



SPEC CPU®2017 Floating Point Rate Result

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ASUSTeK Computer Inc.
ASUS RS720-E10-RS12(Z12PP-D32) Server System
(2.00 GHz, Intel Xeon Gold 6338)

SPECrate®2017_fp_base = 496
SPECrate®2017_fp_peak = 522

CPU2017 License: 9016

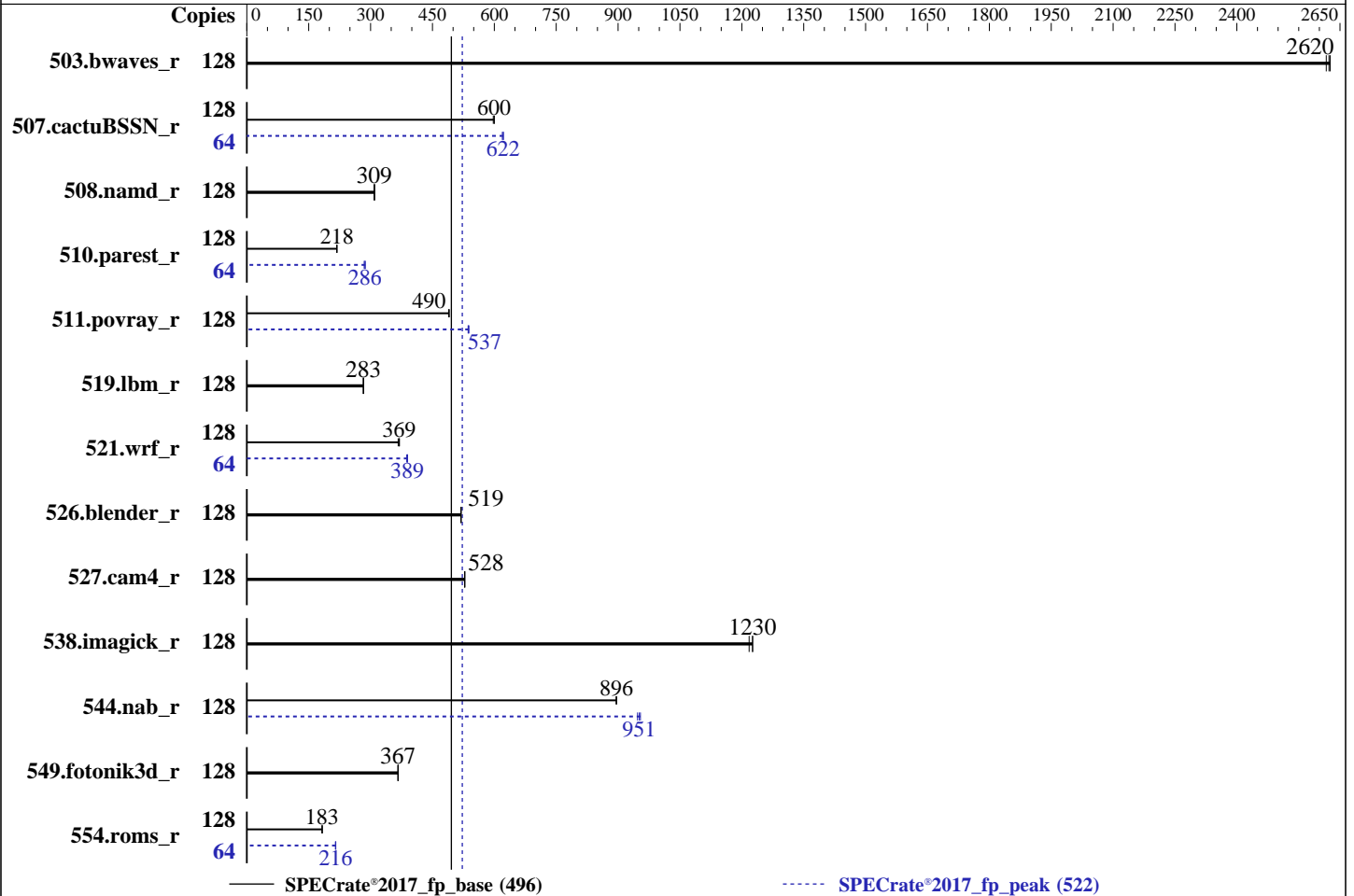
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Mar-2023

Hardware Availability: Jul-2021

Software Availability: Dec-2022



Hardware

CPU Name: Intel Xeon Gold 6338
 Max MHz: 3200
 Nominal: 2000
 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: 1.25 MB I+D on chip per core
 L3: 48 MB I+D on chip per chip
 Other: None
 Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)
 Storage: 1 x 1 TB SATA SSD
 Other: None

Software

OS: Red Hat Enterprise Linux release 8.4 (Ootpa) 4.18.0-305.25.1.el8_4.x86_64
 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 0802 released Apr-2022
 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

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	128	491	2620	<u>489</u>	<u>2620</u>	489	2630	128	491	2620	<u>489</u>	<u>2620</u>	489	2630
507.cactuBSSN_r	128	271	597	<u>270</u>	<u>600</u>	270	600	64	131	619	<u>130</u>	<u>622</u>	130	622
508.namd_r	128	394	309	392	310	<u>393</u>	<u>309</u>	128	394	309	392	310	<u>393</u>	<u>309</u>
510.parest_r	128	<u>1534</u>	<u>218</u>	1537	218	1532	219	64	583	287	<u>585</u>	<u>286</u>	589	284
511.povray_r	128	611	489	<u>610</u>	<u>490</u>	609	490	128	557	536	<u>557</u>	<u>537</u>	555	538
519.lbm_r	128	477	283	478	282	<u>477</u>	<u>283</u>	128	477	283	478	282	<u>477</u>	<u>283</u>
521.wrf_r	128	775	370	<u>776</u>	<u>369</u>	782	367	64	370	388	<u>368</u>	<u>389</u>	368	390
526.blender_r	128	<u>375</u>	<u>519</u>	375	519	375	519	128	<u>375</u>	<u>519</u>	375	519	375	519
527.cam4_r	128	<u>424</u>	<u>528</u>	424	528	424	529	128	<u>424</u>	<u>528</u>	424	528	424	529
538.imagick_r	128	<u>260</u>	<u>1230</u>	260	1230	261	1220	128	<u>260</u>	<u>1230</u>	260	1230	261	1220
544.nab_r	128	241	896	<u>240</u>	<u>896</u>	240	896	128	<u>226</u>	<u>951</u>	227	947	226	954
549.fotonik3d_r	128	1359	367	<u>1361</u>	<u>367</u>	1362	366	128	1359	367	<u>1361</u>	<u>367</u>	1362	366
554.roms_r	128	1115	182	1112	183	<u>1114</u>	<u>183</u>	64	<u>472</u>	<u>216</u>	472	216	474	215

SPECrate®2017_fp_base = **496**

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

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

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 = "/home/ic23/lib/intel64:/home/ic23/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>

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

Sysinfo program /home/ic23/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Fri Mar 31 14:13:56 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
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8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 239 (239-45.el8_4.3)
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. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS

1. uname -a
Linux localhost.localdomain 4.18.0-305.25.1.el8_4.x86_64 #1 SMP Mon Oct 18 14:34:11 EDT 2021 x86_64 x86_64

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Platform Notes (Continued)

x86_64 GNU/Linux

2. w
14:13:56 up 7:49, 1 user, load average: 77.17, 115.41, 122.76
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 06:25 7:48m 1.25s 0.00s /bin/bash ./rate.sh

3. Username
From environment variable \$USER: root

4. ulimit -a
core file size (blocks, -c) 0
data seg size (kbytes, -d) unlimited
scheduling priority (-e) 0
file size (blocks, -f) unlimited
pending signals (-i) 4126642
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) 4126642
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 18
login -- root
-bash
/bin/bash ./rate.sh
/bin/bash ./rate.sh
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/CPU2017.084/templogs/preenv.fprate.084.0.log --lognum 084.0 --from_runcpu 2
specperl \$SPEC/bin/sysinfo
\$SPEC = /home/ic23

6. /proc/cpuinfo
model name : Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHz
vendor_id : GenuineIntel
cpu family : 6
model : 106
stepping : 6
microcode : 0xd000331
bugs : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores : 32
siblings : 64

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Platform Notes (Continued)

2 physical ids (chips)
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 2.32.1:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                128
On-line CPU(s) list:  0-127
Thread(s) per core:    2
Core(s) per socket:   32
Socket(s):             2
NUMA node(s):         4
Vendor ID:             GenuineIntel
BIOS Vendor ID:       Intel
CPU family:            6
Model:                106
Model name:            Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHz
BIOS Model name:      Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHz
Stepping:              6
CPU MHz:               2590.275
CPU max MHz:           3200.0000
CPU min MHz:           800.0000
BogoMIPS:              4000.00
Virtualization:        VT-x
L1d cache:             48K
L1i cache:             32K
L2 cache:              1280K
L3 cache:              49152K
NUMA node0 CPU(s):    0-15,64-79
NUMA node1 CPU(s):    16-31,80-95
NUMA node2 CPU(s):    32-47,96-111
NUMA node3 CPU(s):    48-63,112-127
Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts
                        acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art
                        arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni
                        pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca
                        sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm
                        abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single intel_ppin ssbd mba ibrs ibpb
                        stibp ibrs_enhanced tpr_shadow vmmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust
                        bmi1 hle avx2 smep bmi2 erms invpcid 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
                        wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi
                        umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme
                        avx512_vpoperndq la57 rdpid fsrm md_clear pconfig flush_l1d arch_capabilities
```

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)

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Platform Notes (Continued)

```

node 0 cpus: 0-15,64-79
node 0 size: 257617 MB
node 0 free: 240634 MB
node 1 cpus: 16-31,80-95
node 1 size: 258003 MB
node 1 free: 245127 MB
node 2 cpus: 32-47,96-111
node 2 size: 258040 MB
node 2 free: 245579 MB
node 3 cpus: 48-63,112-127
node 3 size: 258038 MB
node 3 free: 245624 MB
node distances:
node  0  1  2  3
  0: 10 11 20 20
  1: 11 10 20 20
  2: 20 20 10 11
  3: 20 20 11 10

```

```

-----
9. /proc/meminfo
MemTotal:      1056461372 kB

```

```

-----
10. who -r
run-level 3 Mar 31 06:25

```

```

-----
11. Systemd service manager version: systemd 239 (239-45.el8_4.3)
Default Target  Status
multi-user      running

```

```

-----
12. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online atd auditd autovt@ chronyd
crond firewalld getty@ import-state insights-client-boot irqbalance iscsi iscsi-onboot kdump
libstoragemgmt lm_sensors loadmodules lvm2-monitor mcelog mdmonitor microcode multipathd
nvme-fc-boot-connections pmcd pmie pmlogger rhsmcertd rsyslog selinux-autorelabel-mark smartd sshd
sssd syslog sysstat timedatex tuned udisks2 vdo
disabled arp-ethers blk-availability chrony-wait console-getty cpupower debug-shell ebttables fancontrol
grafana-server iprdump iprinit iprupdate ipsec iscsid iscsiui kpatch kvm_stat ledmon nftables
nis-domainname nvme-fc-autoconnect oddjobd pmfind pmie-check pmlogger_daily_report
pmlogger_daily_report-poll pmproxy podman-auto-update postfix powertop psacct ras-mc-ctl
rasdaemon rdisc rhcd rhsm rhsm-facts rrdcached saslauthd serial-getty@ sshd-keygen@
systemd-resolved tcsd
indirect sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo
masked  systemd-timedated

```

```

-----
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-4.18.0-305.25.1.el8_4.x86_64
root=/dev/mapper/rhel-root
ro
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root
rd.lvm.lv=rhel/swap
rhgb
quiet

```

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Platform Notes (Continued)

14. cpupower frequency-info
analyzing CPU 0:
current policy: frequency should be within 800 MHz and 3.20 GHz.
The governor "performance" may decide which speed to use
within this range.
boost state support:
Supported: yes
Active: yes

15. tuned-adm active
Current active profile: throughput-performance

16. sysctl
kernel.numa_balancing 1
kernel.randomize_va_space 2
vm.compaction_proactiveness 0
vm.dirty_background_bytes 0
vm.dirty_background_ratio 10
vm.dirty_bytes 0
vm.dirty_expire_centisecs 3000
vm.dirty_ratio 40
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 10
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
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_swap 64
pages_to_scan 4096
scan_sleep_millisecs 10000

19. OS release
From /etc/*-release /etc/*-version
os-release Red Hat Enterprise Linux 8.4 (Ootpa)
redhat-release Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release Red Hat Enterprise Linux release 8.4 (Ootpa)

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Platform Notes (Continued)

20. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities

itlb_multihit	Not affected
lltf	Not affected
mds	Not affected
meltdown	Not affected
spec_store_bypass	Mitigation: Speculative Store Bypass disabled via prctl and seccomp
spectre_v1	Mitigation: usercopy/swapgs barriers and __user pointer sanitization
spectre_v2	Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
srbds	Not affected
tsx_async_abort	Not affected

For more information, see the Linux documentation on hardware vulnerabilities, for example <https://www.kernel.org/doc/html/latest/admin-guide/hw-vuln/index.html>

21. Disk information

SPEC is set to: /home/ic23

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/rhel-home	xfs	878G	175G	704G	20%	/home

22. /sys/devices/virtual/dmi/id

Vendor:	ASUSTeK COMPUTER INC.
Product:	RS720-E10-RS12
Product Family:	Server
Serial:	012345678901

23. 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 M393A8G40AB2-CWE 64 GB 2 rank 3200

24. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor:	American Megatrends Inc.
BIOS Version:	0802
BIOS Date:	04/29/2022
BIOS Revision:	8.2

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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Compiler Version Notes (Continued)

=====
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
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.

=====
C++, C, Fortran | 507.cactuBSSN_r(base, peak)

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Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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=====
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

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

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SPEC CPU®2017 Floating Point Rate Result

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ASUSTeK Computer Inc.
ASUS RS720-E10-RS12(Z12PP-D32) Server System
(2.00 GHz, Intel Xeon Gold 6338)

SPECrate®2017_fp_base = 496
SPECrate®2017_fp_peak = 522

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

Test Date: Mar-2023
Hardware Availability: Jul-2021
Software Availability: Dec-2022

Base Compiler Invocation (Continued)

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
```

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
```

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Base Optimization Flags (Continued)

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

Benchmarks using Fortran, C, and C++:

icpx icx ifx

Peak Portability Flags

Same as Base Portability Flags



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Software Availability: Dec-2022

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
```

Benchmarks using both Fortran and C:

```
521.wrf_r: -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
```

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

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Peak Optimization Flags (Continued)

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

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-z12-V1.2.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-z12-V1.2.xml>
<http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml>

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