# SPEC CPU®2017 Floating Point Speed Result

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL380a Gen11
(2.00 GHz, Intel Xeon Platinum 8480+)

$SPECspeed®2017\_fp\_base = 341$

$SPECspeed®2017\_fp\_peak = 341$

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

**Test Date:** Feb-2023
**Hardware Availability:** Jan-2023
**Software Availability:** Feb-2023

**Threads**

| Benchmark | Threads | Result |
|-----------|---------|--------|
| 603.bwaves_s | 112 | 1030 |
| 607.cactuBSSN_s | 112 | 419 |
| 619.lbm_s | 112 | 250 |
| 621.wrf_s | 112 | 205 |
| 627.cam4_s | 112 | 209 |
| 628.pop2_s | 112 | 91.7 |
| 638.imagick_s | 112 | 698 |
| 644.nab_s | 112 | 795 |
| 649.fotonik3d_s | 112 | 167 |
| 654.roms_s | 112 | 542 |

SPECspeed®2017_fp_base (341)          SPECspeed®2017_fp_peak (341)

## Hardware

CPU Name: Intel Xeon Platinum 8480+
 Max MHz: 3800
 Nominal: 2000
Enabled: 112 cores, 2 chips
Orderable: 1, 2 chip(s)
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 105 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 2.9 TB NVMe SSD
Other: None

## Software

OS: Ubuntu 22.04.2 LTS
 Kernel 5.15.0-60-generic
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: ext4
System State: Run level 5 (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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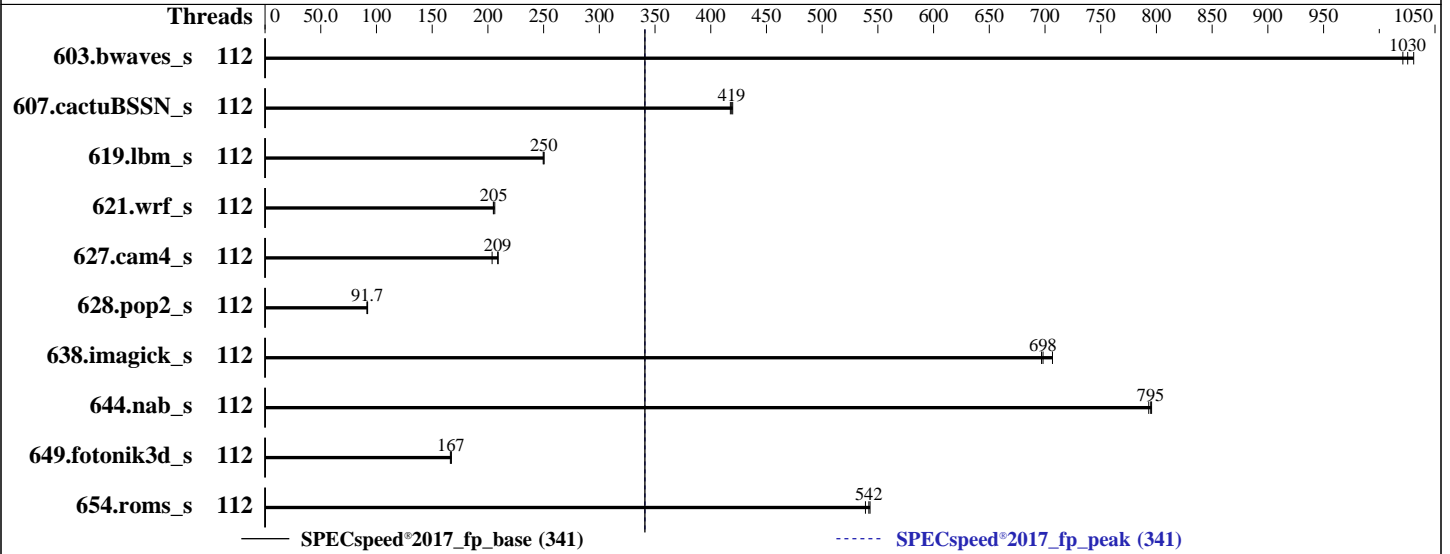**Hewlett Packard Enterprise**

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| | | |
|---|---|---|
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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 | 112 | 57.2 | 1030 | 57.8 | 1020 | **57.5** | **1030** | 112 | 57.2 | 1030 | 57.8 | 1020 | **57.5** | **1030** |
| 607.cactuBSSN_s | 112 | 39.9 | 418 | **39.8** | **419** | 39.7 | 420 | 112 | 39.9 | 418 | **39.8** | **419** | 39.7 | 420 |
| 619.lbm_s | 112 | 21.0 | 250 | **20.9** | **250** | 20.9 | 250 | 112 | 21.0 | 250 | **20.9** | **250** | 20.9 | 250 |
| 621.wrf_s | 112 | 64.1 | 206 | **64.4** | **205** | 64.6 | 205 | 112 | 64.1 | 206 | **64.4** | **205** | 64.6 | 205 |
| 627.cam4_s | 112 | 42.4 | 209 | **42.5** | **209** | 43.5 | 204 | 112 | 42.4 | 209 | **42.5** | **209** | 43.5 | 204 |
| 628.pop2_s | 112 | **129** | **91.7** | 130 | 91.5 | 129 | 92.1 | 112 | **129** | **91.7** | 130 | 91.5 | 129 | 92.1 |
| 638.imagick_s | 112 | 20.4 | 707 | **20.7** | **698** | 20.7 | 697 | 112 | 20.4 | 707 | **20.7** | **698** | 20.7 | 697 |
| 644.nab_s | 112 | **22.0** | **795** | 22.0 | 793 | 22.0 | 796 | 112 | **22.0** | **795** | 22.0 | 793 | 22.0 | 796 |
| 649.fotonik3d_s | 112 | 54.8 | 166 | **54.6** | **167** | 54.5 | 167 | 112 | 54.8 | 166 | **54.6** | **167** | 54.5 | 167 |
| 654.roms_s | 112 | **29.1** | **542** | 29.0 | 543 | 29.2 | 539 | 112 | **29.1** | **542** | 29.0 | 543 | 29.2 | 539 |
| **SPECspeed®2017_fp_base =** | **341** | | | | | | | | | | | | | |
| **SPECspeed®2017_fp_peak =** | **341** | | | | | | | | | | | | | |

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"
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
IRQ balance service was stopped using "systemctl stop irqbalance.service"
tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"
```

## Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/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
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
```

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## General Notes (Continued)

```
 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

```
The system ROM used for this result contains Intel microcode version 0x2b000161 for
the Intel Xeon Platinum 8480+ 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/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on admin1 Sun Feb 26 14:52:06 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
 10. who -r
 11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.6)
 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. tuned-adm active
 16. sysctl
```

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Standard Performance Evaluation Corporation (info@spec.org)                 https://www.spec.org/

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## Platform Notes (Continued)

```
17. /sys/kernel/mm/transparent_hugepage
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 admin1 5.15.0-60-generic #66-Ubuntu SMP Fri Jan 20 14:29:49 UTC 2023 x86_64 x86_64 x86_64 GNU/Linux


-----------------------------------------------------------
2. w
   14:52:06 up 5 min,  2 users,  load average: 1.00, 0.87, 0.44
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   admin1   tty1     -                14:49    2:30   0.07s  0.01s -bash
   admin1   pts/0    -                14:49    6.00s  0.79s  0.02s sudo -i

-----------------------------------------------------------
3. Username
   From environment variable $USER:  root
   From the command 'logname':       admin1


-----------------------------------------------------------
4. ulimit -a
   time(seconds)        unlimited
   file(blocks)         unlimited
   data(kbytes)         unlimited
   stack(kbytes)        unlimited
   coredump(blocks)     0
   memory(kbytes)       unlimited
   locked memory(kbytes) 132074772
   process              4126892
   nofiles              1024
   vmemory(kbytes)      unlimited
   locks                unlimited
   rtprio               0


-----------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init
 /bin/login -p --
 -bash
 sudo -i
 sudo -i
```

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## Platform Notes (Continued)

```
 -bash
 -bash
 runcpu --nobuild --action validate --define default-platform-flags -c
   ic2022.1-lin-core-avx512-speed-20220316.cfg --define cores=112 --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=112 --tune base,peak --output_format all
   --define drop_caches --nopower --runmode speed --tune base:peak --size refspeed fpspeed --nopreenv
   --note-preenv --logfile $SPEC/tmp/CPU2017.015/templogs/preenv.fpspeed.015.0.log --lognum 015.0
   --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017


 ------------------------------------------------------------
 6. /proc/cpuinfo
    model name        : Intel(R) Xeon(R) Platinum 8480+
    vendor_id         : GenuineIntel
    cpu family        : 6
    model             : 143
    stepping          : 6
    microcode         : 0x2b000161
    bugs              : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores         : 56
    siblings          : 56
    2 physical ids (chips)
    112 processors (hardware threads)
    physical id 0: core ids 0-55
    physical id 1: core ids 0-55
    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
    ,74,76,78,80,82,84,86,88,90,92,94,96,98,100,102,104,106,108,110
    physical id 1: apicids
  128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174,176,178,1
    80,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212,214,216,218,220,222,224,226,228,230,23
    2,234,236,238
  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 2.37.2:
   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):                   112
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
  On-line CPU(s) list:             0-111
  Vendor ID:                       GenuineIntel
  Model name:                      Intel(R) Xeon(R) Platinum 8480+
  CPU family:                      6
  Model:                           143
  Thread(s) per core:              1
  Core(s) per socket:              56
  Socket(s):                       2
  Stepping:                        6
  BogoMIPS:                        4000.00
  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 cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
                                    vnmi 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 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
                                    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 amx_bf16 avx512_fp16 amx_tile amx_int8 flush_l1d
                                       arch_capabilities
  Virtualization:                  VT-x
  L1d cache:                       5.3 MiB (112 instances)
  L1i cache:                       3.5 MiB (112 instances)
  L2 cache:                        224 MiB (112 instances)
  L3 cache:                        210 MiB (2 instances)
  NUMA node(s):                    2
  NUMA node0 CPU(s):               0-27,56-83
  NUMA node1 CPU(s):               28-55,84-111
  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, PBRSB-eIBRS SW
                                   sequence
  Vulnerability Srbds:             Not affected
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
    Vulnerability Tsx async abort:   Not affected

 From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL    SETS PHY-LINE COHERENCY-SIZE
     L1d        48K     5.3M   12 Data            1      64        1             64
     L1i        32K     3.5M    8 Instruction     1      64        1             64
     L2          2M     224M   16 Unified         2    2048        1             64
     L3        105M     210M   15 Unified         3  114688        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: 0-27,56-83
   node 0 size: 515793 MB
   node 0 free: 514210 MB
   node 1 cpus: 28-55,84-111
   node 1 size: 516040 MB
   node 1 free: 514632 MB
   node distances:
   node   0   1
     0:  10  20
     1:  20  10


   ----------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:       1056598180 kB


   ----------------------------------------------------------------
 10. who -r
   run-level 5 Feb 26 14:48


   ----------------------------------------------------------------
 11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.6)
   Default Target  Status
   graphical       degraded


   ----------------------------------------------------------------
 12. Failed units, from systemctl list-units --state=failed
     UNIT                                LOAD   ACTIVE SUB    DESCRIPTION
   * ipmiutil_wdt.service               loaded failed failed ipmiutil Watchdog Timer Service using cron
   * systemd-networkd-wait-online.service loaded failed failed Wait for Network to be Configured


   ----------------------------------------------------------------
 13. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         ModemManager anacron apparmor blk-availability cloud-config cloud-final cloud-init
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
                   cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager
                   grub-common grub-initrd-fallback ipmiutil_wdt irqbalance keyboard-setup lvm2-monitor
                   lxd-agent multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rpcbind
                   rsyslog secureboot-db setvtrgb snapd ssh systemd-networkd systemd-networkd-wait-online
                    systemd-pstore systemd-resolved systemd-timesyncd thermald tuned ua-reboot-cmds
                       ubuntu-advantage udisks2 ufw unattended-upgrades vgauth
  enabled-runtime   netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
  disabled          console-getty debug-shell ipmi_port ipmievd ipmiutil_asy ipmiutil_evt iscsid nftables
                    powertop rsync serial-getty@ systemd-boot-check-no-failures systemd-network-generator
                       systemd-sysext systemd-time-wait-sync upower
  generated         apport openipmi
  indirect          uuidd
  masked            cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
                       x11-common


  ----------------------------------------------------------------
  14. Linux kernel boot-time arguments, from /proc/cmdline
     BOOT_IMAGE=/vmlinuz-5.15.0-60-generic
     root=/dev/mapper/ubuntu--vg-ubuntu--lv
     ro


  ----------------------------------------------------------------
  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
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
     ----------------------------------------------------------------
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 Ubuntu 22.04.2 LTS


     ----------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
  Filesystem                        Type  Size  Used Avail Use% Mounted on
  /dev/mapper/ubuntu--vg-ubuntu--lv ext4  2.9T  169G  2.6T   7% /


     ----------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         HPE
    Product:        ProLiant DL380a Gen11
    Product Family: ProLiant
    Serial:         CNX22602NL


     ----------------------------------------------------------------
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
  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-CQKDG 64 GB 2 rank 4800
    8x UNKNOWN NOT AVAILABLE


     ----------------------------------------------------------------
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
   23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       HPE
    BIOS Version:      1.22
    BIOS Date:         01/18/2023
    BIOS Revision:     1.22
    Firmware Revision: 1.20
```

## 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
Copyright (C) 1985-2022 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
  2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


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

**(Continued on next page)**

# SPEC CPU®2017 Floating Point Speed Result

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## Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL380a Gen11
(2.00 GHz, Intel Xeon Platinum 8480+)

SPECspeed®2017_fp_base = 341

SPECspeed®2017_fp_peak = 341

## Compiler Version Notes (Continued)

```
Intel(R) Fortran 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.
------------------------------------------------------------------------
```

## 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`

**(Continued on next page)**

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL380a Gen11
(2.00 GHz, Intel Xeon Platinum 8480+)

$SPECspeed^{®}2017\_fp\_base = 341$

$SPECspeed^{®}2017\_fp\_peak = 341$

| | |
|---|---|
| **CPU2017 License:** 3 | **Test Date:** Feb-2023 |
| **Test Sponsor:** HPE | **Hardware Availability:** Jan-2023 |
| **Tested by:** HPE | **Software Availability:** Feb-2023 |

# Base Optimization Flags (Continued)

C benchmarks (continued):
```
-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
```

| | |
|---|---|
| **Hewlett Packard Enterprise** | SPECspeed®2017_fp_base = 341 |
| (Test Sponsor: HPE) | |
| **ProLiant DL380a Gen11** | SPECspeed®2017_fp_peak = 341 |
| (2.00 GHz, Intel Xeon Platinum 8480+) | |

| | | | |
|---|---|---|---|
| **CPU2017 License:** 3 | | **Test Date:** | Feb-2023 |
| **Test Sponsor:** | HPE | **Hardware Availability:** | Jan-2023 |
| **Tested by:** | HPE | **Software Availability:** | Feb-2023 |

# Peak Optimization Flags

C benchmarks:

  619.lbm_s: `basepeak = yes`

  638.imagick_s: `basepeak = yes`

  644.nab_s: `basepeak = yes`

Fortran benchmarks:

  603.bwaves_s: `basepeak = yes`

  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.cactuBSSN_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/Intel-ic2022-official-linux64_revA.html`

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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/Intel-ic2022-official-linux64_revA.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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