SPEC CPU®2017 Floating Point Speed Result

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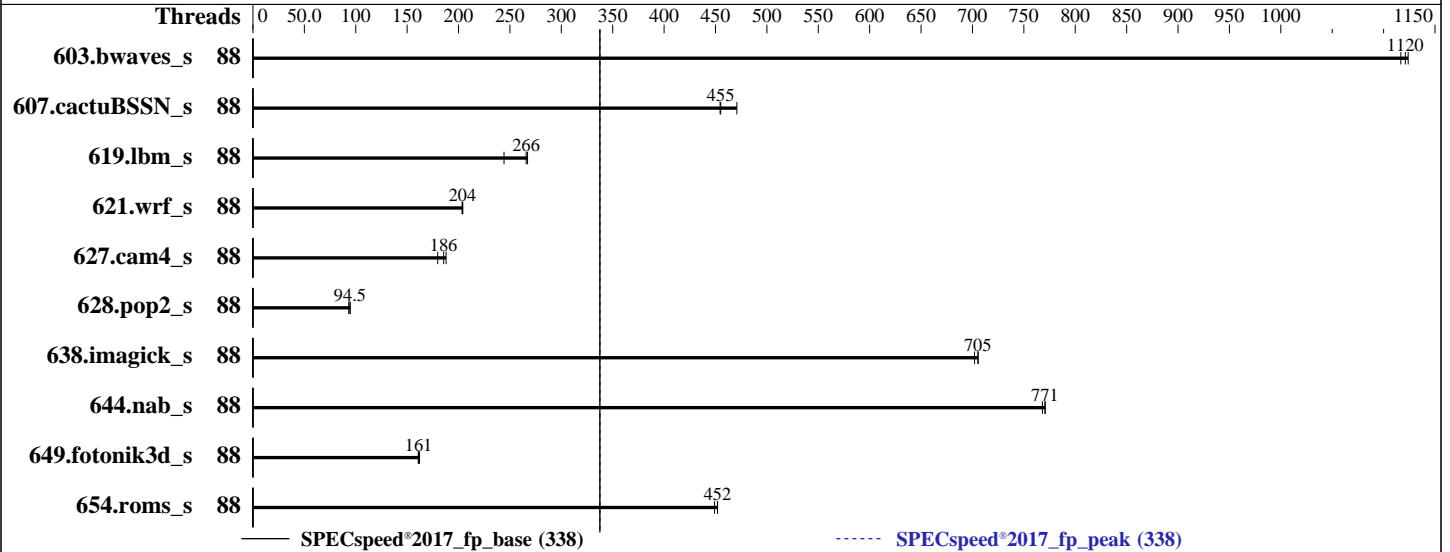## Nettrix

$SPECspeed^{®}2017\_fp\_base = 338$

R620 G50 (Intel Xeon Platinum 8458P, 2.70 GHz)

$SPECspeed^{®}2017\_fp\_peak = 338$

CPU2017 License: 6138
Test Sponsor: Nettrix
Tested by: Nettrix

Test Date: Mar-2023
Hardware Availability: Jan-2023
Software Availability: Dec-2022

Threads — scale 0 to 1150

- **603.bwaves_s** 88 — 1120
- **607.cactuBSSN_s** 88 — 455
- **619.lbm_s** 88 — 266
- **621.wrf_s** 88 — 204
- **627.cam4_s** 88 — 186
- **628.pop2_s** 88 — 94.5
- **638.imagick_s** 88 — 705
- **644.nab_s** 88 — 771
- **649.fotonik3d_s** 88 — 161
- **654.roms_s** 88 — 452

SPECspeed®2017_fp_base (338)   SPECspeed®2017_fp_peak (338)

Hardware

CPU Name: Intel Xeon Platinum 8458P
  Max MHz: 3800
  Nominal: 2700
Enabled: 88 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
  L2: 2 MB I+D on chip per core
  L3: 82.5 MB I+D on chip per chip
  Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 960 GB NVME SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4
  5.14.21-150400.22-default
Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
  Fortran: Version 2023.0 of Intel Fortran Compiler Classic for Linux;
  C/C++: Version 2023.0 of Intel C/C++ Compiler Classic for Linux
Parallel: Yes
Firmware: Nettrix BIOS Version NNH1041018-U00-1 released Nov-2022
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	88	**52.6**	**1120**	52.8	1120	52.5	1120	88	**52.6**	**1120**	52.8	1120	52.5	1120
607.cactuBSSN_s	88	36.7	454	35.4	471	**36.6**	**455**	88	36.7	454	35.4	471	**36.6**	**455**
619.lbm_s	88	21.4	244	19.6	267	**19.7**	**266**	88	21.4	244	19.6	267	**19.7**	**266**
621.wrf_s	88	**64.9**	**204**	65.0	203	64.8	204	88	**64.9**	**204**	65.0	203	64.8	204
627.cam4_s	88	47.2	188	49.3	180	**47.8**	**186**	88	47.2	188	49.3	180	**47.8**	**186**
628.pop2_s	88	**126**	**94.5**	126	94.5	127	93.1	88	**126**	**94.5**	126	94.5	127	93.1
638.imagick_s	88	20.5	702	20.4	706	**20.5**	**705**	88	20.5	702	20.4	706	**20.5**	**705**
644.nab_s	88	22.7	768	**22.7**	**771**	22.7	771	88	22.7	768	**22.7**	**771**	22.7	771
649.fotonik3d_s	88	56.2	162	56.7	161	**56.5**	**161**	88	56.2	162	56.7	161	**56.5**	**161**
654.roms_s	88	35.1	449	**34.8**	**452**	34.8	452	88	35.1	449	**34.8**	**452**	34.8	452
SPECspeed®2017_fp_base =		**338**												
SPECspeed®2017_fp_peak =		**338**												

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

Operating System Notes

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

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/lijq/lib/intel64:/home/lijq/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.
  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
  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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R620 G50 (Intel Xeon Platinum 8458P, 2.70 GHz)

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Platform Notes

```
BIOS Configuration:
  Enable LP [Global] set to Single LP
  LLC Prefetch set to Enabled
  SNC (Sub NUMA) set to Disabled
  Patrol Scrub set to Disabled
  LLC dead line alloc set to Disabled
  XPT Prefetch set to Enabled
  KTI Prefetch set to Disabled
  DCU Streamer Prefetcher set to Disabled
  Hardware P-States set to Native Mode

Sysinfo program /home/lijq/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Mar 14 08:02:15 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+suse.124.g2bc0b2c447)
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/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS
-----------------------------------------------------------


-----------------------------------------------------------
 1. uname -a
```

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Nettrix

SPECspeed®2017_fp_base = 338

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Platform Notes (Continued)

```
  Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
  x86_64 x86_64 x86_64 GNU/Linux


  -------------------------------------------------------------
2. w
   08:02:15 up 14 min,  1 user,  load average: 2.08, 30.91, 26.01
  USER      TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root      tty1     -                07:48   39.00s  0.98s  0.00s -bash


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


  -------------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) unlimited
  data seg size           (kbytes, -d) unlimited
  scheduling priority             (-e) 0
  file size               (blocks, -f) unlimited
  pending signals                 (-i) 4125217
  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) 4125217
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited


  -------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 29
 login -- root
 -bash
 -bash
 runcpu --nobuild --reportable --iterations 3 --define default-platform-flags -c
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=88 --tune base,peak -o all --define
   drop_caches fpspeed
 runcpu --nobuild --reportable --iterations 3 --define default-platform-flags --configfile
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=88 --tune base,peak --output_format all
   --define drop_caches --nopower --runmode speed --tune base:peak --size refspeed fpspeed --nopreenv
   --note-preenv --logfile $SPEC/tmp/CPU2017.064/templogs/preenv.fpspeed.064.0.log --lognum 064.0
   --from_runcpu 2
 specperl $SPEC/bin/sysinfo
```

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Platform Notes (Continued)

```
$SPEC = /home/lijq


-------------------------------------------------------------
6. /proc/cpuinfo
    model name         : Intel(R) Xeon(R) Platinum 8458P
    vendor_id          : GenuineIntel
    cpu family         : 6
    model              : 143
    stepping           : 8
    microcode          : 0x2b000111
    bugs               : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores          : 44
    siblings           : 44
    2 physical ids (chips)
    88 processors (hardware threads)
    physical id 0: core ids 0-43
    physical id 1: core ids 0-43
    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
    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
  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:             52 bits physical, 57 bits virtual
  Byte Order:                Little Endian
  CPU(s):                    88
  On-line CPU(s) list:       0-87
  Vendor ID:                 GenuineIntel
  Model name:                Intel(R) Xeon(R) Platinum 8458P
  CPU family:                6
  Model:                     143
  Thread(s) per core:        1
  Core(s) per socket:        44
  Socket(s):                 2
  Stepping:                  8
  CPU max MHz:               3800.0000
  CPU min MHz:               800.0000
  BogoMIPS:                  5400.00
```

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Platform Notes (Continued)

```
  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 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
                              intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
                              flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
                              erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
                              clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec
                                 xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                              split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts
                              hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku ospke waitpkg
                                 avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme
                              avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri movdir64b
                              enqcmd fsrm md_clear serialize tsxldtrk pconfig arch_lbr avx512_fp16
                                      amx_tile flush_l1d arch_capabilities
  Virtualization:                 VT-x
  L1d cache:                      4.1 MiB (88 instances)
  L1i cache:                      2.8 MiB (88 instances)
  L2 cache:                       176 MiB (88 instances)
  L3 cache:                       165 MiB (2 instances)
  NUMA node(s):                   2
  NUMA node0 CPU(s):              0-43
  NUMA node1 CPU(s):              44-87
  Vulnerability Itlb multihit:    Not affected
  Vulnerability L1tf:             Not affected
  Vulnerability Mds:              Not affected
  Vulnerability Meltdown:         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
  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     4.1M  12 Data            1     64       1              64
     L1i       32K     2.8M   8 Instruction     1     64       1              64
     L2         2M     176M  16 Unified         2   2048       1              64
     L3      82.5M     165M  15 Unified         3  90112       1              64

  -----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 2 nodes (0-1)
```

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Platform Notes (Continued)

```
  node 0 cpus: 0-43
  node 0 size: 515570 MB
  node 0 free: 511254 MB
  node 1 cpus: 44-87
  node 1 size: 515755 MB
  node 1 free: 514152 MB
  node distances:
  node   0   1
    0:  10  21
    1:  21  10


  ----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1056078196 kB


  ----------------------------------------------------------
10. who -r
   run-level 3 Mar 14 07:47


  ----------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
   Default Target  Status
   multi-user      running


  ----------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE           UNIT FILES
  enabled          apparmor auditd cron getty@ haveged irqbalance issue-generator kbdsettings kdump
                   kdump-early nvmefc-boot-connections postfix purge-kernels rollback sshd wicked
                     wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
  enabled-runtime  systemd-remount-fs
  disabled          boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell
                   exchange-bmc-os-info grub2-once haveged-switch-root ipmievd issue-add-ssh-keys kexec-load
                     nfs nfs-blkmap nvmf-autoconnect rpcbind rpmconfigcheck serial-getty@
                     systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                     systemd-time-wait-sync systemd-timesyncd tuned
  indirect         wickedd


  ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=9e7d079b-be10-4779-89e1-79f870e2ca09
   splash=silent
   mitigations=auto
   quiet
   security=apparmor
   crashkernel=300M,high
```

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Platform Notes (Continued)

```
    crashkernel=72M,low


    ---------------------------------------------------------------
 14. cpupower frequency-info
   analyzing CPU 0:
      current policy: frequency should be within 800 MHz and 3.80 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                    20
   vm.dirty_writeback_centisecs     500
   vm.dirtytime_expire_seconds    43200
   vm.extfrag_threshold             500
   vm.min_unmapped_ratio              1
   vm.nr_hugepages                    0
   vm.nr_hugepages_mempolicy          0
   vm.nr_overcommit_hugepages         0
   vm.swappiness                     10
   vm.watermark_boost_factor      15000
   vm.watermark_scale_factor         10
   vm.zone_reclaim_mode               0

    ---------------------------------------------------------------
 17. /sys/kernel/mm/transparent_hugepage
   defrag          always defer defer+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
```

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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 SUSE Linux Enterprise Server 15 SP4


   ----------------------------------------------------------
20. Disk information
SPEC is set to: /home/lijq
   Filesystem     Type   Size  Used Avail Use% Mounted on
   /dev/nvme0n1p3 btrfs  854G  323G  531G  38% /home


   ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
      Vendor:        Nettrix
      Product:       R620 G50
      Product Family: Rack
      Serial:        6101810603447822


   ----------------------------------------------------------
22. dmidecode
   Additional information from dmidecode 3.2 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-CQKVG 64 GB 2 rank 4800



   ----------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:      American Megatrends International, LLC.
   BIOS Version:     NNH1041018-U00-1
   BIOS Date:        11/01/2022
   BIOS Revision:    5.29
```

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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 2023.0.0 Build 20221201
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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2023.0.0 Build 20221201
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
  2023.0.0 Build 20221201
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)
--------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------
```

SPEC CPU®2017 Floating Point Speed Result

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Nettrix

R620 G50 (Intel Xeon Platinum 8458P, 2.70 GHz)

SPECspeed®2017_fp_base = 338

SPECspeed®2017_fp_peak = 338

CPU2017 License: 6138
Test Sponsor: Nettrix
Tested by: Nettrix

Test Date: Mar-2023
Hardware Availability: Jan-2023
Software Availability: Dec-2022

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 -xsapphirerapids -Ofast -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp`
`-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

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

Benchmarks using both Fortran and C:
`-m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math`

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

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
```
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:
```
-m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -Wno-implicit-int
-mprefer-vector-width=512 -nostandard-realloc-lhs -align array32byte
-auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Peak Compiler Invocation

C benchmarks:
```
icx
```

Fortran benchmarks:
```
ifx
```

Benchmarks using both Fortran and C:
```
ifx icx
```

Benchmarks using Fortran, C, and C++:
```
icpx icx ifx
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

619.lbm_s: `basepeak = yes`

638.imagick_s: `basepeak = yes`

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Peak Optimization Flags (Continued)

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/Intel-ic2023-official-linux64.html`
`http://www.spec.org/cpu2017/flags/Nettrix-Platform-Settings-V1.3-SPR-revA.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml`
`http://www.spec.org/cpu2017/flags/Nettrix-Platform-Settings-V1.3-SPR-revA.xml`

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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