SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

$SPECrate^{®}2017\_fp\_base = 708$

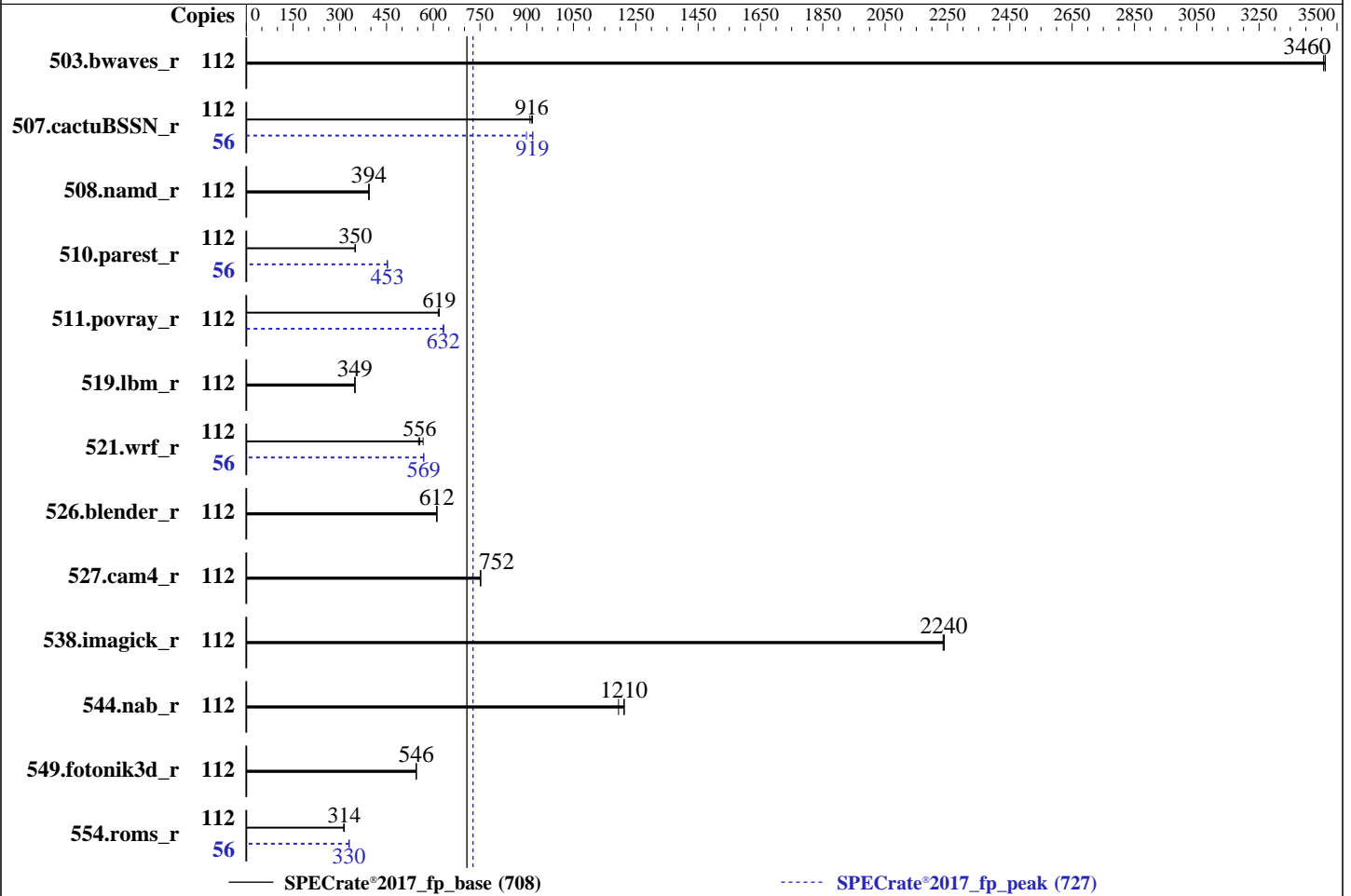$SPECrate^{®}2017\_fp\_peak = 727$

CPU2017 License: 9016

Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Apr-2024

Hardware Availability: Dec-2023

Software Availability: Dec-2023

Benchmark	Copies	base	peak
503.bwaves_r	112	3460	
507.cactuBSSN_r	112 / 56	916	919
508.namd_r	112	394	
510.parest_r	112 / 56	350	453
511.povray_r	112	619	632
519.lbm_r	112	349	
521.wrf_r	112 / 56	556	569
526.blender_r	112	612	
527.cam4_r	112	752	
538.imagick_r	112	2240	
544.nab_r	112	1210	
549.fotonik3d_r	112	546	
554.roms_r	112 / 56	314	330

SPECrate®2017_fp_base (708)   SPECrate®2017_fp_peak (727)

Hardware

CPU Name: Intel Xeon Gold 5520+
 Max MHz: 4000
 Nominal: 2200
Enabled: 56 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: 52.5 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-5600B-R, running at 4800)
Storage: 1 x 1.6 TB PCIe NVMe SSD
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise High Performance Computing 15 SP5 (x86_64) Kernel 5.14.21-150500.53-default

Compiler: C/C++: Version 2024.0.2 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2024.0.2 of Intel Fortran Compiler for Linux;

Parallel: No

Firmware: Version 2201 released Dec-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.

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

CPU2017 License: 9016	**Test Date:** Apr-2024
Test Sponsor: ASUSTeK Computer Inc.	**Hardware Availability:** Dec-2023
Tested by: ASUSTeK Computer Inc.	**Software Availability:** Dec-2023

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	112	**324**	**3460**	325	3460	324	3460	112	**324**	**3460**	325	3460	324	3460
507.cactuBSSN_r	112	156	910	**155**	**916**	154	918	56	**77.2**	**919**	78.8	899	77.1	919
508.namd_r	112	**270**	**394**	270	394	271	393	112	**270**	**394**	270	394	271	393
510.parest_r	112	840	349	**837**	**350**	836	350	56	324	453	**324**	**453**	323	453
511.povray_r	112	422	620	425	616	**422**	**619**	112	414	632	413	634	**414**	**632**
519.lbm_r	112	339	348	**339**	**349**	338	349	112	339	348	**339**	**349**	338	349
521.wrf_r	112	454	553	**451**	**556**	442	567	56	**220**	**569**	220	570	221	569
526.blender_r	112	279	611	279	612	**279**	**612**	112	279	611	279	612	**279**	**612**
527.cam4_r	112	**260**	**752**	261	751	260	752	112	**260**	**752**	261	751	260	752
538.imagick_r	112	124	2240	**124**	**2240**	125	2240	112	124	2240	**124**	**2240**	125	2240
544.nab_r	112	155	1210	158	1190	**156**	**1210**	112	155	1210	158	1190	**156**	**1210**
549.fotonik3d_r	112	801	545	800	546	**800**	**546**	112	801	545	800	546	**800**	**546**
554.roms_r	112	566	315	**566**	**314**	570	312	56	**270**	**330**	270	330	269	331
SPECrate®2017_fp_base =		**708**												
SPECrate®2017_fp_peak =		**727**												

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 = "/ic24u0/lib/intel64:/ic24u0/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)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

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

Test Date: Apr-2024
Hardware Availability: Dec-2023
Software Availability: Dec-2023

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 SNC2 (2-clusters)
Engine Boost = Aggressive
SR-IOV Support = Disabled
BMC Configuration:
Fan mode = Full speed mode

Sysinfo program /ic24u0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Fri Apr 26 17:51:12 2024

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 (249.16+suse.171.gdad0071f15)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS
------------------------------------------------------------


------------------------------------------------------------
 1. uname -a
   Linux localhost 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043)
   x86_64 x86_64 x86_64 GNU/Linux
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

$SPECrate^{®}2017\_fp\_base = 708$

$SPECrate^{®}2017\_fp\_peak = 727$

CPU2017 License: 9016		**Test Date:**	Apr-2024
Test Sponsor:	ASUSTeK Computer Inc.	**Hardware Availability:**	Dec-2023
Tested by:	ASUSTeK Computer Inc.	**Software Availability:**	Dec-2023

Platform Notes (Continued)

```
     ----------------------------------------------------------
  2. w
     17:51:12 up 1 min,  1 user,  load average: 0.31, 0.17, 0.07
     USER     TTY       FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
     root     tty1      -               17:50    7.00s  0.93s  0.00s /bin/bash ./rate.sh


     ----------------------------------------------------------
  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) 4126864
     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) 4126864
     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
   /bin/bash ./rate.sh
   /bin/bash ./rate.sh
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 -c
     ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=56 --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=112 --configfile
     ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=56 --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/CPU2017.230/templogs/preenv.fprate.230.0.log --lognum 230.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /ic24u0


     ----------------------------------------------------------
  6. /proc/cpuinfo
     model name      : INTEL(R) XEON(R) GOLD 5520+
     vendor_id       : GenuineIntel
     cpu family      : 6
     model           : 207
     stepping        : 2
     microcode       : 0x21000200
     bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
     cpu cores       : 28
     siblings        : 56
     2 physical ids (chips)
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

CPU2017 License: 9016

Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Apr-2024

Hardware Availability: Dec-2023

Software Availability: Dec-2023

Platform Notes (Continued)

```
     112 processors (hardware threads)
     physical id 0: core ids 0-27
     physical id 1: core ids 0-27
     physical id 0: apicids 0-55
     physical id 1: apicids 128-183
  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 2.37.4:
    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):                    112
    On-line CPU(s) list:       0-111
    Vendor ID:                 GenuineIntel
    Model name:                INTEL(R) XEON(R) GOLD 5520+
    CPU family:                6
    Model:                     207
    Thread(s) per core:        2
    Core(s) per socket:        28
    Socket(s):                 2
    Stepping:                  2
    CPU max MHz:               4000.0000
    CPU min MHz:               800.0000
    BogoMIPS:                  4400.00
    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 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 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:                 2.6 MiB (56 instances)
    L1i cache:                 1.8 MiB (56 instances)
    L2 cache:                  112 MiB (56 instances)
    L3 cache:                  105 MiB (2 instances)
    NUMA node(s):              4
    NUMA node0 CPU(s):         0-13,56-69
    NUMA node1 CPU(s):         14-27,70-83
    NUMA node2 CPU(s):         28-41,84-97
    NUMA node3 CPU(s):         42-55,98-111
    Vulnerability Itlb multihit:   Not affected
    Vulnerability L1tf:            Not affected
    Vulnerability Mds:             Not affected
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

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

Test Date: Apr-2024
Hardware Availability: Dec-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
   Vulnerability Meltdown:         Not affected
   Vulnerability Mmio stale data:  Not affected
   Vulnerability Retbleed:         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, PBRSB-eIBRS SW
                                   sequence
   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     2.6M  12 Data             1    64        1             64
     L1i      32K     1.8M   8 Instruction      1    64        1             64
     L2        2M     112M  16 Unified          2  2048        1             64
     L3     52.5M     105M  15 Unified          3 57344        1             64

 --------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 4 nodes (0-3)
   node 0 cpus: 0-13,56-69
   node 0 size: 257644 MB
   node 0 free: 256887 MB
   node 1 cpus: 14-27,70-83
   node 1 size: 258040 MB
   node 1 free: 257402 MB
   node 2 cpus: 28-41,84-97
   node 2 size: 258040 MB
   node 2 free: 257411 MB
   node 3 cpus: 42-55,98-111
   node 3 size: 258019 MB
   node 3 free: 257320 MB
   node distances:
   node   0   1   2   3
     0:  10  12  21  21
     1:  12  10  21  21
     2:  21  21  10  12
     3:  21  21  12  10

 --------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:      1056508108 kB

 --------------------------------------------------------------
 10. who -r
   run-level 3 Apr 26 17:49

 --------------------------------------------------------------
 11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)
   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 systemd-pstore wicked wickedd-auto4
                   wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

CPU2017 License: 9016

Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Apr-2024

Hardware Availability: Dec-2023

Software Availability: Dec-2023

Platform Notes (Continued)

```
    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 ndctl-monitor nfs
                     nfs-blkmap nvmf-autoconnect 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 tuned
                     udisks2 vncserver@
    indirect         wickedd

    ----------------------------------------------------------
 13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-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 4.00 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
        Supported: yes
        Active: yes

    ----------------------------------------------------------
 15. tuned-adm active
    It seems that tuned daemon is not running, preset profile is not activated.
    Preset profile: latency-performance

    ----------------------------------------------------------
 16. 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
    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

    ----------------------------------------------------------
 17. /sys/kernel/mm/transparent_hugepage
    defrag           always defer defer+madvise [madvise] never
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

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

Test Date: Apr-2024
Hardware Availability: Dec-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
   enabled         [always] madvise never
   hpage_pmd_size  2097152
   shmem_enabled   always within_size advise [never] deny force


  ----------------------------------------------------------------
18. /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


  ----------------------------------------------------------------
19. OS release
   From /etc/*-release /etc/*-version
   os-release SUSE Linux Enterprise High Performance Computing 15 SP5

  ----------------------------------------------------------------
20. Disk information
SPEC is set to: /ic24u0
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p8 xfs   1.3T  103G  1.2T   9% /

  ----------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
   Vendor:         ASUSTeK COMPUTER INC.
   Product:        RS720-E11-RS12U
   Product Family: Server
   Serial:         R1S0MD000002

  ----------------------------------------------------------------
22. dmidecode
  Additional information from dmidecode 3.4 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 M321R8GA0PB0-CWMXJ 64 GB 2 rank 5600, configured at 4800


  ----------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:        American Megatrends Inc.
   BIOS Version:       2201
   BIOS Date:          12/22/2023
   BIOS Revision:      22.1
```

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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

$SPECrate^{®}2017\_fp\_base = 708$

$SPECrate^{®}2017\_fp\_peak = 727$

CPU2017 License: 9016	**Test Date:** Apr-2024
Test Sponsor: ASUSTeK Computer Inc.	**Hardware Availability:** Dec-2023
Tested by: ASUSTeK Computer Inc.	**Software Availability:** Dec-2023

Compiler Version Notes (Continued)

```
====================================================================================================
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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------------


====================================================================================================
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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

(Continued on next page)

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

SPEC CPU®2017 Floating Point Rate Result

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

CPU2017 License: 9016		**Test Date:**	Apr-2024
Test Sponsor: ASUSTeK Computer Inc.		**Hardware Availability:**	Dec-2023
Tested by: ASUSTeK Computer Inc.		**Software Availability:**	Dec-2023

Base Compiler Invocation (Continued)

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 -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

CPU2017 License: 9016		**Test Date:**	Apr-2024
Test Sponsor:	ASUSTeK Computer Inc.	**Hardware Availability:**	Dec-2023
Tested by:	ASUSTeK Computer Inc.	**Software Availability:**	Dec-2023

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-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 -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -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 -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:
```
-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-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
```

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

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

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

Test Date: Apr-2024
Hardware Availability: Dec-2023
Software Availability: Dec-2023

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: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids
-Ofast -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512
-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 -xsapphirerapids -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:

521.wrf_r: -w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int
-mprefer-vector-width=512 -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

527.cam4_r: basepeak = yes

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720-E11-RS12U
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_fp_base = 708

SPECrate®2017_fp_peak = 727

CPU2017 License: 9016		**Test Date:**	Apr-2024
Test Sponsor:	ASUSTeK Computer Inc.	**Hardware Availability:**	Dec-2023
Tested by:	ASUSTeK Computer Inc.	**Software Availability:**	Dec-2023

Peak Optimization Flags (Continued)

Benchmarks using both C and C++:

511.povray_r: `-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs`
`-fprofile-generate`(pass 1)
`-fprofile-use=default.profdata`(pass 2) `-xCORE-AVX2`(pass 1)
`-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse`
`-funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int`
`-mprefer-vector-width=512 -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

526.blender_r: `basepeak = yes`

Benchmarks using Fortran, C, and C++:
`-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512`
`-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-V1.3.html`
`http://www.spec.org/cpu2017/flags/Intel-ic2024-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-V1.3.xml`
`http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml`

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

Tested with SPEC CPU®2017 v1.1.9 on 2024-04-26 05:51:11-0400.
Report generated on 2024-05-21 19:26:56 by CPU2017 PDF formatter v6716.
Originally published on 2024-05-21.