### SPEC CPU®2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
*Test Sponsor: HPE*  
ProLiant DL380 Gen11  
*(2.40 GHz, Intel Xeon Platinum 8468V)*

**SPECspeed®2017_fp_base = 327**  
**SPECspeed®2017_fp_peak = 327**

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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Feb-2023  
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<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (327)</th>
<th>SPECspeed®2017_fp_peak (327)</th>
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<tr>
<td>603.bwaves_s 96</td>
<td>387</td>
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</tr>
<tr>
<td>607.cactuBSSN_s 96</td>
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<td>619.ibm_s 96</td>
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<td>621.wrf_s 96</td>
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<td>627.cam4_s 96</td>
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<td>699</td>
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<tr>
<td>628.pop2_s 96</td>
<td>478</td>
<td>699</td>
</tr>
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### Hardware

- **CPU Name:** Intel Xeon Platinum 8468V  
- **Max MHz:** 3800  
- **Nominal:** 2400  
- **Enabled:** 96 cores, 2 chips  
- **Orderable:** 1, 2 chip(s)  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **Cache L2:** 2 MB I+D on chip per core  
- **Cache L3:** 97.5 MB I+D on chip per chip  
- **Memory:** 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)  
- **Storage:** 1 x 400 GB SATA SSD  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux release 9.0 (Plow)  
- **Kernel:** 5.14.0-70.13.1.el9_0.x86_64
- **Compiler:** C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2022.1 of Intel Fortran Compiler for Linux
- **Parallel:** Yes  
- **Firmware:** HPE BIOS Version v1.22 01/18/2023 released Jan-2023  
- **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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<td>43.1</td>
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<td>473</td>
<td>32.9</td>
<td>479</td>
<td>33.0</td>
<td>478</td>
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</table>

**Results Table**

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

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### 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"  
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>

---

### Environment Variables Notes

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

- `KMP_AFFINITY = "granularity=fine,compact"`
- `LD_LIBRARY_PATH = "/home/cpu2017_19/lib/intel64:/home/cpu2017_19/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 Red Hat Enterprise Linux 8.4

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Feb-2023
Hardware Availability: Jan-2023
Software Availability: May-2022

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.

Platform Notes

The system ROM used for this result contains Intel microcode version 0x2b000161 for the Intel Xeon Platinum 8468V processor.
BIOS Configuration:
Workload Profile set to General Peak Frequency Compute
Thermal Configuration set to Maximum Cooling
Intel Hyper-Threading set to Disabled
Memory Patrol Scrubbing set to Disabled
Last Level Cache (LLC) Prefetch set to Enabled
Last Level Cache (LLC) Dead Line Allocation set to Disabled
Enhanced Processor Performance Profile set to Aggressive
Dead Block Predictor set to Enabled
Workload Profile set to Custom
Intel DMI Link Frequency set to Gen2 Speed
Adjacent Sector Prefetch set to Disabled
Minimum Processor Idle Power Package C-State set to No Package State

Sysinfo program /home/cpu2017_19/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Thu Feb 9 23:30:00 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
7. lscpu
8. numactl --hardware
9. /proc/meminfo

(Continued on next page)
Platform Notes (Continued)

10. who -r
11. Systemd service manager version: systemd 250 (250-6.el9_0)
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/klhugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
dmidecode
22. BIOS

------------------------------------------------------------
1. uname -a
   Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14 12:42:38 EDT 2022 x86_64
   x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   23:30:00 up 0 min, 0 users, load average: 0.24, 0.08, 0.03
   USER TTY LOGIN@ IDLE JCPU PCPU WHAT

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

------------------------------------------------------------
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) 4127189
   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) 4127189

(Continued on next page)
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**Platform Notes (Continued)**

5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 28  
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups  
sshd: root [priv]  
sshd: root@notty  
bash -c cd $SPEC/ && $SPEC/fpspeed.sh  
runcpu --nobuild --action validate --define default-platform-flags -c  
   ic2022.1-lin-core-avx512-speed-20220316.cfg --define cores=96 --tune base,peak -o all --define drop_caches fpspeed  
runcpu --nobuild --action validate --define default-platform-flags --configfile  
   ic2022.1-lin-core-avx512-speed-20220316.cfg --define cores=96 --tune base,peak --output_format all  
   --define drop_caches --nopower --runmode speed --tune base:peak --size refspeed fpspeed --nopreenv  
   --note-preenv --logfile $SPEC/tmp/CPUCPU2017.001/temlogs/preenv.fpspeed.001.0.log --lognum 001.0  
   --from_runcpu 2  
specperl $SPEC/bin/sysinfo  
$SPEC = /home/cpu2017_19

---

6. /proc/cpuinfo
   model name : Intel(R) Xeon(R) Platinum 8468V  
   vendor_id : GenuineIntel  
   cpu family : 6  
   model : 143  
   stepping : 6  
   microcode : 0x2b000161  
   bugs : spectre_v1 spectre_v2 spec_store_bypass swapgs  
   cpu cores : 48  
   siblings : 48  
   2 physical ids (chips)  
   96 processors (hardware threads)  
   physical id 0: core ids 0-47  
   physical id 1: core ids 0-47  
   physical id 0: apicids  
   0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70,72  
   ,74,76,78,80,82,84,86,88,90,92,94  
   physical id 1: apicids  
   80,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212,214,216,218,220,222

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

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7. lscpu

(Continued on next page)
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ProLiant DL380 Gen11
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Hardware Availability: Jan-2023
Software Availability: May-2022

Platform Notes (Continued)

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): 96
On-line CPU(s) list: 0-95
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation
Model name: Intel(R) Xeon(R) Platinum 8468V
BIOS Model name: Intel(R) Xeon(R) Platinum 8468V
CPU family: 6
Model: 143
Thread(s) per core: 1
Core(s) per socket: 48
Socket(s): 2
Stepping: 6
BogoMIPS: 4800.00

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 pkid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abtm 3nowprefetch cpuid_fault ebpx_cat_13 cat_12 cdq _l3 invpcid_single cdq _l2 ssbd mba ibrs ibpb ibrs_enhanced tpr_shadow vnmi fexcompletion ept vpid eqad tpxgbase tpx_adjust bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma ciefushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaveev xgetbv1 xsaveas cqm_llc cqm_occup llc cqm_mmb_total cqm_mmb_local split_lock_detect avx_vnni avx512_bf16 wboinvd dtherm lda arat plt avx512vmbi umip kpu ospke waitpkg avx512_vmbi gfn vaes vpcmulqdq avx512_vnni avx512_bitalg tme avx512_vpontc d la57 rdpid bus_lock_detect cldemote movdri movdir64b enqcmd form md_clear serialize txslidtrk pconfig arch_lbr avx512_fp16 amx_tile flush_l1d arch_capabilities

Virtualization: VT-x
L1d cache: 4.5 MiB (96 instances)
L1i cache: 3.0 MiB (96 instances)
L2 cache: 192 MiB (96 instances)
L3 cache: 195 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-23, 48-71
NUMA node1 CPU(s): 24-47, 72-95
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected

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**Platform Notes (Continued)**

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, IBFB conditional, RSB filling  
Vulnerability Srbd: 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   4.5M  12 Data  1  64     1  64
L1i   32K   3M   8 Instruction 1  64     1  64
L2    2M   192M 16 Unified 2 2048   1  64
L3   97.5M 195M 15 Unified 3 106496 1  64
```

8. numactl --hardware

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

```
available: 2 nodes (0-1)
node 0 cpus: 0-23,48-71
node 0 size: 515762 MB
node 0 free: 514392 MB
node 1 cpus: 24-47,72-95
node 1 size: 516074 MB
node 1 free: 514664 MB
node distances:
node   0   1
0:    10  20
1:    20  10
```

9. /proc/meminfo

```
MemTotal:       1056601008 kB
```

10. who -r

```
run-level 3 Feb 9 23:29
```

11. Systemd service manager version: systemd 250 (250-6.e19_0)

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

12. Services, from systemctl list-unit-files

```
STATE UNIT FILES
enabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chrony crond
  dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode

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Platform Notes (Continued)

nis-domainname rshmcertd rsyslog selinux-autorelabel-mark sshd sssd
systemd-network-generator tuned udisk2 upower
enabled-runtime systemctl-remount-fs
disabled blk-availability canberra-system-bootup canberra-system-shutdown
canberra-system-shutdown-reboot console-getty cpupower debug-shell
hwloc-dump-hwdata ipsec kvm_stat man-db-restart-cache-update nftables powertop rdisc rhsm
rhm-facts rpmdb-rebuild serial-getty@ ssdh-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

--------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline

BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
root=/dev/mapper/rhel-root
ro
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root
rd.lvm.lv=rhel/swap

--------------------------------------------
14. cpupower frequency-info

analyzing CPU 0:
Unable to determine current policy
boost state support:
  Supported: yes
  Active: yes

--------------------------------------------
15. tuned-adm active

Current active profile: accelerator-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

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Platform Notes (Continued)

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_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 9.0 (Plow)
   redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
   system-release Red Hat Enterprise Linux release 9.0 (Plow)

20. Disk information
   SPEC is set to: /home/cpu2017_19
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs 372G 361G 11G 98% /home

21. /sys/devices/virtual/dmi/id
   Vendor: HPE
   Product: ProLiant DL380 Gen11
   Product Family: ProLiant
   Serial: CNX21000G8

22. dmidecode
   Additional information from dmidecode 3.3 follows. WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.40 GHz, Intel Xeon Platinum 8468V)

SPECspeed®2017_fp_base = 327
SPECspeed®2017_fp_peak = 327

Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
"DMTF SMBIOS" standard.
Memory:
16x Hynix HMCG94AEBRA103N 64 GB 2 rank 4800

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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
2022.1.0 Build 20220316
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---------
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
2022.1.0 Build 20220316

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
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SPECspeed®2017_fp_base = 327
SPECspeed®2017_fp_peak = 327

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<td>HPE</td>
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<tr>
<td>Tested by:</td>
<td>HPE</td>
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Test Date:            Feb-2023
Hardware Availability: Jan-2023
Software Availability: May-2022

Compiler Version Notes (Continued)

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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 2022.1.0 Build 20220316
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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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:
- -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
- -DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
- -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -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:
- -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
- -DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte -auto
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
- -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
- -DSPEC_OPENMP -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
# SPEC CPU®2017 Floating Point Speed Result

### Test Sponsor: HPE

**ProLiant DL380 Gen11**  
(2.40 GHz, Intel Xeon Platinum 8468V)

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

### Test Date: Feb-2023  
Hardware Availability: Jan-2023  
Software Availability: May-2022

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## Peak Optimization Flags

### C benchmarks:

- 619.lbm_s: basepeak = yes
- 638.imagick_s: basepeak = yes
- 644.nab_s: basepeak = yes

### Fortran benchmarks:

- 649.fotonik3d_s: basepeak = yes
- 654.roms_s: basepeak = yes

### Benchmarks using both Fortran and C:

- 621.wrf_s: basepeak = yes
- 627.cam4_s: basepeak = yes
- 628.pop2_s: basepeak = yes

### Benchmarks using Fortran, C, and C++:

- 607.cactusBSSN_s: basepeak = yes

---

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

- [http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.1.html](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.1.html)

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

- [http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.1.xml](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.1.xml)
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**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen11  
(2.40 GHz, Intel Xeon Platinum 8468V)  

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### CPU2017 License: 3  
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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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