



SPEC CPU®2017 Integer Rate Result

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KTNF

(Test Sponsor: Telecommunications Technology Association)

KTNF KR580S3

(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 932

SPECrate®2017_int_peak = Not Run

CPU2017 License: A83

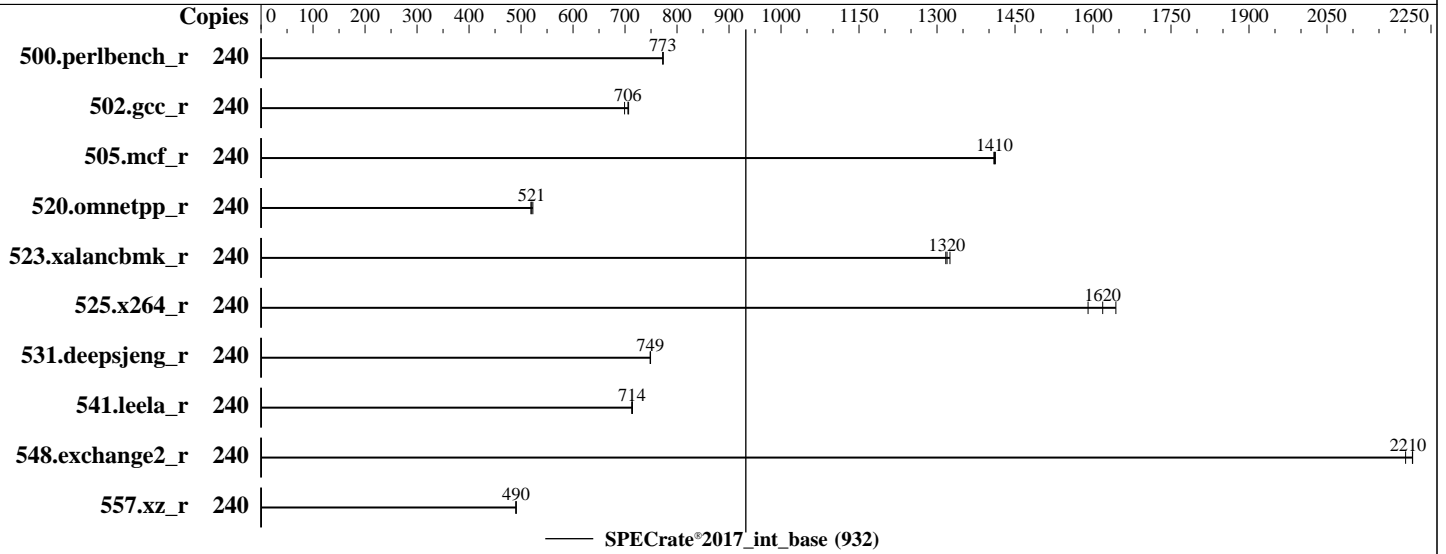
Test Sponsor: Telecommunications Technology Association

Tested by: Telecommunications Technology Association

Test Date: Nov-2024

Hardware Availability: Jun-2024

Software Availability: Jul-2024



Hardware

CPU Name: Intel Xeon Platinum 8490H
 Max MHz: 3500
 Nominal: 1900
 Enabled: 120 cores, 2 chips, 2 threads/core
 Orderable: 1,2 chips
 Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 112.5 MB I+D on chip per chip
 Other: None
 Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
 Storage: 1 x 500 GB SATA HDD, 7200RPM
 Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
 5.14.0-70.22.1.el9_0.x86_64
 Compiler: C/C++: Version 2024.2.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2024.2.1 of Intel Fortran Compiler for Linux;
 Parallel: No
 Firmware: Version 5.32 released Jun-2024
 File System: xfs
 System State: Run level 5 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: Not Applicable
 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
500.perlbench_r	240	494	773	494	773	494	773							
502.gcc_r	240	481	707	486	699	482	706							
505.mcf_r	240	275	1410	275	1410	275	1410							
520.omnetpp_r	240	605	521	607	519	602	523							
523.xalancbmk_r	240	191	1320	192	1320	192	1320							
525.x264_r	240	264	1590	256	1640	260	1620							
531.deepsjeng_r	240	367	749	368	748	367	749							
541.leela_r	240	557	714	556	714	557	713							
548.exchange2_r	240	284	2210	286	2200	284	2210							
557.xz_r	240	528	491	528	490	529	490							

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

Submit Notes

The config file option 'submit' was used.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:

LD_LIBRARY_PATH =

"/home/spec/SPECcpu2017-1.1.9/lib/intel64:/home/spec/SPECcpu2017-1.1.9/lib/ia32:/home/spec/SPECcpu2017-1.1.9/je5.0.1-32"

MALLOC_CONF = "retain:true"

General Notes

Binaries were compiled on a system with 2x Intel Xeon Platinum 8490H CPU + 1TiB Memory using RHEL 9.0

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.

Submitted: Wed Nov 6 20:57:30 EST 2024

Submission: cpu2017-20241105-45395.sub

Submitted: Fri Nov 15 21:42:23 EST 2024

Submission: cpu2017-20241105-45395.sub

Submitted: Mon Nov 18 19:43:39 EST 2024

Submission: cpu2017-20241105-45395.sub

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General Notes (Continued)

Submitted: Mon Nov 18 19:47:31 EST 2024

Submission: cpu2017-20241105-45395.sub

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 /home/spec/SPECcpu2017-1.1.9/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Tue Nov 5 11:35:37 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 250 (250-6.e19_0)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent_hugepage
19. /sys/kernel/mm/transparent_hugepage/khugepaged
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS

1. uname -a
Linux localhost.localdomain 5.14.0-70.22.1.e19_0.x86_64 #1 SMP PREEMPT Tue Aug 2 10:02:12 EDT 2022 x86_64
x86_64 x86_64 GNU/Linux

2. w
11:35:37 up 5 days, 1:56, 1 user, load average: 0.16, 0.07, 0.01

USER	TTY	LOGIN@	IDLE	JCPU	PCPU	WHAT
tta	pts/0	Thu09	7.00s	1.26s	0.17s	sshd: tta [priv]

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Platform Notes (Continued)

3. Username

```
From environment variable $USER: spec
From the command 'logname': tta
```

4. ulimit -a

```
real-time non-blocking time (microseconds, -R) unlimited
core file size (blocks, -c) 0
data seg size (kbytes, -d) unlimited
scheduling priority (-e) 0
file size (blocks, -f) unlimited
pending signals (-i) 4124485
max locked memory (kbytes, -l) 800000000
max memory size (kbytes, -m) unlimited
open files (-n) 800000000
pipe size (512 bytes, -p) 8
POSIX message queues (bytes, -q) 819200
real-time priority (-r) 0
stack size (kbytes, -s) 8192
cpu time (seconds, -t) unlimited
max user processes (-u) unlimited
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited
```

5. sysinfo process ancestry

```
/usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: tta [priv]
sshd: tta@pts/0
-bash
su - spec
-bash
runcpu --action validate --define default-platform-flags --define numcopies=240 -c tta_new_peak --define
smt-on --define cores=120 --define physicalfirst --define invoke_with_interleave --define drop_caches
--tune base -o all intrate
runcpu --action validate --define default-platform-flags --define numcopies=240 --configfile tta_new_peak
--define smt-on --define cores=120 --define physicalfirst --define invoke_with_interleave --define
drop_caches --tune base --output_format all --nopower --runmode rate --tune base --size refrate intrate
--nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.101/temlogs/preenv.intrate.101.0.log --lognum 101.0
--from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/spec/SPECcpu2017-1.1.9
```

6. /proc/cpuinfo

```
model name      : Intel(R) Xeon(R) Platinum 8490H
vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping       : 8
microcode      : 0x2b000571
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores      : 60
siblings       : 120
2 physical ids (chips)
240 processors (hardware threads)
physical id 0: core ids 0-59
```

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Platform Notes (Continued)

physical id 1: core ids 0-59
physical id 0: apicids 0-119
physical id 1: apicids 128-247

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):                240
On-line CPU(s) list:  0-239
Vendor ID:             GenuineIntel
Model name:            Intel(R) Xeon(R) Platinum 8490H
CPU family:            6
Model:                 143
Thread(s) per core:   2
Core(s) per socket:   60
Socket(s):             2
Stepping:              8
CPU max MHz:           3500.0000
CPU min MHz:           800.0000
BogoMIPS:              3800.00
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 ad_fsgsbase tsc_adjust bmlil 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 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_lld arch_capabilities

```

```

Virtualization:        VT-x
L1d cache:             5.6 MiB (120 instances)
L1i cache:             3.8 MiB (120 instances)
L2 cache:              240 MiB (120 instances)
L3 cache:              225 MiB (2 instances)
NUMA node(s):         8
NUMA node0 CPU(s):    0-14,120-134
NUMA node1 CPU(s):    15-29,135-149
NUMA node2 CPU(s):    30-44,150-164
NUMA node3 CPU(s):    45-59,165-179
NUMA node4 CPU(s):    60-74,180-194
NUMA node5 CPU(s):    75-89,195-209
NUMA node6 CPU(s):    90-104,210-224
NUMA node7 CPU(s):    105-119,225-239
Vulnerability Itlb multihit: Not affected

```

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Platform Notes (Continued)

Vulnerability L1tf: Not affected
 Vulnerability Mds: Not affected
 Vulnerability Meltdown: Not affected
 Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
 Vulnerability Spectre v1: Mitigation; usercopy/swaps 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	5.6M	12	Data	1	64	1	64
L1i	32K	3.8M	8	Instruction	1	64	1	64
L2	2M	240M	16	Unified	2	2048	1	64
L3	112.5M	225M	15	Unified	3	122880	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: 0-14,120-134
node 0 size: 128115 MB
node 0 free: 120126 MB
node 1 cpus: 15-29,135-149
node 1 size: 128981 MB
node 1 free: 123258 MB
node 2 cpus: 30-44,150-164
node 2 size: 129017 MB
node 2 free: 120467 MB
node 3 cpus: 45-59,165-179
node 3 size: 129017 MB
node 3 free: 123326 MB
node 4 cpus: 60-74,180-194
node 4 size: 129017 MB
node 4 free: 123358 MB
node 5 cpus: 75-89,195-209
node 5 size: 129017 MB
node 5 free: 123335 MB
node 6 cpus: 90-104,210-224
node 6 size: 129017 MB
node 6 free: 123326 MB
node 7 cpus: 105-119,225-239
node 7 size: 128997 MB
node 7 free: 123164 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: 1055930712 kB

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Platform Notes (Continued)

10. who -r
run-level 5 2024-10-31 09:40

11. Systemd service manager version: systemd 250 (250-6.el9_0)
Default Target Status
graphical degraded

12. Failed units, from systemctl list-units --state=failed
UNIT LOAD ACTIVE SUB DESCRIPTION
* sep5.service loaded failed failed systemd script to load sep5 driver at boot time

13. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker firewallld
gdm getty@ insights-client-boot irqbalance iscsi iscsi-onboot kdump libstoragemgmt
low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname
nvme-fc-boot-connections ostree-remount power-profiles-daemon gemu-guest-agent rhsmcertd
rsyslog rtkit-daemon selinux-autorelabel-mark sep5 smartd sshd sssd switcheroo-control
systemd-network-generator tuned udisks2 upower vgauthd vmtoolsd
enabled-runtime systemd-remount-fs
disabled arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown
canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed
dbus-daemon debug-shell dnsmasq iprddump iprprint iprupdate iscsid iscsiuiop kpatch kvm_stat
ledmon man-db-restart-cache-update nftables nvme-autoconnect podman podman-auto-update
podman-restart psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts rpmbd-rebuild
serial-getty@ speech-dispatcherd sshd-keygen@ systemd-boot-check-no-failures
systemd-pstore systemd-sysexec wpa_supplicant
indirect spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

14. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.22.1.el9_0.x86_64
root=/dev/mapper/rhel-root
ro
crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root
rd.lvm.lv=rhel/swap
rhgb
quiet

15. cpupower frequency-info
analyzing CPU 0:
current policy: frequency should be within 800 MHz and 3.50 GHz.
The governor "performance" may decide which speed to use
within this range.
boost state support:
Supported: yes
Active: yes

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

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Platform Notes (Continued)

17. 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

```

18. /sys/kernel/mm/transparent_hugepage

```

defrag      always defer defer+madvice [madvice] never
enabled     [always] madvice never
hpage_pmd_size 2097152
shmem_enabled always within_size advise [never] deny force

```

19. /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

```

20. OS release

```

From /etc/*-release /etc/*-version
os-release      Red Hat Enterprise Linux 9.0 (Plow)
redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
system-release Red Hat Enterprise Linux release 9.0 (Plow)

```

21. Disk information

SPEC is set to: /home/spec/SPECcpu2017-1.1.9

```

Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   390G   69G  322G  18% /home

```

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

```

Vendor:      KTNF Co.,Ltd.
Product:     KM-P680
Product Family: Family

```

23. dmidecode

Additional information from dmidecode 3.3 follows. WARNING: Use caution when you interpret this section.

(Continued on next page)



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Platform Notes (Continued)

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-CQKDS 64 GB 2 rank 4800

24. BIOS

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

BIOS Vendor: American Megatrends International, LLC.

BIOS Version: P680KTFPS.29

BIOS Date: 06/04/2024

BIOS Revision: 5.32

Compiler Version Notes

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.2.1 Build 20240711
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.2.1 Build 20240711
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

=====
Fortran | 548.exchange2_r(base)
=====

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.2.1 Build 20240711
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx



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Base Portability Flags

```
500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64
```

Base Optimization Flags

C benchmarks:

```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/spec/SPECcpu2017-1.1.9/lib/intel64 -lqkmalloc
```

C++ benchmarks:

```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/spec/SPECcpu2017-1.1.9/lib/intel64 -lqkmalloc
```

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/home/spec/SPECcpu2017-1.1.9/lib/intel64 -lqkmalloc
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/KTNF-Platform-Flags-Version-KM-P680-10B1-SA2.html>

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.2024-12-02.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/KTNF-Platform-Flags-Version-KM-P680-10B1-SA2.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.2024-12-02.xml>

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

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