SPEC CPU®2017 Floating Point Rate Result

Inspur Electronic Information Industry Co., Ltd. (IEI)

$SPECrate^®2017\_fp\_base = 263$

NF5280M7 (Intel Xeon Gold 5411N)

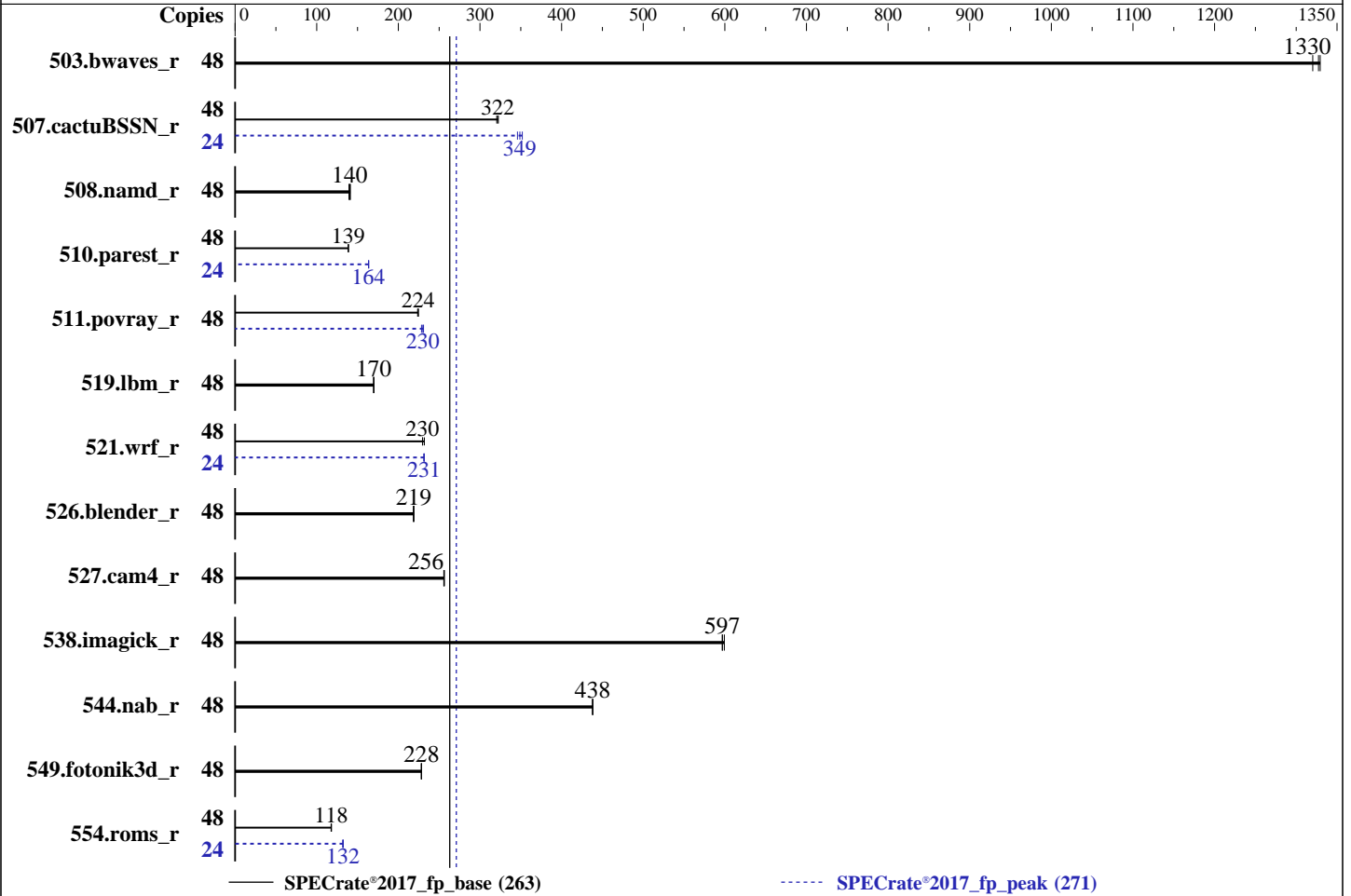$SPECrate^®2017\_fp\_peak = 271$

CPU2017 License: 3358

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Mar-2023

Hardware Availability: Apr-2023

Software Availability: Feb-2023

Benchmark	Copies	base	peak
503.bwaves_r	48	1330	
507.cactuBSSN_r	48 / 24	322	349
508.namd_r	48	140	
510.parest_r	48 / 24	139	164
511.povray_r	48	224	230
519.lbm_r	48	170	
521.wrf_r	48 / 24	230	231
526.blender_r	48	219	
527.cam4_r	48	256	
538.imagick_r	48	597	
544.nab_r	48	438	
549.fotonik3d_r	48	228	
554.roms_r	48 / 24	118	132

— SPECrate®2017_fp_base (263)   ····· SPECrate®2017_fp_peak (271)

Hardware

CPU Name: Intel Xeon Gold 5411N
 Max MHz: 3900
 Nominal: 1900
Enabled: 24 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: 45 MB I+D on chip per chip
 Other: None
Memory: 256 GB (8 x 32 GB 2Rx4 PC5-4800B-R, running at 4400)
Storage: 1 x 1 TB NVME SSD
Other: None

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
 5.14.0-70.22.1.el9_0.x86_64
Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 03.01.00 released Dec-2022
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.

https://www.spec.org/

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Inspur Electronic Information Industry Co., Ltd. (IEI)	SPECrate®2017_fp_base = 263
NF5280M7 (Intel Xeon Gold 5411N)	SPECrate®2017_fp_peak = 271

CPU2017 License: 3358		**Test Date:**	Mar-2023
Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)		**Hardware Availability:**	Apr-2023
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Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
503.bwaves_r	48	365	1320	**363**	**1330**	362	1330	48	365	1320	**363**	**1330**	362	1330
507.cactuBSSN_r	48	**189**	**322**	190	321	188	323	24	**87.1**	**349**	86.4	352	87.8	346
508.namd_r	48	**325**	**140**	327	139	323	141	48	**325**	**140**	327	139	323	141
510.parest_r	48	906	139	904	139	**905**	**139**	24	384	164	**384**	**164**	384	164
511.povray_r	48	501	224	**499**	**224**	499	224	48	486	231	491	228	**487**	**230**
519.lbm_r	48	**298**	**170**	298	170	298	170	48	**298**	**170**	298	170	298	170
521.wrf_r	48	468	230	**468**	**230**	464	232	24	232	231	232	232	**232**	**231**
526.blender_r	48	335	218	334	219	**334**	**219**	48	335	218	334	219	**334**	**219**
527.cam4_r	48	327	256	328	256	**328**	**256**	48	327	256	328	256	**328**	**256**
538.imagick_r	48	200	597	**200**	**597**	199	599	48	200	597	**200**	**597**	199	599
544.nab_r	48	184	438	185	438	**184**	**438**	48	184	438	185	438	**184**	**438**
549.fotonik3d_r	48	819	228	**819**	**228**	820	228	48	819	228	**819**	**228**	820	228
554.roms_r	48	647	118	**647**	**118**	649	118	24	288	133	289	132	**289**	**132**

SPECrate®2017_fp_base =	**263**
SPECrate®2017_fp_peak =	**271**

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

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"

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
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>

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)

(Continued on next page)

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General Notes (Continued)

```
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
```

Platform Notes

```
BIOS configuration:
ENERGY_PERF_BIAS_CFG mode set to Performance
Hardware Prefetch set to Disable
VT Support set to Disable
Sub NUMA Cluster (SNC) set to SNC4

Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Mon Mar 27 19:35:03 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 250 (250-6.el9_0)
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. cpupower frequency-info
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
  Linux localhost.localdomain 5.14.0-70.22.1.el9_0.x86_64 #1 SMP PREEMPT Tue Aug 2 10:02:12 EDT 2022 x86_64
  x86_64 x86_64 GNU/Linux


------------------------------------------------------------
2. w
```

(Continued on next page)

Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280M7 (Intel Xeon Gold 5411N)

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Platform Notes (Continued)

```
   19:35:03 up  6:18,  1 user,  load average: 30.72, 43.55, 46.26
   USER     TTY         LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1        13:16    6:17m  1.13s  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
  data seg size               (kbytes, -d) unlimited
  scheduling priority              (-e) 0
  file size                   (blocks, -f) unlimited
  pending signals                  (-i) 1030062
  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) 1030062
  virtual memory              (kbytes, -v) unlimited
  file locks                       (-x) unlimited


  -----------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 18
 login -- root
 -bash
 -bash
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=48 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=24 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=48 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=24 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
   --runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.017/templogs/preenv.fprate.017.0.log --lognum 017.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/CPU2017


  -----------------------------------------------------------
6. /proc/cpuinfo
   model name      : Intel(R) Xeon(R) Gold 5411N
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 143
   stepping        : 8
   microcode       : 0x2b000130
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
   cpu cores       : 24
   siblings        : 48
   1 physical ids (chips)
   48 processors (hardware threads)
   physical id 0: core ids 0-23
   physical id 0: apicids 0-47
```

(Continued on next page)

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SPECrate®2017_fp_base = 263

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Platform Notes (Continued)

```
    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:               52 bits physical, 57 bits virtual
      Byte Order:                  Little Endian
      CPU(s):                      48
      On-line CPU(s) list:         0-47
      Vendor ID:                   GenuineIntel
      BIOS Vendor ID:              Intel(R) Corporation
      Model name:                  Intel(R) Xeon(R) Gold 5411N
      BIOS Model name:             Intel(R) Xeon(R) Gold 5411N
      CPU family:                  6
      Model:                       143
      Thread(s) per core:          2
      Core(s) per socket:          24
      Socket(s):                   1
      Stepping:                    8
      CPU max MHz:                 3900.0000
      CPU min MHz:                 800.0000
      BogoMIPS:                    3800.00
      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 ds_cpl
                                   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 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 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 flush_l1d arch_capabilities
      L1d cache:                   1.1 MiB (24 instances)
      L1i cache:                   768 KiB (24 instances)
      L2 cache:                    48 MiB (24 instances)
      L3 cache:                    45 MiB (1 instance)
      NUMA node(s):                2
      NUMA node0 CPU(s):           0-11,24-35
      NUMA node1 CPU(s):           12-23,36-47
      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
      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
```

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Platform Notes (Continued)

```
From lscpu --cache:
    NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
    L1d      48K     1.1M   12 Data            1    64       1             64
    L1i      32K     768K    8 Instruction     1    64       1             64
    L2        2M      48M   16 Unified         2  2048       1             64
    L3       45M      45M   15 Unified         3 49152       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: 0-11,24-35
  node 0 size: 128547 MB
  node 0 free: 115179 MB
  node 1 cpus: 12-23,36-47
  node 1 size: 129007 MB
  node 1 free: 117654 MB
  node distances:
  node   0   1
    0:  10  12
    1:  12  10


------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       263736964 kB


------------------------------------------------------------
10. who -r
  run-level 3 Mar 27 13:16


------------------------------------------------------------
11. Systemd service manager version: systemd 250 (250-6.el9_0)
  Default Target  Status
  multi-user      degraded


------------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
    UNIT                  LOAD   ACTIVE SUB    DESCRIPTION
  * dnf-makecache.service loaded failed failed dnf makecache


------------------------------------------------------------
13. Services, from systemctl list-unit-files
  STATE           UNIT FILES
  enabled         NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
                  dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode
                  nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd
                  systemd-network-generator udisks2 upower
  enabled-runtime systemd-remount-fs
  disabled        arp-ethers blk-availability canberra-system-bootup canberra-system-shutdown
                  canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower debug-shell
                  kvm_stat man-db-restart-cache-update nftables podman podman-auto-update podman-restart
                  rdisc rhsm rhsm-facts rpmdb-rebuild 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


------------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.22.1.el9_0.x86_64
  root=/dev/mapper/rhel-root
  ro
```

(Continued on next page)

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Platform Notes (Continued)

```
    resume=/dev/mapper/rhel-swap
    rd.lvm.lv=rhel/root
    rd.lvm.lv=rhel/swap


  ----------------------------------------------------------
15. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 800 MHz and 3.90 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes


  ----------------------------------------------------------
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                     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 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)
```

(Continued on next page)

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Platform Notes (Continued)

```
        ----------------------------------------------------------
        20. Disk information
        SPEC is set to: /home/CPU2017
          Filesystem            Type  Size  Used Avail Use% Mounted on
          /dev/mapper/rhel-home xfs   819G  190G  630G  24% /home

        ----------------------------------------------------------
        21. /sys/devices/virtual/dmi/id
            Vendor:        IEI
            Product:       NF5280M7
            Product Family: Not specified
            Serial:        000000000

        ----------------------------------------------------------
        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:
            8x Samsung M321R4GA3BB6-CQKVG 32 GB 2 rank 4800, configured at 4400


        ----------------------------------------------------------
        23. BIOS
        (This section combines info from /sys/devices and dmidecode.)
          BIOS Vendor:      American Megatrends International, LLC.
          BIOS Version:     03.01.00
          BIOS Date:        12/29/2022
```

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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
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 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.
------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
```

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Compiler Version Notes (Continued)

```
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
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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 2023.0.0 Build 20221201
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==========================================================================================
Fortran, C     | 521.wrf_r(base, peak) 527.cam4_r(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
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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`

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Inspur Electronic Information Industry Co., Ltd. (IEI)

SPECrate®2017_fp_base = 263

NF5280M7 (Intel Xeon Gold 5411N)

SPECrate®2017_fp_peak = 271

CPU2017 License: 3358   **Test Date:** Mar-2023
Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)   **Hardware Availability:** Apr-2023
Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)   **Software Availability:** Feb-2023

Base Portability Flags (Continued)

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

Base Optimization Flags

C benchmarks:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -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 -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -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 -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280M7 (Intel Xeon Gold 5411N)

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CPU2017 License: 3358
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Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Mar-2023
Hardware Availability: Apr-2023
Software Availability: Feb-2023

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```
-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-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
```

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`

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Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280M7 (Intel Xeon Gold 5411N)

SPECrate®2017_fp_base = 263

SPECrate®2017_fp_peak = 271

CPU2017 License: 3358

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

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Test Date: Mar-2023

Hardware Availability: Apr-2023

Software Availability: Feb-2023

Peak Optimization Flags (Continued)

544.nab_r: `basepeak = yes`

C++ benchmarks:

508.namd_r: `basepeak = yes`

510.parest_r: `-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -mprefer-vector-width=512 -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 -xsapphirerapids -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:

521.wrf_r: `-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512 -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.profdata(pass 2) -xCORE-AVX2(pass 1) -flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512 -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

526.blender_r: `basepeak = yes`

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Inspur Electronic Information Industry Co., Ltd. (IEI)

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Test Date: Mar-2023

Hardware Availability: Apr-2023

Software Availability: Feb-2023

Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```
-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-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/Intel-ic2023-official-linux64.html

http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-intel-V3.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/Inspur-Platform-Settings-intel-V3.xml

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

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