



SPEC CPU®2017 Integer Speed Result

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New H3C Technologies Co., Ltd.

SPECspeed®2017_int_base = 11.8

H3C UniServer R3900 G7 (Intel Xeon 6979P)

SPECspeed®2017_int_peak = Not Run

CPU2017 License: 9066

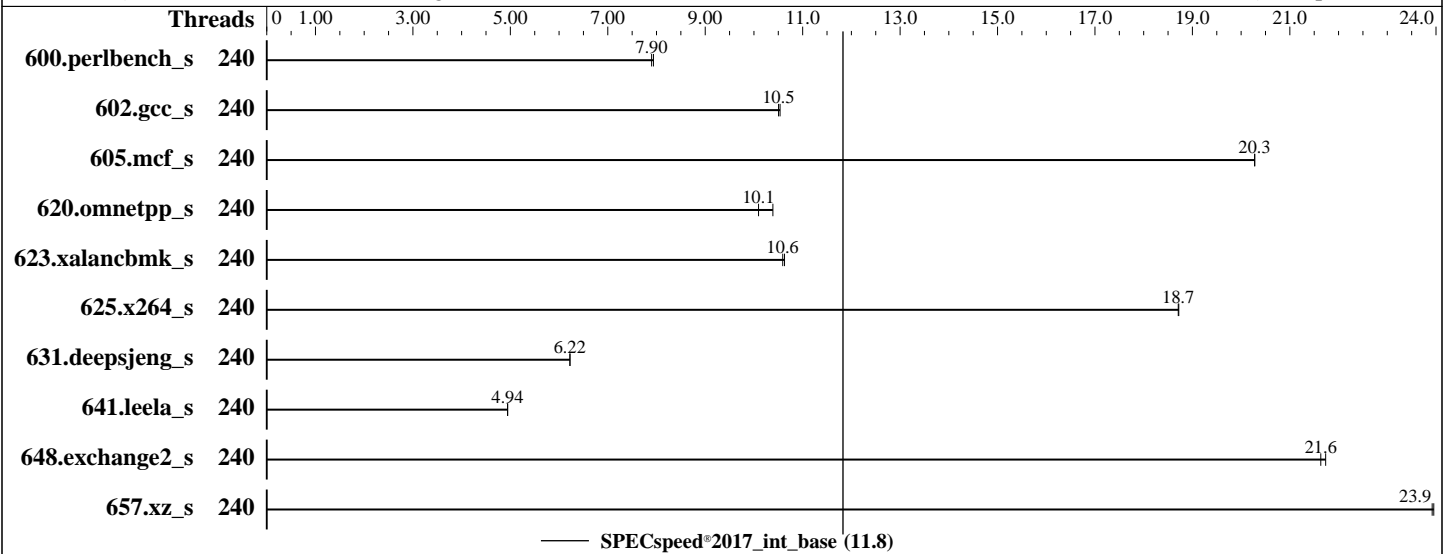
Test Date: Oct-2024

Test Sponsor: New H3C Technologies Co., Ltd.

Hardware Availability: Oct-2024

Tested by: New H3C Technologies Co., Ltd.

Software Availability: Apr-2024



Hardware

CPU Name: Intel Xeon 6979P
 Max MHz: 3900
 Nominal: 2100
 Enabled: 120 cores, 1 chip, 2 threads/core
 Orderable: 1 chip
 Cache L1: 64 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 504 MB I+D on chip per chip
 Other: None
 Memory: 768 GB (12 x 64 GB 2Rx4 PC5-11200B-R, running at 8800)
 Storage: 1 x 3.84 TB NVME SSD
 Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.4 (Plow)
 5.14.0-427.13.1.el9_4.x86_64
 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 7.10.01P91 released Sep-2024 BIOS
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 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 |
| 600.perlbench_s | 240 | 224 | 7.94 | <u>225</u> | <u>7.90</u> | | | | | | | | | |
| 602.gcc_s | 240 | <u>379</u> | <u>10.5</u> | 378 | 10.5 | | | | | | | | | |
| 605.mcf_s | 240 | <u>233</u> | <u>20.3</u> | 233 | 20.3 | | | | | | | | | |
| 620.omnetpp_s | 240 | <u>162</u> | <u>10.1</u> | 157 | 10.4 | | | | | | | | | |
| 623.xalancbmk_s | 240 | 133 | 10.6 | <u>134</u> | <u>10.6</u> | | | | | | | | | |
| 625.x264_s | 240 | 94.2 | 18.7 | <u>94.3</u> | <u>18.7</u> | | | | | | | | | |
| 631.deepsjeng_s | 240 | 230 | 6.22 | <u>230</u> | <u>6.22</u> | | | | | | | | | |
| 641.leela_s | 240 | 345 | 4.94 | <u>345</u> | <u>4.94</u> | | | | | | | | | |
| 648.exchange2_s | 240 | 135 | 21.7 | <u>136</u> | <u>21.6</u> | | | | | | | | | |
| 657.xz_s | 240 | <u>258</u> | <u>23.9</u> | 258 | 24.0 | | | | | | | | | |

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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,scatter"
LD_LIBRARY_PATH = "/home/speccpu/lib/intel64:/home/speccpu/je5.0.1-64"
MALLOCONF = "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
```

numactl --interleave=all runcpu <etc>
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>



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Platform Notes

BIOS Settings:

LLC dead line alloc = Disabled
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Performance

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Mon Oct 7 21:08:05 2024

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

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23. BIOS

```
1. uname -a
Linux localhost.localdomain 5.14.0-427.13.1.el9_4.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 10 10:29:16 EDT
2024 x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
21:08:05 up 6:09, 3 users, load average: 0.00, 8.91, 82.33
USER      TTY      LOGIN@  IDLE   JCPU   PCPU   WHAT
root     tty1      15:00    6:08m  0.00s  0.00s  -bash
root     pts/0    15:00    21.00s  0.98s  0.00s  sh speed.sh
root     pts/1    15:38    4:35m  0.05s  0.05s  -bash
```

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

```
4. ulimit -a
real-time non-blocking time (microseconds, -R) unlimited
core file size (blocks, -c) 0
```

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Platform Notes (Continued)

```

data seg size          (kbytes, -d) unlimited
scheduling priority    (-e) 0
file size              (blocks, -f) unlimited
pending signals        (-i) 3092092
max locked memory      (kbytes, -l) 8192
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) 3092092
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: root [priv]
sshd: root@pts/0
-bash
sh speed.sh
runcpu --nobuild --action validate --define default-platform-flags -c
ic2024.1-lin-sierraforest-speed-20240308.cfg --define cores=240 --tune base -o all --define
intspeedaffinity --define smt-on --define drop_caches intspeed -n 2
runcpu --nobuild --action validate --define default-platform-flags --configfile
ic2024.1-lin-sierraforest-speed-20240308.cfg --define cores=240 --tune base --output_format all --define
intspeedaffinity --define smt-on --define drop_caches --iterations 2 --nopower --runmode speed --tune base
--size refspeed intspeed --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.028/templots/preenv.intspeed.028.0.log --lognum 028.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/speccpu

```

```

-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) 6979P
vendor_id      : GenuineIntel
cpu family     : 6
model          : 173
stepping       : 1
microcode      : 0x810002e0
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores      : 120
siblings       : 240
1 physical ids (chips)
240 processors (hardware threads)
physical id 0: core ids 0-39,64-103,128-167
physical id 0: apicids 0-79,128-207,256-335
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

```

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Platform Notes (Continued)

```

Byte Order: Little Endian
CPU(s): 240
On-line CPU(s) list: 0-239
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation
Model name: Intel(R) Xeon(R) 6979P
BIOS Model name: Intel(R) Xeon(R) 6979P
CPU family: 6
Model: 173
Thread(s) per core: 2
Core(s) per socket: 120
Socket(s): 1
Stepping: 1
CPU(s) scaling MHz: 82%
CPU max MHz: 3900.0000
CPU min MHz: 800.0000
BogoMIPS: 4200.00
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb
rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl
xtopology nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq
dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm
pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2
cdp_l3 cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2
erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt
xsavce 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 vnni 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 ibt amx_bf16
avx512_fp16 amx_tile amx_int8 flush_lld arch_capabilities
Virtualization: VT-x
L1d cache: 5.6 MiB (120 instances)
L1i cache: 7.5 MiB (120 instances)
L2 cache: 240 MiB (120 instances)
L3 cache: 504 MiB (1 instance)
NUMA node(s): 3
NUMA node0 CPU(s): 0-39,120-159
NUMA node1 CPU(s): 40-79,160-199
NUMA node2 CPU(s): 80-119,200-239
Vulnerability Gather data sampling: Not affected
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 rstack overflow: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS, IBPB conditional, RSB filling,
PBRSE-eIBRS Not affected
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

```

From lscpu --cache:

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Platform Notes (Continued)

| NAME | ONE-SIZE | ALL-SIZE | WAYS | TYPE | LEVEL | SETS | PHY-LINE | COHERENCY-SIZE |
|------|----------|----------|------|-------------|-------|--------|----------|----------------|
| L1d | 48K | 5.6M | 12 | Data | 1 | 64 | 1 | 64 |
| L1i | 64K | 7.5M | 16 | Instruction | 1 | 64 | 1 | 64 |
| L2 | 2M | 240M | 16 | Unified | 2 | 2048 | 1 | 64 |
| L3 | 504M | 504M | 16 | Unified | 3 | 516096 | 1 | 64 |

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

```
available: 3 nodes (0-2)
node 0 cpus: 0-39,120-159
node 0 size: 257087 MB
node 0 free: 231762 MB
node 1 cpus: 40-79,160-199
node 1 size: 257986 MB
node 1 free: 235692 MB
node 2 cpus: 80-119,200-239
node 2 size: 258012 MB
node 2 free: 234944 MB
node distances:
node  0  1  2
 0:  10  12  12
 1:  12  10  12
 2:  12  12  10
```

9. /proc/meminfo

MemTotal: 791640580 kB

10. who -r

run-level 3 Oct 7 14:59

11. Systemd service manager version: systemd 252 (252-32.el9_4)

```
Default Target Status
multi-user      running
```

12. 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 firewalld
gdm getty@ insights-client-boot irqbalance iscsi-onboot iscsi-starter kdump libstoragemgmt
lm_sensors low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd
nis-domainname nvme-fc-boot-connections ostree-remount power-profiles-daemon
gemu-guest-agent rhsmcertd rpcbind rsyslog rtkit-daemon selinux-autorelabel-mark smartd
sshd sssd switcheroo-control sysstat systemd-boot-update 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 chronyd-restricted console-getty cpupower
cups-browsed dbus-daemon debug-shell dnf-system-upgrade dnsmasq fancontrol gssproxy
iprdump iprinit iprupdate ipsec iscsi-init iscsid iscsiuiop kpatch kvm_stat ledmon
man-db-restart-cache-update netavark-dhcp-proxy netavark-firewalld-reload nfs-blkmap
nfs-server nftables nvme-autoconnect ostree-readonly-sysroot-migration
ostree-state-overlay@ pesign podman podman-auto-update podman-clean-transient podman-kube@
podman-restart psacct rdisc rhcd rhsm rhsm-facts rpmdb-rebuild
selinux-check-proper-disable serial-getty@ speech-dispatcherd sshd-keygen@
systemd-boot-check-no-failures systemd-pstore systemd-sysexth thermald wpa_supplicant
```

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Platform Notes (Continued)

indirect iscsi spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo
systemd-sysupdate systemd-sysupdate-reboot

13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-427.13.1.el9_4.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

14. cpupower frequency-info
analyzing CPU 196:
current policy: frequency should be within 800 MHz and 3.90 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 20
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+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

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Platform Notes (Continued)

```

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 Red Hat Enterprise Linux 9.4 (Plow)
redhat-release Red Hat Enterprise Linux release 9.4 (Plow)
system-release Red Hat Enterprise Linux release 9.4 (Plow)

```

20. Disk information

```

SPEC is set to: /home/speccpu
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 3.5T 145G 3.3T 5% /home

```

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

```

Vendor: New H3C Technologies Co., Ltd.
Product: H3C UniServer R3900 G7
Serial: 210235A526H249000006

```

22. dmidecode

Additional information from dmidecode 3.5 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:

```

10x Samsung M327R8GA0PB0-CLVEM 64 GB 2 rank 11200, configured at 8800
2x Samsung M327R8GA0PB0-CLVFM 64 GB 2 rank 11200, configured at 8800

```

23. BIOS

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

```

BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 7.10.01P91
BIOS Date: 09/25/2024
BIOS Revision: 5.35
Firmware Revision: 1.16

```

Compiler Version Notes

```

=====
C | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)
=====

```

```

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++ | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)
=====

```

(Continued on next page)



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Compiler Version Notes (Continued)

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.

Fortran | 648.exchange2_s(base)

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.

Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

-w -std=c11 -m64 -Wl,-z,muldefs -xsierraforest -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:

-w -std=c++14 -m64 -Wl,-z,muldefs -xsierraforest -O3 -ffast-math

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017_int_base = 11.8

H3C UniServer R3900 G7 (Intel Xeon 6979P)

SPECspeed®2017_int_peak = Not Run

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Oct-2024

Hardware Availability: Oct-2024

Software Availability: Apr-2024

Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xsierraforest -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

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-V1.0-SPR-RevE.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-V1.0-SPR-RevE.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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