



SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

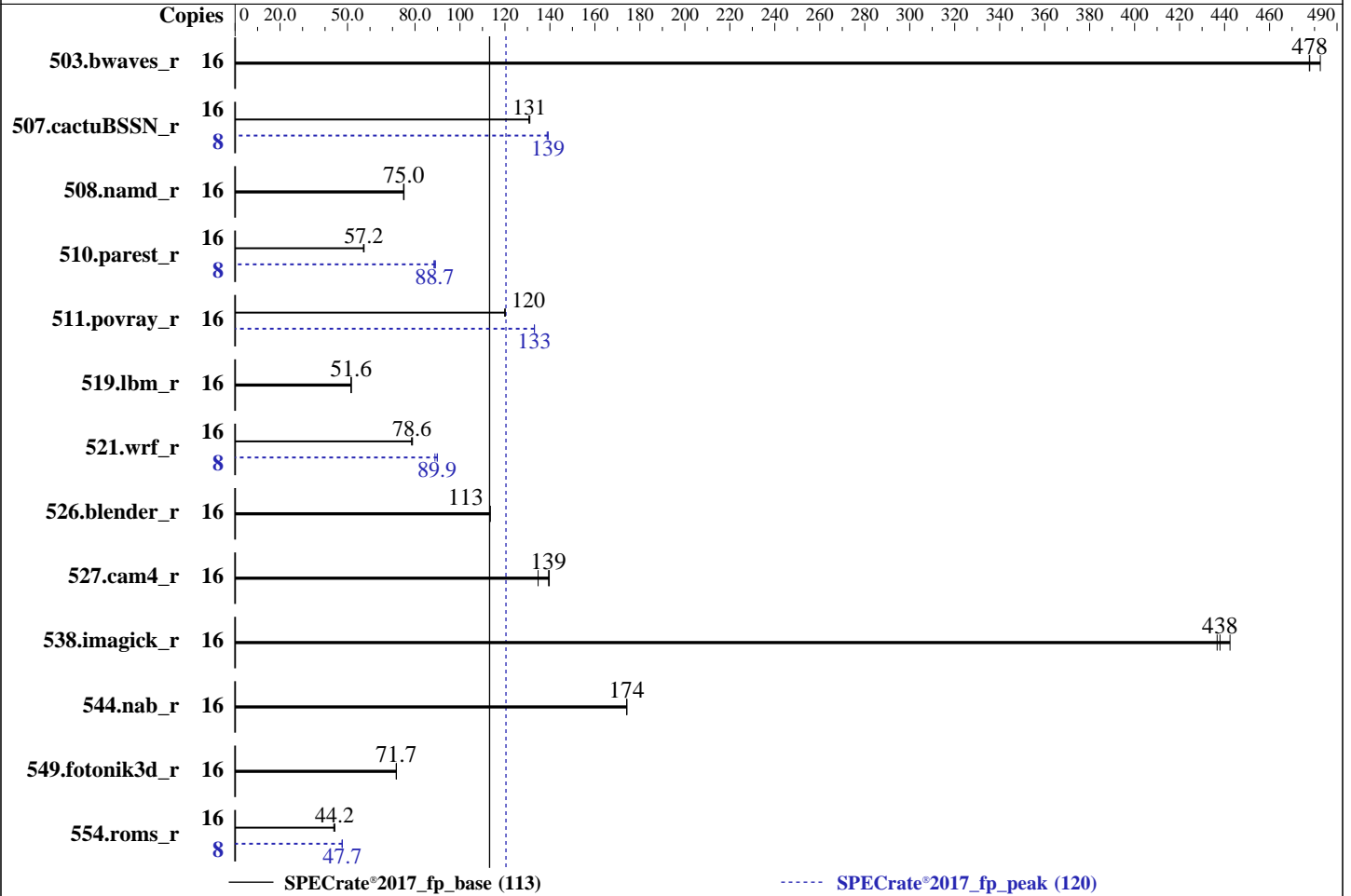
ProLiant MicroServer Gen11
(3.00 GHz, Intel Xeon 6357P)

SPECrate®2017_fp_base = 113

SPECrate®2017_fp_peak = 120

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Feb-2025
Hardware Availability: Mar-2025
Software Availability: Apr-2024



Hardware

CPU Name: Intel Xeon 6357P
 Max MHz: 5400
 Nominal: 3000
 Enabled: 8 cores, 1 chip, 2 threads/core
 Orderable: 1 chip
 Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 24 MB I+D on chip per chip
 Other: None
 Memory: 64 GB (2 x 32 GB 2Rx8 PC5-5600B-E, running at 4400, orderable using HPE part# P64339-B21)
 Storage: 1 x 1 TB 7.2 K SATA HDD
 Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.4 (Plow)
 Kernel 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: No
 Firmware: HPE BIOS Version v2.10 12/06/2024 released Dec-2024
 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 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	16	332	483	336	478	336	478	16	332	483	336	478	336	478
507.cactuBSSN_r	16	155	131	155	131	155	131	8	72.8	139	72.8	139	73.0	139
508.namd_r	16	203	74.9	203	75.0	202	75.1	16	203	74.9	203	75.0	202	75.1
510.parest_r	16	730	57.4	732	57.2	733	57.1	8	236	88.7	235	89.1	237	88.4
511.povray_r	16	312	120	311	120	311	120	16	281	133	281	133	281	133
519.lbm_r	16	327	51.6	327	51.6	327	51.6	16	327	51.6	327	51.6	327	51.6
521.wrf_r	16	454	78.9	457	78.5	456	78.6	8	202	88.9	199	89.9	199	90.0
526.blender_r	16	215	113	215	113	215	113	16	215	113	215	113	215	113
527.cam4_r	16	200	140	201	139	208	135	16	200	140	201	139	208	135
538.imagick_r	16	90.9	438	91.1	437	89.9	442	16	90.9	438	91.1	437	89.9	442
544.nab_r	16	155	174	155	174	155	174	16	155	174	155	174	155	174
549.fotonik3d_r	16	869	71.7	870	71.7	870	71.7	16	869	71.7	870	71.7	870	71.7
554.roms_r	16	579	43.9	575	44.2	573	44.3	8	267	47.7	267	47.6	267	47.7

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

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/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
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 Configuration:

Workload Profile set to General Throughput Compute
Thermal Configuration set to Maximum Cooling
Enhanced Processor Performance Profile set to Enabled
Workload Profile set to Custom
Minimum Processor Idle Power Package C-State set to Package C6 (non-retention) State

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Thu Feb 20 06:18:12 2025

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

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1. uname -a
2. w
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4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
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9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 252 (252-32.e19_4)
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
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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.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
06:18:12 up 8 min, 1 user, load average: 0.13, 0.05, 0.02
USER TTY LOGIN@ IDLE JCPU PCPU WHAT
root pts/0 06:16 1:56 0.00s 0.00s -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) 256639
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) 256639
virtual memory         (kbytes, -v) unlimited
file locks             (-x) unlimited

```

```

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 31
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@notty
bash -c cd $SPEC/ && $SPEC/fpratef.sh
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 -c
  ic2024.1-lin-core-avx2-rate-20240308.cfg --define smt-on --define cores=8 --define physicalfirst --define
  no-numa --tune base,peak -o all --define drop_caches fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 --configfile
  ic2024.1-lin-core-avx2-rate-20240308.cfg --define smt-on --define cores=8 --define physicalfirst --define
  no-numa --tune base,peak --output_format all --define drop_caches --nopower --runmode rate --tune
  base:peak --size refrate fprate --nopreenv --note-preenv --logfile
  $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

```

```

-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) 6357P
vendor_id      : GenuineIntel
cpu family     : 6
model          : 183
stepping      : 1
microcode     : 0x12c
bugs          : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
cpu cores     : 8
siblings      : 16
1 physical ids (chips)
16 processors (hardware threads)
physical id 0: core ids 0-7
physical id 0: apicids 0-15
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, 48 bits virtual
Byte Order:        Little Endian

```

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Platform Notes (Continued)

```

CPU(s): 16
On-line CPU(s) list: 0-15
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation
Model name: Intel(R) Xeon(R) 6357P
BIOS Model name: Intel(R) Xeon(R) 6357P
CPU family: 6
Model: 183
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 1
Stepping: 1
BogoMIPS: 5990.40
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
        xtology nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq
        dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm
        sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
        rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb ssbd ibrs ibpb stibp
        ibrs_enhanced tpr_shadow flexpriority ept vpid ept_ad fsgsbase
        tsc_adjust bmi1 avx2 smep bmi2 erms invpcid rdseed adx smap clflushopt
        clwb intel_pt sha_ni xsaveopt xsavec xgetbv1 xsaves split_lock_detect
        avx_vnni dtherm ida arat pln pts hfi vnmi umip pku ospke waitpkg gfni
        vaes vpclmulqdq tme rdpid movdiri movdir64b fsrm md_clear serialize
        pconfig arch_lbr ibt flush_lld arch_capabilities
Virtualization: VT-x
L1d cache: 384 KiB (8 instances)
L1i cache: 256 KiB (8 instances)
L2 cache: 16 MiB (8 instances)
L3 cache: 24 MiB (1 instance)
NUMA node(s): 1
NUMA node0 CPU(s): 0-15
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 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 384K 12 Data 1 64 1 64
L1i 32K 256K 8 Instruction 1 64 1 64
L2 2M 16M 16 Unified 2 2048 1 64
L3 24M 24M 12 Unified 3 32768 1 64

```

```

-----
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 1 nodes (0)
node 0 cpus: 0-15

```

(Continued on next page)



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Platform Notes (Continued)

```
node 0 size: 64201 MB
node 0 free: 63554 MB
node distances:
node 0
0: 10
```

```
-----
9. /proc/meminfo
MemTotal: 65742624 kB
```

```
-----
10. who -r
run-level 3 Feb 20 06:10
```

```
-----
11. Systemd service manager version: systemd 252 (252-32.el9_4)
Default Target Status
multi-user degraded
```

```
-----
12. Failed units, from systemctl list-units --state=failed
UNIT LOAD ACTIVE SUB DESCRIPTION
* NetworkManager-wait-online.service loaded failed failed Network Manager Wait Online
```

```
-----
13. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd crond
dbus-broker firewalld getty@ insights-client-boot irqbalance kdump lvm2-monitor mdmonitor
microcode nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd
systemd-boot-update systemd-network-generator udisks2
enabled-runtime systemd-remount-fs
disabled blk-availability console-getty cpupower debug-shell dnf-system-upgrade hwloc-dump-hwdata
kvm_stat man-db-restart-cache-update nftables rdisc rhcd rhsm rhsm-facts rpmdb-rebuild
selinux-check-proper-disable serial-getty@ sshd-keygen@ systemd-boot-check-no-failures
systemd-pstore systemd-sysext
indirect sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo systemd-sysupdate
systemd-sysupdate-reboot
```

```
-----
14. 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/rhel00-root
ro
resume=/dev/mapper/rhel00-swap
rd.lvm.lv=rhel00/root
rd.lvm.lv=rhel00/swap
```

```
-----
15. cpupower frequency-info
analyzing CPU 0:
Unable to determine current policy
boost state support:
Supported: yes
Active: yes
```

```
-----
16. sysctl
kernel.numa_balancing 0
kernel.randomize_va_space 2
```

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Platform Notes (Continued)

```

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+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_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/cpu2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel00-home xfs  829G  62G  767G   8% /home

```

```

-----
21. /sys/devices/virtual/dmi/id
Vendor:      HPE
Product:     ProLiant MicroServer Gen11
Product Family: ProLiant
Serial:      91ZV86L0HM

```

```

-----
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

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Platform Notes (Continued)

"DMTF SMBIOS" standard.

Memory:

2x Hynix HMC88AGBEA084N 32 GB 2 rank 5600, configured at 4400

23. BIOS

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

BIOS Vendor: HPE
BIOS Version: 2.10
BIOS Date: 12/06/2024
BIOS Revision: 2.10
Firmware Revision: 1.67

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 2024.1.0 Build 20240308
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=====
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 2024.1.0 Build 20240308
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=====
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 2024.1.0 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.

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

Intel(R) oneAPI DPC++/C++ 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
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
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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 2024.1.0 Build 20240308
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=====
Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
=====

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Compiler Version Notes (Continued)

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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

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

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



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Base Optimization Flags

C benchmarks:

```
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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
```

Benchmarks using both C and C++:

```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -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-AVX2 -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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

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(Test Sponsor: HPE)

ProLiant MicroServer Gen11
(3.00 GHz, Intel Xeon 6357P)

SPECrate®2017_fp_base = 113

SPECrate®2017_fp_peak = 120

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Feb-2025
Hardware Availability: Mar-2025
Software Availability: Apr-2024

Peak 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

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 -xCORE-AVX2 -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-AVX2 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops

(Continued on next page)



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Peak Optimization Flags (Continued)

554.roms_r (continued):

```
-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-AVX2 -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++:

```
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 -flto  
-Ofast -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-AVX2 -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/HPE-Platform-Flags-Intel-CatlowRefresh-rev1.0.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/HPE-Platform-Flags-Intel-CatlowRefresh-rev1.0.xml>

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



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