=3 -mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -unroll-threshold=100 -mllvm -enable-partial-unswitch -z muldefs
-lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using Fortran, C, and C++:
-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-fstruct-layout=3 -mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000

(Continued on next page)

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -unroll-threshold=100 -mllvm -enable-partial-unswitch
-funroll-loops -Mrecursive -z muldefs -Kieee -fno-finite-math-only
-lmvec -lamdlibm -ljemalloc -lflang

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/aocc200-flags-B1.html
http://www.spec.org/cpu2017/flags/ScaleMP-Supermicro-Platform-Settings-V1.2-Rome-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc200-flags-B1.xml
http://www.spec.org/cpu2017/flags/ScaleMP-Supermicro-Platform-Settings-V1.2-Rome-revA.xml

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