



SPEC CPU®2017 Floating Point Speed Result

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New H3C Technologies Co., Ltd.
H3C UniServer R4900 G6 Ultra (Intel Xeon Gold 6542Y)

SPECspeed®2017_fp_base = 333

SPECspeed®2017_fp_peak = 333

CPU2017 License: 9066

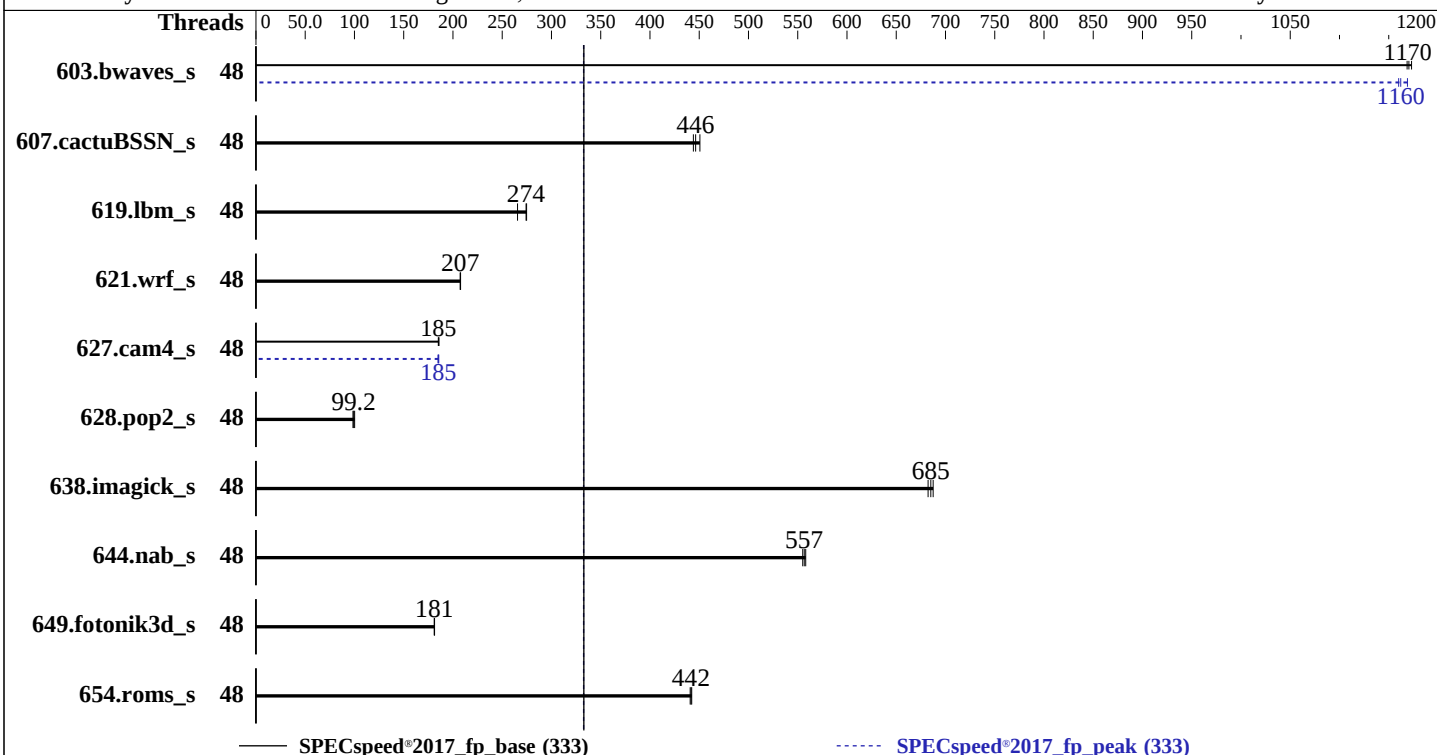
Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Apr-2025

Hardware Availability: Oct-2023

Software Availability: Mar-2024



Hardware

CPU Name: Intel Xeon Gold 6542Y
Max MHz: 4100
Nominal: 2900
Enabled: 48 cores, 2 chips
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: 60 MB I+D on chip per chip
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-5600B-R, running at 5200)
Storage: 1 x 3.84 TB NVME SSD
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP5
5.14.21-150500.53-default
Compiler: C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;
Parallel: Yes
Firmware: Version 6.10.50 released Feb-2025 BIOS
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						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	48	50.4	1170	50.3	1170	50.5	1170	48	50.9	1160	50.5	1170	50.8	1160
607.cactuBSSN_s	48	37.0	451	37.3	446	37.5	444	48	37.0	451	37.3	446	37.5	444
619.lbm_s	48	19.1	275	19.1	274	19.7	266	48	19.1	275	19.1	274	19.7	266
621.wrf_s	48	63.7	207	63.7	208	63.8	207	48	63.7	207	63.7	208	63.8	207
627.cam4_s	48	47.8	185	47.7	186	47.9	185	48	48.0	185	47.8	185	47.8	186
628.pop2_s	48	121	98.5	119	100	120	99.2	48	121	98.5	119	100	120	99.2
638.imagick_s	48	21.1	682	21.1	685	21.0	687	48	21.1	682	21.1	685	21.0	687
644.nab_s	48	31.4	557	31.5	555	31.3	558	48	31.4	557	31.5	555	31.3	558
649.fotonik3d_s	48	50.4	181	50.3	181	50.3	181	48	50.4	181	50.3	181	50.3	181
654.roms_s	48	35.6	442	35.6	442	35.7	441	48	35.6	442	35.6	442	35.7	441

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

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Environment Variables Notes

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

KMP_AFFINITY = "granularity=fine,compact"

LD_LIBRARY_PATH = "/home/speccpunew/lib/intel64:/home/speccpunew/je5.0.1-64"

MALLOC_CONF = "retain:true"

OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM

memory using Redhat Enterprise Linux 8.0

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

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 Settings:

Enable LP [Global] = Single LP

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Platform Notes (Continued)

SNC = Disabled
Package C State = C6(Retention) state
LLC Prefetch = Enabled
BMC Settings:
Fan mode = powerful mode

Sysinfo program /home/speccpunew/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Apr 15 13:56:21 2025

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

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10. who -r
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12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
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18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
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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

2. w
13:56:21 up 3 min, 1 user, load average: 0.05, 0.08, 0.03
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 13:55 13.00s 1.06s 0.00s sh speed.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

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Platform Notes (Continued)

file size (blocks, -f) unlimited
pending signals (-i) 4126722
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) 4126722
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
sh speed.sh
runcpu --nobuild --action validate --define default-platform-flags -c
ic2024.1-lin-sapphirerapids-speed-20240308.cfg --define cores=48 --tune base,peak -o all --define
drop_caches fpspeed
runcpu --nobuild --action validate --define default-platform-flags --configfile
ic2024.1-lin-sapphirerapids-speed-20240308.cfg --define cores=48 --tune base,peak --output_format all
--define drop_caches --nopower --runmode speed --tune base:peak --size refspeak fpspeed --nopreenv
--note-preenv --logfile $SPEC/tmp/CPU2017.011/temlogs/preenv.fpspeed.011.0.log --lognum 011.0
--from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/speccpunew
```

6. /proc/cpuinfo

```
model name      : INTEL(R) XEON(R) GOLD 6542Y
vendor_id       : GenuineIntel
cpu family      : 6
model           : 207
stepping        : 2
microcode       : 0x21000291
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
cpu cores       : 24
siblings        : 24
2 physical ids (chips)
48 processors (hardware threads)
physical id 0:  core ids 0-23
physical id 1:  core ids 0-23
physical id 0:  apicids 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46
physical id 1:  apicids
128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174
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: 52 bits physical, 57 bits virtual
Byte Order: Little Endian

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Platform Notes (Continued)

CPU(s): 48
On-line CPU(s) list: 0-47
Vendor ID: GenuineIntel
Model name: INTEL(R) XEON(R) GOLD 6542Y
CPU family: 6
Model: 207
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2
Stepping: 2
CPU max MHz: 4100.0000
CPU min MHz: 800.0000
BogoMIPS: 1600.00
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 aperfperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl 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 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 hfi 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
L1d cache: 2.3 MiB (48 instances)
L1i cache: 1.5 MiB (48 instances)
L2 cache: 96 MiB (48 instances)
L3 cache: 120 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-23
NUMA node1 CPU(s): 24-47
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
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, PBRBSB-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	2.3M	12	Data	1	64	1	64
L1i	32K	1.5M	8	Instruction	1	64	1	64
L2	2M	96M	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.

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Platform Notes (Continued)

```
available: 2 nodes (0-1)
node 0 cpus: 0-23
node 0 size: 515632 MB
node 0 free: 514757 MB
node 1 cpus: 24-47
node 1 size: 516077 MB
node 1 free: 514948 MB
node distances:
node  0  1
  0:  10  21
  1:  21  10
```

```
-----
9. /proc/meminfo
MemTotal:      1056471504 kB
```

```
-----
10. who -r
run-level 3 Apr 15 13:53
```

```
-----
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 cron display-manager getty@ issue-generator
kbdsettings klog lvm2-monitor nsd nvme-fc-boot-connections purge-kernels rollback rsyslog
smartd sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime systemd-remount-fs
disabled auditd autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates
chrony-wait chronyd console-getty cups cups-browsed debug-shell ebtables
exchange-bmc-os-info fancontrol firewalld gpm grub2-once haveged haveged-switch-root ipmi
ipmievdev irqbalance issue-add-ssh-keys kdump kdump-early kexec-load lm_sensors lunmask
man-db-create multipathd ndctl-monitor nfs nfs-blkmap nmb nvme-f-autoconnect postfix rpcbind
rpmconfigcheck rsyncd serial-getty@ smartd-generate_opts smb snmpd snmptrapd svnserv
sysstat systemd-boot-check-no-failures systemd-network-generator systemd-sysext
systemd-time-wait-sync systemd-timesyncd tuned vncserver@
indirect pcsd wickedd
```

```
-----
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
root=UUID=befab1a9-6492-412a-9d0b-079466ad03eb
splash=silent
resume=/dev/disk/by-uuid/64b85326-8619-4fcb-8127-1e8683bd7471
mitigations=auto
quiet
splash=silent
mitigations=auto
```

```
-----
14. cpupower frequency-info
analyzing CPU 0:
current policy: frequency should be within 800 MHz and 4.10 GHz.
The governor "performance" may decide which speed to use
within this range.
boost state support:
```

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Platform Notes (Continued)

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	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	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+madvice [madvice] never
enabled	[always] madvice 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 Server 15 SP5

20. Disk information

SPEC is set to: /home/speccpunew

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/nvme0n1p5	xfs	522G	206G	317G	40%	/home

21. /sys/devices/virtual/dmi/id

Vendor: New H3C Technologies Co., Ltd.

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Platform Notes (Continued)

Product: H3C UniServer R4900 G6 Ultra

Product Family: Rack

Serial: 210235A4CHH244000019

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 Hynix HMC94AGBRA179N 64 GB 2 rank 5600, configured at 5200

23. BIOS

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

BIOS Vendor: American Megatrends International, LLC.

BIOS Version: 6.10.50

BIOS Date: 02/28/2025

BIOS Revision: 5.32

Compiler Version Notes

=====
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

=====
C++, C, Fortran | 607.cactuBSSN_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

=====
Fortran | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

=====
Fortran, C | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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Base Compiler Invocation

C benchmarks:

icx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

Base Portability Flags

603.bwaves_s: -DSPEC_LP64

607.cactuBSSN_s: -DSPEC_LP64

619.lbm_s: -DSPEC_LP64

621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian

627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG

628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian

-assume byterecl

638.imagick_s: -DSPEC_LP64

644.nab_s: -DSPEC_LP64

649.fotonik3d_s: -DSPEC_LP64

654.roms_s: -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 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:

-w -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both Fortran and C:

-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math

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SPECspeed®2017_fp_peak = 333

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Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Apr-2025

Hardware Availability: Oct-2023

Software Availability: Mar-2024

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):

-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, 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 -fiopenmp -DSPEC_OPENMP -Wno-implicit-int
-mprefer-vector-width=512 -nostandard-realloc-lhs -align array32byte
-auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Peak Compiler Invocation

C benchmarks:

icx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: basepeak = yes

638.imagick_s: basepeak = yes

(Continued on next page)



SPEC CPU®2017 Floating Point Speed Result

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New H3C Technologies Co., Ltd.
H3C UniServer R4900 G6 Ultra (Intel Xeon Gold 6542Y)

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Peak Optimization Flags (Continued)

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: -w -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xsapphirerapids
-Ofast -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc

649.fotonik3d_s: basepeak = yes

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: -w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

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

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

http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-intel-RevB.html

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

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

http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-intel-RevB.xml

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