SPEC CPU®2017 Integer Rate Result

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xFusion

FusionServer 2288H V6 (Intel Xeon Silver 4316)

$SPECrate^{®}2017\_int\_base = 283$

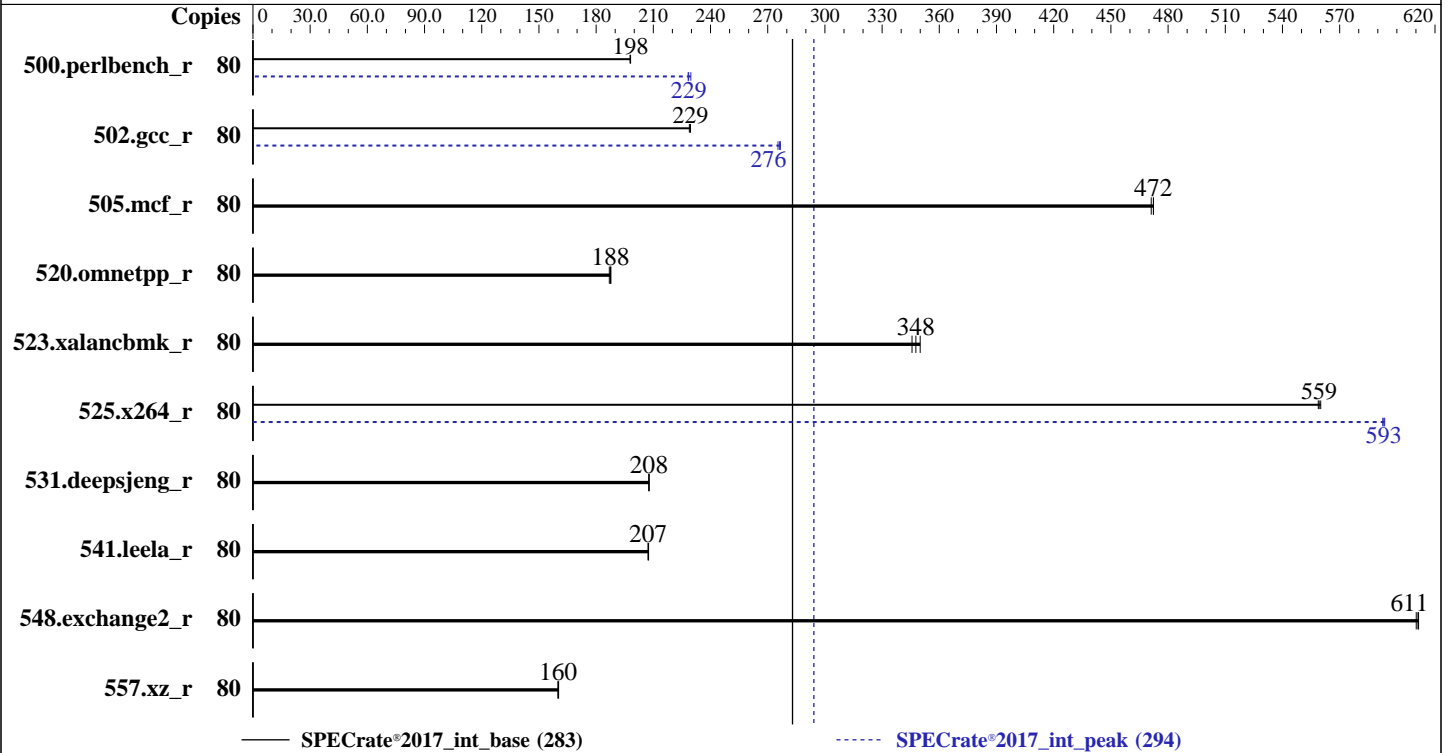$SPECrate^{®}2017\_int\_peak = 294$

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Apr-2024
Hardware Availability: Apr-2021
Software Availability: Dec-2023

Benchmark	Copies	base	peak
500.perlbench_r	80	198	229
502.gcc_r	80	229	276
505.mcf_r	80	472	
520.omnetpp_r	80	188	
523.xalancbmk_r	80	348	
525.x264_r	80	559	593
531.deepsjeng_r	80	208	
541.leela_r	80	207	
548.exchange2_r	80	611	
557.xz_r	80	160	

SPECrate®2017_int_base (283)   SPECrate®2017_int_peak (294)

Hardware

CPU Name: Intel Xeon Silver 4316
 Max MHz: 3400
 Nominal: 2300
Enabled: 40 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 1.25 MB I+D on chip per core
 L3: 30 MB I+D on chip per chip
 Other: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 2666)
Storage: 1 x 1920 GB SATA SSD
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
 5.14.0-70.13.1.el9_0.x86_64
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 1.68 Released Mar-2024
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

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

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	80	643	198	**643**	**198**	644	198	80	**557**	**229**	555	230	558	228
502.gcc_r	80	**494**	**229**	494	229	495	229	80	**410**	**276**	409	277	411	275
505.mcf_r	80	**274**	**472**	274	472	274	471	80	**274**	**472**	274	472	274	471
520.omnetpp_r	80	**560**	**188**	559	188	562	187	80	**560**	**188**	559	188	562	187
523.xalancbmk_r	80	241	350	244	346	**243**	**348**	80	241	350	244	346	**243**	**348**
525.x264_r	80	250	560	**250**	**559**	251	559	80	**236**	**593**	236	594	236	593
531.deepsjeng_r	80	**441**	**208**	441	208	441	208	80	**441**	**208**	441	208	441	208
541.leela_r	80	**639**	**207**	638	208	639	207	80	**639**	**207**	638	208	639	207
548.exchange2_r	80	343	611	344	610	**343**	**611**	80	343	611	344	610	**343**	**611**
557.xz_r	80	539	160	**540**	**160**	540	160	80	539	160	**540**	**160**	540	160
SPECrate®2017_int_base =		**283**												
SPECrate®2017_int_peak =		**294**												

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/spec2017-ic2023.2.3/lib/intel64:/home/spec2017-ic2023.2.3/lib/ia32:/home/spec2017-ic2023.2.3/je
    5.0.1-32"
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)
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.

(Continued on next page)

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$\text{SPECrate}^{®}\text{2017\_int\_peak} = 294$

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Test Date: Apr-2024
Hardware Availability: Apr-2021
Software Availability: Dec-2023

General Notes (Continued)

```
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:
Performance Profile Set to Performance
SNC Set to Enabled SNC2 (2-clusters)

Sysinfo program /home/spec2017-ic2023.2.3/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Thu Apr 18 22:39:51 2024

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 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14 12:42:38 EDT 2022 x86_64
  x86_64 x86_64 GNU/Linux


------------------------------------------------------------
2. w
  22:39:51 up 12:24,  2 users,  load average: 0.00, 0.00, 0.17
  USER     TTY          LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1         10:19    31.00s 1.50s  0.05s -bash
  root     pts/0        22:22    60.00s 0.00s  0.00s -bash

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

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Platform Notes (Continued)

```
  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) 2059968
    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) 2059968
    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 --define default-platform-flags --copies 80 -c ic2023.2.3-lin-core-avx512-rate-20231121.cfg --define
     smt-on --define cores=40 --define physicalfirst --define invoke_with_interleave --define drop_caches
     --tune base,peak -o all intrate
   runcpu --define default-platform-flags --copies 80 --configfile ic2023.2.3-lin-core-avx512-rate-20231121.cfg
     --define smt-on --define cores=40 --define physicalfirst --define invoke_with_interleave --define
     drop_caches --tune base,peak --output_format all --nopower --runmode rate --tune base:peak --size refrate
     intrate --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.003/templogs/preenv.intrate.003.0.log
     --lognum 003.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
  $SPEC = /home/spec2017-ic2023.2.3


  -------------------------------------------------------------
  6. /proc/cpuinfo
     model name      : Intel(R) Xeon(R) Silver 4316 CPU @ 2.30GHz
     vendor_id       : GenuineIntel
     cpu family      : 6
     model           : 106
     stepping        : 6
     microcode       : 0xd0003b9
     bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
     cpu cores       : 20
     siblings        : 40
     2 physical ids (chips)
     80 processors (hardware threads)
     physical id 0: core ids 0-19
     physical id 1: core ids 0-19
     physical id 0: apicids 0-39
     physical id 1: apicids 64-103
    Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
    virtualized systems.  Use the above data carefully.
```

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Platform Notes (Continued)

```
            -------------------------------------------------------------
            7. lscpu

            From lscpu from util-linux 2.37.4:
              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):                     80
              On-line CPU(s) list:        0-79
              Vendor ID:                  GenuineIntel
              BIOS Vendor ID:             Intel(R) Corporation
              Model name:                 Intel(R) Xeon(R) Silver 4316 CPU @ 2.30GHz
              BIOS Model name:            Intel(R) Xeon(R) Silver 4316 CPU @ 2.30GHz
              CPU family:                 6
              Model:                      106
              Thread(s) per core:         2
              Core(s) per socket:         20
              Socket(s):                  2
              Stepping:                   6
              CPU max MHz:                3400.0000
              CPU min MHz:                800.0000
              BogoMIPS:                   4600.00
              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 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 invpcid_single ssbd mba ibrs ibpb stibp
                                          ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase
                                          tsc_adjust bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq
                                          rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni
                                          avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
                                          cqm_mbm_total cqm_mbm_local split_lock_detect wbnoinvd dtherm ida arat pln
                                          pts hwp_epp avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
                                          avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid fsrm md_clear
                                          pconfig flush_l1d arch_capabilities
              Virtualization:             VT-x
              L1d cache:                  1.9 MiB (40 instances)
              L1i cache:                  1.3 MiB (40 instances)
              L2 cache:                   50 MiB (40 instances)
              L3 cache:                   60 MiB (2 instances)
              NUMA node(s):               4
              NUMA node0 CPU(s):          0-9,40-49
              NUMA node1 CPU(s):          10-19,50-59
              NUMA node2 CPU(s):          20-29,60-69
              NUMA node3 CPU(s):          30-39,70-79
              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

            From lscpu --cache:
                NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL  SETS PHY-LINE COHERENCY-SIZE
```

(Continued on next page)

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Platform Notes (Continued)

```
        L1d      48K     1.9M    12 Data          1    64      1        64
        L1i      32K     1.3M     8 Instruction   1    64      1        64
        L2       1.3M     50M    20 Unified       2  1024      1        64
        L3       30M      60M    12 Unified       3 40960      1        64


      ------------------------------------------------------------
      8. numactl --hardware
      NOTE: a numactl 'node' might or might not correspond to a physical chip.
        available: 4 nodes (0-3)
        node 0 cpus: 0-9,40-49
        node 0 size: 128020 MB
        node 0 free: 119407 MB
        node 1 cpus: 10-19,50-59
        node 1 size: 129019 MB
        node 1 free: 122106 MB
        node 2 cpus: 20-29,60-69
        node 2 size: 128983 MB
        node 2 free: 122230 MB
        node 3 cpus: 30-39,70-79
        node 3 size: 129008 MB
        node 3 free: 122285 MB
        node distances:
        node   0   1   2   3
          0:  10  11  20  20
          1:  11  10  20  20
          2:  20  20  10  11
          3:  20  20  11  10


      ------------------------------------------------------------
      9. /proc/meminfo
         MemTotal:       527392792 kB


      ------------------------------------------------------------
      10. who -r
        run-level 3 Apr 18 10:15


      ------------------------------------------------------------
      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         blk-availability canberra-system-bootup canberra-system-shutdown
                         canberra-system-shutdown-reboot chrony-wait console-getty cpupower debug-shell kvm_stat
                         man-db-restart-cache-update nftables 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
```

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Platform Notes (Continued)

```
     ----------------------------------------------------------------
     14. Linux kernel boot-time arguments, from /proc/cmdline
       BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
       root=/dev/mapper/rhel-root
       ro
       crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
       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 3.40 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

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

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Platform Notes (Continued)

```
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)

  -------------------------------------------------------------
20. Disk information
SPEC is set to: /home/spec2017-ic2023.2.3
  Filesystem              Type  Size  Used Avail Use% Mounted on
  /dev/mapper/rhel-home xfs   819G   44G  775G   6% /home

  -------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:        XFUSION
    Product:       2288H V6
    Product Family: Whitley

  -------------------------------------------------------------
22. dmidecode
  Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you interpret this section.
  The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
  determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
  "DMTF SMBIOS" standard.
  Memory:
    16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200, configured at 2666

  -------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
  BIOS Vendor:      XFUSION
  BIOS Version:     1.68
  BIOS Date:        03/14/2024
  BIOS Revision:    1.68
```

Compiler Version Notes

```
==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
        | 557.xz_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       | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
         | 557.xz_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++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
         | 541.leela_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.
------------------------------------------------------------------------------


==============================================================================
Fortran | 548.exchange2_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.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Base Portability Flags

500.perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502.gcc_r: `-DSPEC_LP64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LP64 -DSPEC_LINUX`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`

xFusion

FusionServer 2288H V6 (Intel Xeon Silver 4316)

SPECrate®2017_int_base = 283

SPECrate®2017_int_peak = 294

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Apr-2024
Hardware Availability: Apr-2021
Software Availability: Dec-2023

Base Optimization Flags

C benchmarks:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

Peak Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

Peak Portability Flags

500.perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502.gcc_r: `-D_FILE_OFFSET_BITS=64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LP64 -DSPEC_LINUX`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`

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Peak Portability Flags (Continued)

557.xz_r: `-DSPEC_LP64`

Peak Optimization Flags

C benchmarks:

500.perlbench_r: `-w -std=c11 -m64 -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`
`-fno-strict-overflow`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

502.gcc_r: `-m32`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/ia32_lin`
`-std=gnu89 -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`
`-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc`

505.mcf_r: `basepeak = yes`

525.x264_r: `-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -fno-alias`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `basepeak = yes`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

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Peak Optimization Flags (Continued)

Fortran benchmarks:

548.exchange2_r: basepeak = yes

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/xFusion-Platform-Settings-ICX-V1.2.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/xFusion-Platform-Settings-ICX-V1.2.xml

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

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