# SPEC CPU®2017 Floating Point Rate Result

## ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.10 GHz, Intel Xeon Gold 6430)

$SPECrate®2017\_fp\_base = 644$
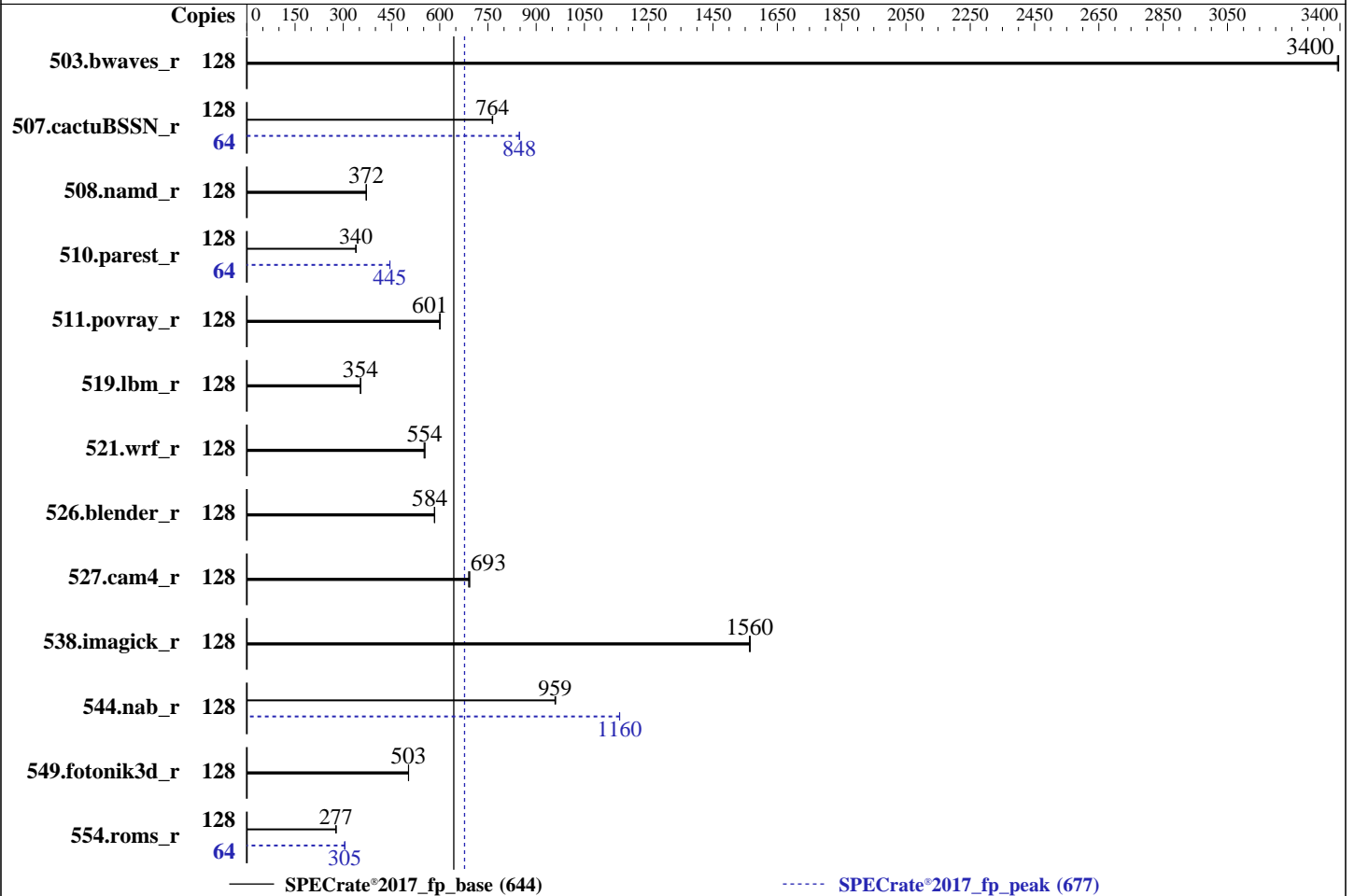
$SPECrate®2017\_fp\_peak = 677$

**CPU2017 License:** 9016
**Test Sponsor:** ASUSTeK Computer Inc.
**Tested by:** ASUSTeK Computer Inc.

**Test Date:** Apr-2023
**Hardware Availability:** Feb-2023
**Software Availability:** Dec-2022

| Benchmark | Copies | base | peak |
|---|---|---|---|
| 503.bwaves_r | 128 | 3400 | |
| 507.cactuBSSN_r | 128 | 764 | |
| | 64 | | 848 |
| 508.namd_r | 128 | 372 | |
| 510.parest_r | 128 | 340 | |
| | 64 | | 445 |
| 511.povray_r | 128 | 601 | |
| 519.lbm_r | 128 | 354 | |
| 521.wrf_r | 128 | 554 | |
| 526.blender_r | 128 | 584 | |
| 527.cam4_r | 128 | 693 | |
| 538.imagick_r | 128 | 1560 | |
| 544.nab_r | 128 | 959 | |
| | | | 1160 |
| 549.fotonik3d_r | 128 | 503 | |
| 554.roms_r | 128 | 277 | |
| | 64 | | 305 |

SPECrate®2017_fp_base (644) ------ SPECrate®2017_fp_peak (677)

## Hardware

CPU Name: Intel Xeon Gold 6430
 Max MHz: 3400
 Nominal: 2100
Enabled: 64 cores, 2 chips, 2 threads/core
Orderable: 1, 2 chip(s)
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 60 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R, running at 4400)
Storage: 1 x 1.6 TB PCIE NVME SSD
Other: None

## Software

OS: SUSE Linux Enterprise Server 15 SP4 (x86_64)
 Kernel 5.14.21-150400.22-default
Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 0503 released Feb-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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## Results Table

| | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benchmark | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 503.bwaves_r | 128 | 378 | 3400 | **378** | **3400** | 378 | 3390 | 128 | 378 | 3400 | **378** | **3400** | 378 | 3390 |
| 507.cactuBSSN_r | 128 | 212 | 765 | **212** | **764** | 212 | 764 | 64 | 95.5 | 848 | **95.5** | **848** | 95.6 | 848 |
| 508.namd_r | 128 | 327 | 371 | **327** | **372** | 327 | 372 | 128 | 327 | 371 | **327** | **372** | 327 | 372 |
| 510.parest_r | 128 | 988 | 339 | 986 | 340 | **986** | **340** | 64 | **376** | **445** | 376 | 445 | 376 | 445 |
| 511.povray_r | 128 | **498** | **601** | 497 | 601 | 498 | 600 | 128 | **498** | **601** | 497 | 601 | 498 | 600 |
| 519.lbm_r | 128 | 381 | 354 | **381** | **354** | 381 | 354 | 128 | 381 | 354 | **381** | **354** | 381 | 354 |
| 521.wrf_r | 128 | 518 | 554 | **518** | **554** | 520 | 551 | 128 | 518 | 554 | **518** | **554** | 520 | 551 |
| 526.blender_r | 128 | 334 | 584 | **334** | **584** | 334 | 584 | 128 | 334 | 584 | **334** | **584** | 334 | 584 |
| 527.cam4_r | 128 | **323** | **693** | 323 | 693 | 325 | 690 | 128 | **323** | **693** | 323 | 693 | 325 | 690 |
| 538.imagick_r | 128 | 204 | 1560 | 203 | 1570 | **204** | **1560** | 128 | 204 | 1560 | 203 | 1570 | **204** | **1560** |
| 544.nab_r | 128 | 224 | 961 | 225 | 959 | **225** | **959** | 128 | 186 | 1160 | **186** | **1160** | 186 | 1160 |
| 549.fotonik3d_r | 128 | 992 | 503 | **992** | **503** | 991 | 503 | 128 | 992 | 503 | **992** | **503** | 991 | 503 |
| 554.roms_r | 128 | 732 | 278 | 734 | 277 | **734** | **277** | 64 | 334 | 304 | 333 | 305 | **334** | **305** |
| **SPECrate®2017_fp_base =** | | **644** | | | | | | | | | | | | |
| **SPECrate®2017_fp_peak =** | | **677** | | | | | | | | | | | | |

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"
OS set to performance mode via cpupower frequency-set -g performance
```

## Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/cpu119/lib/intel64:/cpu119/je5.0.1-64"
MALLOC_CONF = "retain:true"
```

## General Notes

```
Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Red Hat Enterprise Linux 8.4
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>
```

**(Continued on next page)**

Standard Performance Evaluation Corporation (info@spec.org)    https://www.spec.org/

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## General Notes (Continued)

```
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, 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:
VT-d = Disabled
Patrol Scrub = Disabled
SNC = Enable SNC4 (4-clusters)
Engine Boost = Aggressive
SR-IOV Support = Disabled
BMC Configuration:
Fan mode = Full speed mode

 Sysinfo program /cpu119/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Tue Apr 18 00:29:24 2023

 SUT (System Under Test) info as seen by some common utilities.

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
 16. /sys/kernel/mm/transparent_hugepage
 17. /sys/kernel/mm/transparent_hugepage/khugepaged
 18. OS release
 19. Disk information
 20. /sys/devices/virtual/dmi/id
 21. dmidecode
 22. BIOS
 ------------------------------------------------------------

 ------------------------------------------------------------
  1. uname -a
    Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
    x86_64 x86_64 x86_64 GNU/Linux
```

(Continued on next page)

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## Platform Notes (Continued)

```
     ----------------------------------------------------------
 2. w
     00:29:24 up  6:41,  2 users,  load average: 86.55, 117.75, 123.48
     USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
     root     tty1     -                17:49    6:39m  1.06s  0.04s -bash
     root     tty2     -                17:49    6:39m  0.02s  0.02s -bash


     ----------------------------------------------------------
 3. Username
     From environment variable $USER:  root


     ----------------------------------------------------------
 4. ulimit -a
     core file size          (blocks, -c) unlimited
     data seg size           (kbytes, -d) unlimited
     scheduling priority             (-e) 0
     file size               (blocks, -f) unlimited
     pending signals                 (-i) 4126778
     max locked memory       (kbytes, -l) 64
     max memory size         (kbytes, -m) unlimited
     open files                      (-n) 1024
     pipe size            (512 bytes, -p) 8
     POSIX message queues     (bytes, -q) 819200
     real-time priority              (-r) 0
     stack size              (kbytes, -s) unlimited
     cpu time               (seconds, -t) unlimited
     max user processes              (-u) 4126778
     virtual memory          (kbytes, -v) unlimited
     file locks                      (-x) unlimited


     ----------------------------------------------------------
 5. sysinfo process ancestry
    /usr/lib/systemd/systemd --switched-root --system --deserialize 30
    login -- root
    -bash
    -bash
    -bash
    runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
      ic2023.0-lin-core-avx512-rate-20221201.cfg --define smt-on --define cores=64 --define physicalfirst
      --define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
    runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
      ic2023.0-lin-core-avx512-rate-20221201.cfg --define smt-on --define cores=64 --define physicalfirst
      --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
      --runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
      $SPEC/tmp/CPU2017.278/templogs/preenv.fprate.278.0.log --lognum 278.0 --from_runcpu 2
    specperl $SPEC/bin/sysinfo
    $SPEC = /cpu119


     ----------------------------------------------------------
 6. /proc/cpuinfo
     model name      : Intel(R) Xeon(R) Gold 6430
     vendor_id       : GenuineIntel
     cpu family      : 6
     model           : 143
     stepping        : 8
     microcode       : 0x2b000161
     bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
     cpu cores       : 32
     siblings        : 64
     2 physical ids (chips)
```

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## Platform Notes (Continued)

```
    128 processors (hardware threads)
    physical id 0: core ids 0-31
    physical id 1: core ids 0-31
    physical id 0: apicids 0-63
    physical id 1: apicids 128-191
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.


  -----------------------------------------------------------
  7. lscpu

  From lscpu from util-linux 2.37.2:
    Architecture:            x86_64
    CPU op-mode(s):          32-bit, 64-bit
    Address sizes:           46 bits physical, 57 bits virtual
    Byte Order:              Little Endian
    CPU(s):                  128
    On-line CPU(s) list:     0-127
    Vendor ID:               GenuineIntel
    Model name:              Intel(R) Xeon(R) Gold 6430
    CPU family:              6
    Model:                   143
    Thread(s) per core:      2
    Core(s) per socket:      32
    Socket(s):               2
    Stepping:                8
    CPU max MHz:             3400.0000
    CPU min MHz:             800.0000
    BogoMIPS:                4200.00
    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 tsc_known_freq 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 cat_l2 cdp_l3
                             invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
                             tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle
                             avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
                             avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
                             xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                             cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
                             arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku
                             ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                             tme avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri movdir64b
                             enqcmd fsrm md_clear serialize tsxldtrk pconfig arch_lbr avx512_fp16
                             amx_tile flush_l1d arch_capabilities
    Virtualization:          VT-x
    L1d cache:               3 MiB (64 instances)
    L1i cache:               2 MiB (64 instances)
    L2 cache:                128 MiB (64 instances)
    L3 cache:                120 MiB (2 instances)
    NUMA node(s):            8
    NUMA node0 CPU(s):       0-7,64-71
    NUMA node1 CPU(s):       8-15,72-79
    NUMA node2 CPU(s):       16-23,80-87
    NUMA node3 CPU(s):       24-31,88-95
    NUMA node4 CPU(s):       32-39,96-103
    NUMA node5 CPU(s):       40-47,104-111
    NUMA node6 CPU(s):       48-55,112-119
```

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## Platform Notes (Continued)

```
   NUMA node7 CPU(s):           56-63,120-127
 Vulnerability Itlb multihit:    Not affected
 Vulnerability L1tf:             Not affected
 Vulnerability Mds:              Not affected
 Vulnerability Meltdown:         Not affected
 Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
 Vulnerability Spectre v1:       Mitigation; usercopy/swapgs barriers and __user pointer sanitization
 Vulnerability Spectre v2:       Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
 Vulnerability Srbds:            Not affected
 Vulnerability Tsx async abort:  Not affected

 From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d      48K       3M  12 Data           1    64       1             64
      L1i      32K       2M   8 Instruction    1    64       1             64
      L2        2M     128M  16 Unified        2  2048       1             64
      L3       60M     120M  15 Unified        3 65536       1             64

 -------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 8 nodes (0-7)
   node 0 cpus: 0-7,64-71
   node 0 size: 128661 MB
   node 0 free: 117152 MB
   node 1 cpus: 8-15,72-79
   node 1 size: 129019 MB
   node 1 free: 122262 MB
   node 2 cpus: 16-23,80-87
   node 2 size: 129019 MB
   node 2 free: 122401 MB
   node 3 cpus: 24-31,88-95
   node 3 size: 129019 MB
   node 3 free: 122383 MB
   node 4 cpus: 32-39,96-103
   node 4 size: 129019 MB
   node 4 free: 122389 MB
   node 5 cpus: 40-47,104-111
   node 5 size: 129019 MB
   node 5 free: 122378 MB
   node 6 cpus: 48-55,112-119
   node 6 size: 129019 MB
   node 6 free: 122406 MB
   node 7 cpus: 56-63,120-127
   node 7 size: 128938 MB
   node 7 free: 122328 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  12  12  12  21  21  21  21
     1:  12  10  12  12  21  21  21  21
     2:  12  12  10  12  21  21  21  21
     3:  12  12  12  10  21  21  21  21
     4:  21  21  21  21  10  12  12  12
     5:  21  21  21  21  12  10  12  12
     6:  21  21  21  21  12  12  10  12
     7:  21  21  21  21  12  12  12  10

 -------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:      1056479844 kB
```

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## Platform Notes (Continued)

```
  ----------------------------------------------------------
  10. who -r
    run-level 3 Apr 17 17:48


  ----------------------------------------------------------
  11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
    Default Target  Status
    multi-user      running


  ----------------------------------------------------------
  12. Services, from systemctl list-unit-files
    STATE           UNIT FILES
    enabled         YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager getty@ haveged
                    irqbalance issue-generator kbdsettings klog lvm2-monitor nscd nvmefc-boot-connections
                    postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4
                    wickedd-dhcp6 wickedd-nanny
    enabled-runtime systemd-remount-fs
    disabled        autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                    chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                    firewalld gpm grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd
                    issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap
                    nvmf-autoconnect rdisc rpcbind rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts
                    snmpd snmptrapd svnserve systemd-boot-check-no-failures systemd-network-generator
                    systemd-sysext systemd-time-wait-sync systemd-timesyncd udisks2
    indirect        wickedd


  ----------------------------------------------------------
  13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
    root=UUID=1821a225-9785-4821-9a33-99bd3ded8cae
    splash=silent
    mitigations=auto
    quiet
    security=apparmor


  ----------------------------------------------------------
  14. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 800 MHz and 3.40 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
        Supported: yes
        Active: yes


  ----------------------------------------------------------
  15. sysctl
    kernel.numa_balancing          1
    kernel.randomize_va_space      2
    vm.compaction_proactiveness    20
    vm.dirty_background_bytes      0
    vm.dirty_background_ratio      10
    vm.dirty_bytes                 0
    vm.dirty_expire_centisecs      3000
    vm.dirty_ratio                 20
    vm.dirty_writeback_centisecs   500
    vm.dirtytime_expire_seconds    43200
    vm.extfrag_threshold           500
    vm.min_unmapped_ratio          1
```

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## Platform Notes (Continued)

```
  vm.nr_hugepages                      0
  vm.nr_hugepages_mempolicy            0
  vm.nr_overcommit_hugepages           0
  vm.swappiness                        60
  vm.watermark_boost_factor         15000
  vm.watermark_scale_factor            10
  vm.zone_reclaim_mode                 0


  ----------------------------------------------------------------
16. /sys/kernel/mm/transparent_hugepage
  defrag          always defer defer+madvise [madvise] never
  enabled         [always] madvise never
  hpage_pmd_size  2097152
  shmem_enabled   always within_size advise [never] deny force


  ----------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage/khugepaged
  alloc_sleep_millisecs   60000
  defrag                      1
  max_ptes_none             511
  max_ptes_shared           256
  max_ptes_swap              64
  pages_to_scan            4096
  scan_sleep_millisecs    10000

  ----------------------------------------------------------------
18. OS release
  From /etc/*-release /etc/*-version
  os-release SUSE Linux Enterprise Server 15 SP4

  ----------------------------------------------------------------
19. Disk information
SPEC is set to: /cpu119
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/nvme0n1p8 xfs   1.3T   73G  1.2T   6% /

  ----------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:          ASUSTeK COMPUTER INC.
    Product:         RS720-E11-RS12U
    Product Family:  Server

  ----------------------------------------------------------------
21. dmidecode
  Additional information from dmidecode 3.2 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 Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800, configured at 4400



  ----------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
  BIOS Vendor:      American Megatrends Inc.
  BIOS Version:     0503
  BIOS Date:        01/31/2023
  BIOS Revision:    5.3
```

## ASUSTeK Computer Inc.

SPECrate®2017_fp_base = 644

ASUS RS720-E11-RS12U
(2.10 GHz, Intel Xeon Gold 6430)

SPECrate®2017_fp_peak = 677

| | | | |
|---|---|---|---|
| **CPU2017 License:** | 9016 | **Test Date:** | Apr-2023 |
| **Test Sponsor:** | ASUSTeK Computer Inc. | **Hardware Availability:** | Feb-2023 |
| **Tested by:** | ASUSTeK Computer Inc. | **Software Availability:** | Dec-2022 |

# Compiler Version Notes

```
==============================================================================
C              | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C++            | 508.namd_r(base, peak) 510.parest_r(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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------------------------------------------------------------------------------


==============================================================================
C++, C         | 511.povray_r(base, peak) 526.blender_r(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran        | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran, C     | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

# Base Compiler Invocation

C benchmarks:

```
icx
```

**(Continued on next page)**

## ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.10 GHz, Intel Xeon Gold 6430)

SPECrate®2017_fp_base = 644

SPECrate®2017_fp_peak = 677

# Base Compiler Invocation (Continued)

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Benchmarks using both Fortran and C:
`ifx icx`

Benchmarks using both C and C++:
`icpx icx`

Benchmarks using Fortran, C, and C++:
`icpx icx ifx`

# 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_LP64 -DSPEC_CASE_FLAG -convert big_endian`
526.blender_r: `-DSPEC_LP64 -DSPEC_LINUX -funsigned-char`
527.cam4_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
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:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

**(Continued on next page)**

## ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.10 GHz, Intel Xeon Gold 6430)

SPECrate®2017_fp_base = 644

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| | | | |
|---|---|---|---|
| **CPU2017 License:** | 9016 | **Test Date:** | Apr-2023 |
| **Test Sponsor:** | ASUSTeK Computer Inc. | **Hardware Availability:** | Feb-2023 |
| **Tested by:** | ASUSTeK Computer Inc. | **Software Availability:** | Dec-2022 |

# Base Optimization Flags (Continued)

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both Fortran and C:
```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -nostandard-realloc-lhs -align array32byte -auto
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both C and C++:
```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:
```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

# Peak Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

Benchmarks using both Fortran and C:
```
ifx icx
```

Benchmarks using both C and C++:
```
icpx icx
```

**(Continued on next page)**

## ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.10 GHz, Intel Xeon Gold 6430)

SPECrate®2017_fp_base = 644

SPECrate®2017_fp_peak = 677

**CPU2017 License:** 9016
**Test Sponsor:** ASUSTeK Computer Inc.
**Tested by:** ASUSTeK Computer Inc.

**Test Date:** Apr-2023
**Hardware Availability:** Feb-2023
**Software Availability:** Dec-2022

# Peak Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
```
icpx icx ifx
```

# Peak Portability Flags

```
Same as Base Portability Flags
```

# Peak Optimization Flags

C benchmarks:

519.lbm_r: `basepeak = yes`

538.imagick_r: `basepeak = yes`

544.nab_r: `-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -Wno-implicit-int`
`-qopt-zmm-usage=high -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

C++ benchmarks:

508.namd_r: `basepeak = yes`

510.parest_r: `-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

Fortran benchmarks:

503.bwaves_r: `basepeak = yes`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math`
`-flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -nostandard-realloc-lhs`
`-align array32byte -auto -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

**(Continued on next page)**

## ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.10 GHz, Intel Xeon Gold 6430)

SPECrate®2017_fp_base = 644

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**CPU2017 License:** 9016
**Test Sponsor:** ASUSTeK Computer Inc.
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**Test Date:** Apr-2023
**Hardware Availability:** Feb-2023
**Software Availability:** Dec-2022

# Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: basepeak = yes

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:
```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z13-V1.0.html
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z13-V1.0.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml

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

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