SPEC CPU®2017 Floating Point Speed Result

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Fujitsu

PRIMERGY RX2540 M7, Intel Xeon Max 9480, 1.90GHz

$SPECspeed^{®}2017\_fp\_base =$ **335**

$SPECspeed^{®}2017_fp_peak = $ Not Run

CPU2017 License: 19	**Test Date:** Jun-2023
Test Sponsor: Fujitsu	**Hardware Availability:** Mar-2023
Tested by: Fujitsu	**Software Availability:** Dec-2022

Threads

- **603.bwaves_s** **112** — 1530
- **607.cactuBSSN_s** **112** — 372
- **619.lbm_s** **112** — 331
- **621.wrf_s** **112** — 149
- **627.cam4_s** **112** — 135
- **628.pop2_s** **112** — 92.6
- **638.imagick_s** **112** — 540
- **644.nab_s** **112** — 680
- **649.fotonik3d_s** **112** — 231
- **654.roms_s** **112** — 593

Scale: 0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1550

—— **SPECspeed®2017_fp_base (335)**

Hardware

CPU Name: Intel Xeon Max 9480
Max MHz: 3500
Nominal: 1900
Enabled: 112 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: 112.5 MB I+D on chip per chip
 Other: None
Memory: 1152 GB (16 x 64 GB 2Rx4 PC5-4800B-R + 2 x 64 GB HBM)
Storage: 1 x SATA SSD, 1.92TB
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 for Linux;
Parallel: Yes
Firmware: Fujitsu BIOS Version V1.0.0.0 R1.10.0 for D3983-A1x. Released Mar-2023
 tested as V1.0.0.0 R1.1.0 for D3983-A1x Feb-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS set to prefer performance at the cost of additional power usage

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

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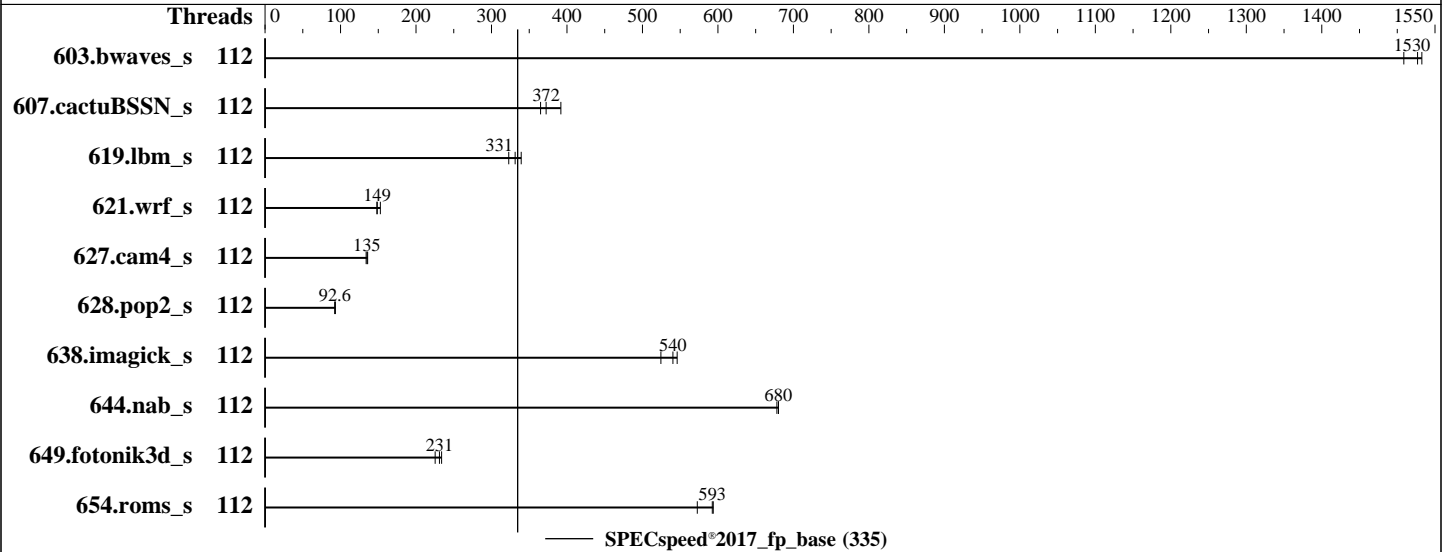SPECspeed®2017_fp_peak = Not Run

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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	39.1	1510	38.5	1530	**38.6**	**1530**							
607.cactuBSSN_s	112	**44.8**	**372**	45.7	365	42.5	392							
619.lbm_s	112	16.2	323	**15.8**	**331**	15.4	339							
621.wrf_s	112	89.3	148	86.6	153	**89.0**	**149**							
627.cam4_s	112	66.2	134	**65.6**	**135**	65.2	136							
628.pop2_s	112	128	93.1	128	92.5	**128**	**92.6**							
638.imagick_s	112	27.5	524	26.4	546	**26.7**	**540**							
644.nab_s	112	25.7	680	**25.7**	**680**	25.8	678							
649.fotonik3d_s	112	39.0	234	**39.5**	**231**	40.5	225							
654.roms_s	112	27.5	573	26.5	594	**26.6**	**593**							
SPECspeed®2017_fp_base =			**335**											
SPECspeed®2017_fp_peak =			**Not Run**											

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,1,0"
LD_LIBRARY_PATH = "/home/benchmark/speccpu-1.1.9/lib/intel64:/home/benchmark/speccpu-1.1.9/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
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
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS configuration:
Hyper-Threading = Disabled
```

(Continued on next page)

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Platform Notes (Continued)

```
DCU Ip Prefetcher = Disabled
Package C State limit = C0
Volatile Memory Mode = 2LM
LLC Prefetch = Enabled
Stale AtoS (Directory AtoS) = Disabled
DBP-F = Enabled
CPU Performance Boost = Aggressive
Fan Control = Full

Sysinfo program /home/benchmark/speccpu-1.1.9/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Wed Jun 14 09:53:49 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. 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 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222/lp)
  x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   09:53:49 up 1 min,  1 user,  load average: 3.45, 1.90, 0.73
  USER     TTY        FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     pts/0    10.118.163.62     09:53   13.00s  2.41s  0.29s
  /home/benchmark/ptu_v4.0/UNIFIED_SERVER_PTAT_V4.0.0_20230110/ptat -mon -i 5000000 -filter 0x3f -y -ts -csv
  -log

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

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Platform Notes (Continued)

```
          ----------------------------------------------------------
          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) 4125337
            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) 4125337
            virtual memory          (kbytes, -v) unlimited
            file locks                      (-x) unlimited


          ----------------------------------------------------------
          5. sysinfo process ancestry
           /usr/lib/systemd/systemd --switched-root --system --deserialize 30
           sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
           sshd: root@pts/0
           -bash
           -bash
           runcpu --nobuild --action validate --define default-platform-flags -c
             ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=112 --tune base -o all --define drop_caches
             --define smt-on fpspeed
           runcpu --nobuild --action validate --define default-platform-flags --configfile
             ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=112 --tune base --output_format all --define
             drop_caches --define smt-on --nopower --runmode speed --tune base --size refspeed fpspeed --nopreenv
             --note-preenv --logfile $SPEC/tmp/CPU2017.001/templogs/preenv.fpspeed.001.0.log --lognum 001.0
             --from_runcpu 2
           specperl $SPEC/bin/sysinfo
          $SPEC = /home/benchmark/speccpu-1.1.9


          ----------------------------------------------------------
          6. /proc/cpuinfo
            model name       : Intel (R) Xeon (R) CPU Max 9480
            vendor_id        : GenuineIntel
            cpu family       : 6
            model            : 143
            stepping         : 8
            microcode        : 0x2c000120
            bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs
            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
```

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Platform Notes (Continued)

```
   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
  On-line CPU(s) list:             0-111
  Vendor ID:                       GenuineIntel
  Model name:                      Intel (R) Xeon (R) CPU Max 9480
  CPU family:                      6
  Model:                           143
  Thread(s) per core:              1
  Core(s) per socket:              56
  Socket(s):                       2
  Stepping:                        8
  CPU max MHz:                     3500.0000
  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 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 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:                       5.3 MiB (112 instances)
  L1i cache:                       3.5 MiB (112 instances)
  L2 cache:                        224 MiB (112 instances)
  L3 cache:                        225 MiB (2 instances)
  NUMA node(s):                    2
  NUMA node0 CPU(s):               0-55
  NUMA node1 CPU(s):               56-111
  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:
```

(Continued on next page)

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Platform Notes (Continued)

```
      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    112.5M     225M  15 Unified         3 122880      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: 0-55
      node 0 size: 515627 MB
      node 0 free: 514064 MB
      node 1 cpus: 56-111
      node 1 size: 515730 MB
      node 1 free: 514997 MB
      node distances:
      node   0   1
        0:  10  26
        1:  26  10


    ----------------------------------------------------------------
    9. /proc/meminfo
      MemTotal:       1056111220 kB


    ----------------------------------------------------------------
    10. who -r
      run-level 3 Jun 14 09:52


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


    ----------------------------------------------------------------
    12. Failed units, from systemctl list-units --state=failed
        UNIT          LOAD   ACTIVE SUB    DESCRIPTION
      * sep5.service loaded failed failed systemd script to load sep5 driver at boot time


    ----------------------------------------------------------------
    13. Services, from systemctl list-unit-files
      STATE           UNIT FILES
      enabled         YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron display-manager getty@
                      haveged irqbalance iscsi issue-generator kbdsettings kdump kdump-early klog lvm2-monitor
                      nscd postfix purge-kernels rollback rsyslog sep5 smartd sshd wicked wickedd-auto4
                      wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
      enabled-runtime systemd-remount-fs
      disabled        accounts-daemon appstream-sync-cache autofs autoyast-initscripts blk-availability
                      bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd console-getty cups
                      cups-browsed debug-shell ebtables exchange-bmc-os-info firewalld gpm grub2-once
                      haveged-switch-root ipmi ipmievd iscsi-init iscsid iscsiuio issue-add-ssh-keys kexec-load
                      lunmask man-db-create multipathd nfs nfs-blkmap nmb ostree-remount rdisc rpcbind
                      rpmconfigcheck rsyncd rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd snmptrapd
                      speech-dispatcherd systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                      systemd-time-wait-sync systemd-timesyncd udisks2 upower
      indirect        wickedd


    ----------------------------------------------------------------
    14. Linux kernel boot-time arguments, from /proc/cmdline
      BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
```

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Platform Notes (Continued)

```
  root=UUID=0e5beafe-73ba-4cb4-b738-5343b4292867
  splash=silent
  mitigations=auto
  quiet
  security=apparmor
  crashkernel=322M,high
  crashkernel=72M,low


  -------------------------------------------------------------
15. cpupower frequency-info
  analyzing CPU 0:
     current policy: frequency should be within 800 MHz and 3.50 GHz.
                     The governor "powersave" 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
```

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Platform Notes (Continued)

```
   os-release SUSE Linux Enterprise Server 15 SP4


   ----------------------------------------------------------
   20. Disk information
   SPEC is set to: /home/benchmark/speccpu-1.1.9
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda2      xfs   1.8T  117G  1.7T   7% /


   ----------------------------------------------------------
   21. /sys/devices/virtual/dmi/id
       Vendor:         FUJITSU
       Product:        PRIMERGY RX2540 M7
       Product Family: SERVER
       Serial:         EWCExxxxxx


   ----------------------------------------------------------
   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:
       8x Intel  16 GB 1 rank 3200
       2x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800
       8x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800
       6x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800



   ----------------------------------------------------------
   23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
       BIOS Vendor:     FUJITSU
       BIOS Version:    V1.0.0.0 R1.1.0 for D3983-A1x
       BIOS Date:       02/03/2023
       BIOS Revision:   1.1
       Firmware Revision: 2.0
   Each Intel Xeon CPU Max processor is configured with 64 GB of High Bandwidth Memory (HBM)
   in-package. dmidecode is additionally reporting the capacity of the CPU in-package
   HBM stack as: '8x Intel 16 GB 1 rank 3200'
```

Compiler Version Notes

```
==============================================================================================
C                 | 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
----------------------------------------------------------------------------------------------
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)
----------------------------------------------------------------------------------------------
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.
----------------------------------------------------------------------------------------------
```

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Tested by:	Fujitsu	**Software Availability:**	Dec-2022

Compiler Version Notes (Continued)

```
==============================================================================
Fortran    | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
------------------------------------------------------------------------------
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) 627.cam4_s(base) 628.pop2_s(base)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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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`

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`

SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2023 Standard Performance Evaluation Corporation

Fujitsu
PRIMERGY RX2540 M7, Intel Xeon Max 9480, 1.90GHz

SPECspeed®2017_fp_base = 335

SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

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

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
-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
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-SPR-RevC.html
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-SPR-RevC.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml

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

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