SPEC CPU®2017 Floating Point Rate Result

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Supermicro
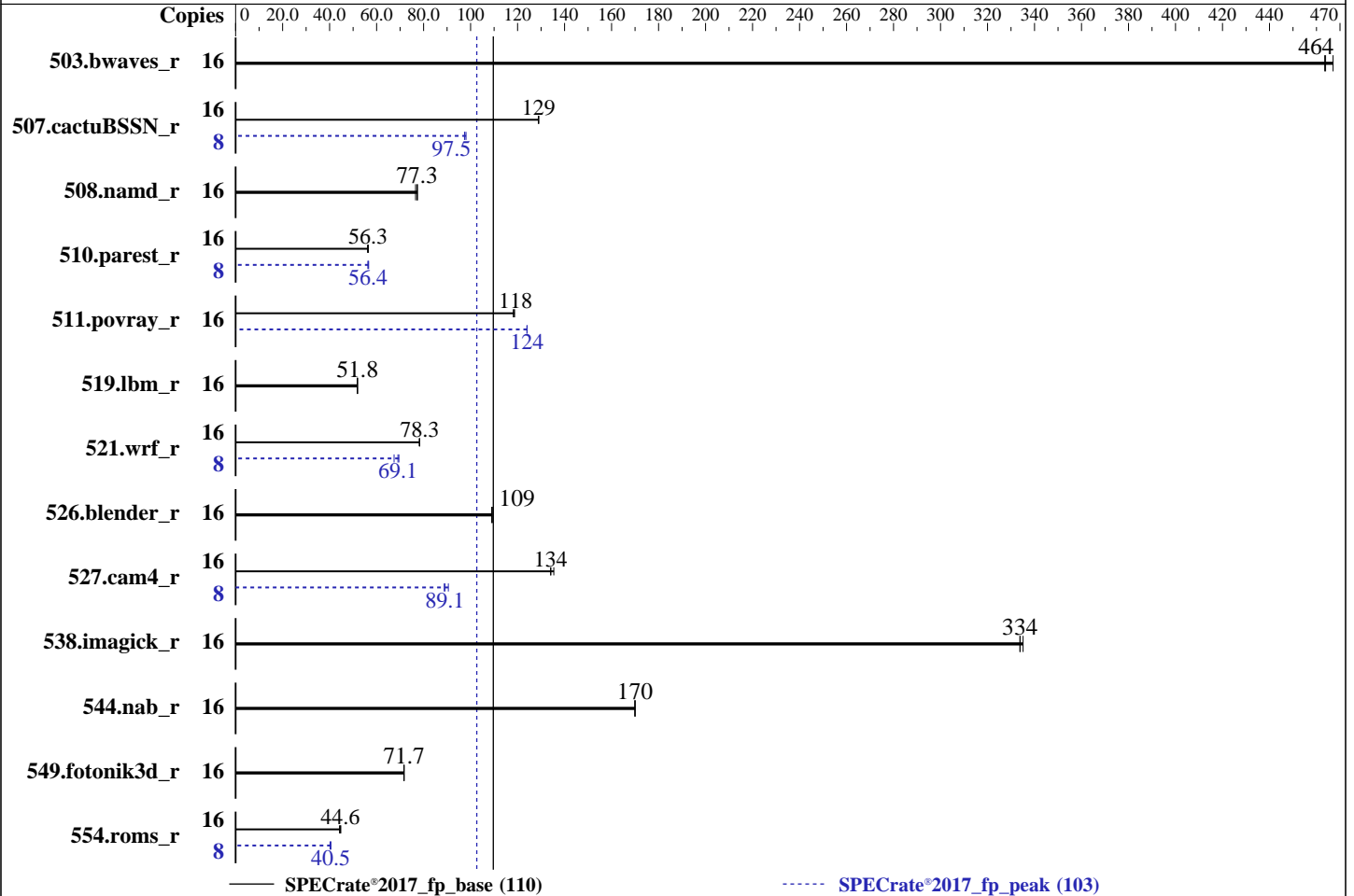
UP SuperServer SYS-511R-M
(X13SCH-SYS , Intel Xeon E-2488)

$SPECrate^{®}2017\_fp\_base = 110$

$SPECrate^{®}2017\_fp\_peak = 103$

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Benchmark	Copies	Base	Peak
503.bwaves_r	16	464	
507.cactuBSSN_r	16	129	
	8		97.5
508.namd_r	16	77.3	
510.parest_r	16	56.3	
	8		56.4
511.povray_r	16	118	
	16		124
519.lbm_r	16	51.8	
521.wrf_r	16	78.3	
	8		69.1
526.blender_r	16	109	
527.cam4_r	16	134	
	8		89.1
538.imagick_r	16	334	
544.nab_r	16	170	
549.fotonik3d_r	16	71.7	
554.roms_r	16	44.6	
	8		40.5

SPECrate®2017_fp_base (110)   SPECrate®2017_fp_peak (103)

Hardware

CPU Name: Intel Xeon E-2488
Max MHz: 5600
Nominal: 3200
Enabled: 8 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: 24 MB I+D on chip per chip
 Other: None
Memory: 64 GB (2 x 32 GB 2Rx8 PC5-4800B-U, running at 4400)
Storage: 1 x 512 GB M.2 NVMe SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP5
 Kernel 5.14.21-150500.53-default
Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 1.1 released Dec-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: Default

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Test Sponsor: Supermicro	**Hardware Availability:** Dec-2023
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Results Table

Benchmark	Base						Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	16	344	467	346	463	**346**	**464**	16	344	467	346	463	**346**	**464**
507.cactuBSSN_r	16	**157**	**129**	157	129	157	129	8	104	97.4	103	98.1	**104**	**97.5**
508.namd_r	16	198	76.6	**197**	**77.3**	196	77.4	16	198	76.6	**197**	**77.3**	196	77.4
510.parest_r	16	**743**	**56.3**	741	56.5	745	56.2	8	371	56.3	370	56.6	**371**	**56.4**
511.povray_r	16	316	118	315	119	**316**	**118**	16	301	124	301	124	**301**	**124**
519.lbm_r	16	**325**	**51.8**	325	51.8	325	51.9	16	**325**	**51.8**	325	51.8	325	51.9
521.wrf_r	16	457	78.3	**458**	**78.3**	459	78.2	8	**259**	**69.1**	266	67.4	258	69.5
526.blender_r	16	224	109	**223**	**109**	223	109	16	224	109	**223**	**109**	223	109
527.cam4_r	16	209	134	207	135	**209**	**134**	8	158	88.8	**157**	**89.1**	155	90.5
538.imagick_r	16	119	334	119	335	**119**	**334**	16	119	334	119	335	**119**	**334**
544.nab_r	16	**158**	**170**	158	170	158	170	16	**158**	**170**	158	170	158	170
549.fotonik3d_r	16	870	71.7	**870**	**71.7**	870	71.7	16	870	71.7	**870**	**71.7**	870	71.7
554.roms_r	16	568	44.8	**571**	**44.6**	575	44.2	8	316	40.2	314	40.5	**314**	**40.5**
SPECrate®2017_fp_base =	**110**											
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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

```
   The taskset mechanism was used to bind copies to processors. The config file option 'submit'
   was used to generate taskset 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
 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)
```

(Continued on next page)

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General Notes (Continued)

```
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

```
 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on 135-172-248 Thu Dec 21 00:07:03 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 249 (249.16+suse.171.gdad0071f15)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
 16. /sys/kernel/mm/transparent_hugepage
 17. /sys/kernel/mm/transparent_hugepage/khugepaged
 18. OS release
 19. Disk information
 20. /sys/devices/virtual/dmi/id
 21. dmidecode
 22. BIOS
 ------------------------------------------------------------

 ------------------------------------------------------------
 1. uname -a
   Linux 135-172-248 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043)
   x86_64 x86_64 x86_64 GNU/Linux

 ------------------------------------------------------------
 2. w
   00:07:03 up  5:22,  1 user,  load average: 14.69, 15.83, 15.95
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                18:49    4:37m  0.66s  0.01s -bash

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

 ------------------------------------------------------------
 4. ulimit -a
   core file size          (blocks, -c) unlimited
```

(Continued on next page)

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Platform Notes (Continued)

```
   data seg size              (kbytes, -d) unlimited
   scheduling priority             (-e) 0
   file size               (blocks, -f) unlimited
   pending signals                 (-i) 256559
   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) 256559
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited


   ----------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 30
 login -- root
 -bash
 -bash
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 -c
   ic2023.2.3-lin-core-avx2-rate-20231121.cfg --define smt-on --define cores=8 --define physicallogical
   --define no-numa --tune base,peak -o all --define drop_caches fprate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 --configfile
   ic2023.2.3-lin-core-avx2-rate-20231121.cfg --define smt-on --define cores=8 --define physicallogical
   --define no-numa --tune base,peak --output_format all --define drop_caches --nopower --runmode rate --tune
   base:peak --size refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017


   ----------------------------------------------------------
6. /proc/cpuinfo
   model name        : Intel(R) Xeon(R) E E-2488
   vendor_id         : GenuineIntel
   cpu family        : 6
   model             : 183
   stepping          : 1
   microcode         : 0x11f
   bugs              : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
   cpu cores         : 8
   siblings          : 16
   1 physical ids (chips)
   16 processors (hardware threads)
   physical id 0: core ids 0-7
   physical id 0: apicids 0-15
  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:              42 bits physical, 48 bits virtual
   Byte Order:                 Little Endian
   CPU(s):                     16
```

(Continued on next page)

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Platform Notes (Continued)

```
  On-line CPU(s) list:        0-15
  Vendor ID:                  GenuineIntel
  Model name:                 Intel(R) Xeon(R) E E-2488
  CPU family:                 6
  Model:                      183
  Thread(s) per core:         2
  Core(s) per socket:         8
  Socket(s):                  1
  Stepping:                   1
  Frequency boost:            enabled
  CPU max MHz:                3201.0000
  CPU min MHz:                800.0000
  BogoMIPS:                   6374.40
  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 sse4_1 sse4_2
                              x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm
                              abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd ibrs ibpb stibp
                              ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase
                              tsc_adjust bmi1 avx2 smep bmi2 erms invpcid rdseed adx smap clflushopt
                              clwb intel_pt sha_ni xsaveopt xsavec xgetbv1 xsaves split_lock_detect
                              avx_vnni dtherm ida arat pln pts hfi umip pku ospke waitpkg gfni vaes
                              vpclmulqdq tme rdpid movdiri movdir64b fsrm md_clear serialize pconfig
                              arch_lbr flush_l1d arch_capabilities
  Virtualization:             VT-x
  L1d cache:                  384 KiB (8 instances)
  L1i cache:                  256 KiB (8 instances)
  L2 cache:                   16 MiB (8 instances)
  L3 cache:                   24 MiB (1 instance)
  NUMA node(s):               1
  NUMA node0 CPU(s):          0-15
  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
  Vulnerability Tsx async abort: Not affected

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d      48K     384K   12 Data            1    64       1            64
      L1i      32K     256K    8 Instruction     1    64       1            64
      L2        2M      16M   16 Unified         2  2048       1            64
      L3       24M      24M   12 Unified         3 32768       1            64

  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 1 nodes (0)
    node 0 cpus: 0-15
    node 0 size: 64170 MB
    node 0 free: 51384 MB
```

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Platform Notes (Continued)

```
  node distances:
  node   0
    0:  10


  ------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       65710780 kB


  ------------------------------------------------------------
10. who -r
  run-level 3 Dec 20 18:45


  ------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)
   Default Target  Status
   multi-user      running


  ------------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager getty@ irqbalance
                   issue-generator kbdsettings klog lvm2-monitor nscd nvmefc-boot-connections postfix
                   purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked wickedd-auto4
                   wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
   enabled-runtime systemd-remount-fs
   disabled        autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                   chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                   firewalld gpm grub2-once haveged haveged-switch-root ipmi ipmievd issue-add-ssh-keys
                   kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nvmf-autoconnect rpcbind
                   rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd
                   systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                   systemd-time-wait-sync systemd-timesyncd udisks2 vncserver@
   indirect        wickedd


  ------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
   root=UUID=9de9855c-b179-4e5b-8330-3742dedc18b2
   splash=silent
   mitigations=auto
   quiet
   security=apparmor


  ------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 800 MHz and 3.20 GHz.
                    The governor "ondemand" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes


  ------------------------------------------------------------
15. sysctl
   kernel.numa_balancing            0
   kernel.randomize_va_space        2
   vm.compaction_proactiveness      20
   vm.dirty_background_bytes        0
   vm.dirty_background_ratio        10
```

(Continued on next page)

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Platform Notes (Continued)

```
   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


   ----------------------------------------------------------
16. /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


   ----------------------------------------------------------
17. /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


   ----------------------------------------------------------
18. OS release
   From /etc/*-release /etc/*-version
   os-release SUSE Linux Enterprise Server 15 SP5


   ----------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p2 xfs   475G   35G  440G   8% /


   ----------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:        Supermicro
    Product:       Super Server
    Serial:        0123456789


   ----------------------------------------------------------
21. dmidecode
   Additional information from dmidecode 3.4 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:
     2x Micron Technology MTC16C2085S1UC48BA1 32 GB 2 rank 4800, configured at 4400


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

(Continued on next page)

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Platform Notes (Continued)

```
   22. BIOS
   (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:        American Megatrends International, LLC.
     BIOS Version:       1.1
     BIOS Date:          12/08/2023
     BIOS Revision:      5.27
```

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 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
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 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
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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`
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 -xCORE-AVX2 -Ofast -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-Wno-implicit-int -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

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

Supermicro

UP SuperServer SYS-511R-M
(X13SCH-SYS , Intel Xeon E-2488)

SPECrate®2017_fp_base = 110

SPECrate®2017_fp_peak = 103

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Dec-2023
Hardware Availability: Dec-2023
Software Availability: Dec-2023

Base Optimization Flags (Continued)

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -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 -xCORE-AVX2 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -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 -xCORE-AVX2 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:
```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -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
```

(Continued on next page)

Supermicro

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Peak Compiler Invocation (Continued)

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`

544.nab_r: `basepeak = yes`

C++ benchmarks:

508.namd_r: `basepeak = yes`

510.parest_r: `-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -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 -xCORE-AVX2 -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`

(Continued on next page)

Supermicro

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(X13SCH-SYS , Intel Xeon E-2488)

SPECrate®2017_fp_base = 110

SPECrate®2017_fp_peak = 103

CPU2017 License: 001176		**Test Date:**	Dec-2023
Test Sponsor: Supermicro		**Hardware Availability:**	Dec-2023
Tested by: Supermicro		**Software Availability:**	Dec-2023

Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -nostandard-realloc-lhs -align array32byte -auto
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

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 -flto
-Ofast -ffast-math -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

```
526.blender_r: basepeak = yes
```

Benchmarks using Fortran, C, and C++:

```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -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-ic2023p2-official-linux64.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-RKL-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-RKL-revB.xml

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

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