SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)
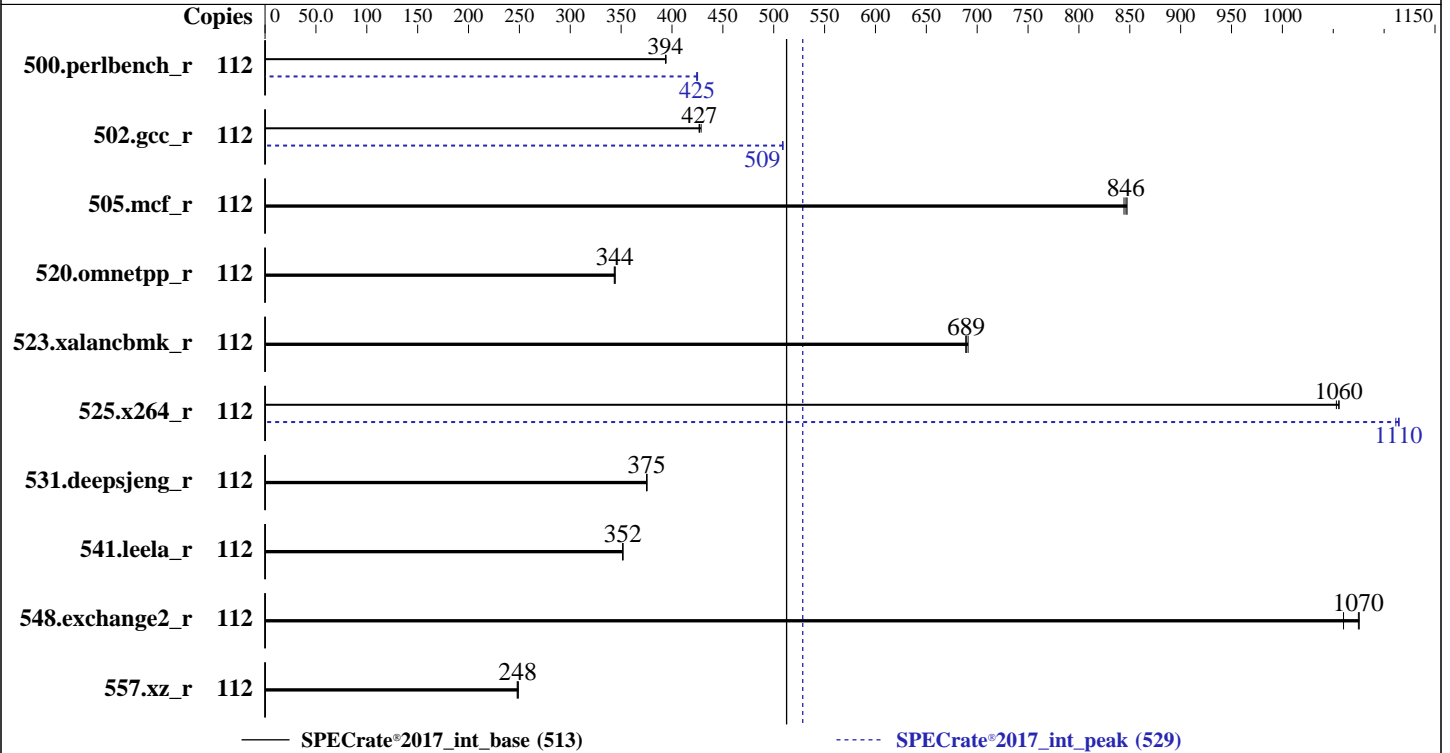
ProLiant ML350 Gen11
(2.20 GHz, Intel Xeon Gold 5520+)

$SPECrate®2017\_int\_base = 513$

$SPECrate®2017\_int\_peak = 529$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Mar-2024

Hardware Availability: Feb-2024

Software Availability: Dec-2023

Benchmark	Copies	Base	Peak
500.perlbench_r	112	394	425
502.gcc_r	112	427	509
505.mcf_r	112	846	
520.omnetpp_r	112	344	
523.xalancbmk_r	112	689	
525.x264_r	112	1060	1110
531.deepsjeng_r	112	375	
541.leela_r	112	352	
548.exchange2_r	112	1070	
557.xz_r	112	248	

SPECrate®2017_int_base (513) SPECrate®2017_int_peak (529)

Hardware

CPU Name: Intel Xeon Gold 5520+
 Max MHz: 4000
 Nominal: 2200
Enabled: 56 cores, 2 chips, 2 threads/core
Orderable: 1, 2 chip(s)
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 52.5 MB I+D on chip per chip
 Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-5600B-R, running at 4800)
Storage: 1 x 480 GB SATA SSD
Other: CPU Cooling: Air

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: HPE BIOS Version v2.12 12/13/2023 released Dec-2023
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

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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	112	**453**	**394**	453	394	452	394	112	**420**	**425**	419	425	420	424
502.gcc_r	112	372	427	**371**	**427**	370	429	112	311	509	312	509	**312**	**509**
505.mcf_r	112	**214**	**846**	214	844	214	847	112	**214**	**846**	214	844	214	847
520.omnetpp_r	112	428	343	427	344	**427**	**344**	112	428	343	427	344	**427**	**344**
523.xalancbmk_r	112	**172**	**689**	171	691	172	689	112	**172**	**689**	171	691	172	689
525.x264_r	112	186	1050	186	1060	**186**	**1060**	112	176	1110	176	1110	**176**	**1110**
531.deepsjeng_r	112	342	375	**342**	**375**	342	375	112	342	375	**342**	**375**	342	375
541.leela_r	112	527	352	**527**	**352**	528	352	112	527	352	**527**	**352**	528	352
548.exchange2_r	112	277	1060	273	1080	**273**	**1070**	112	277	1060	273	1080	**273**	**1070**
557.xz_r	112	486	249	**487**	**248**	488	248	112	486	249	**487**	**248**	488	248
SPECrate®2017_int_base =		**513**												
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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"
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>
tuned-adm profile was set to throughput-performance using "tuned-adm profile throughput-performance"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
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
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

```
BIOS Configuration:
 Workload Profile set to General Throughput Compute
 Thermal Configuration set to Maximum Cooling
 Memory Patrol Scrubbing set to Disabled
 Enhanced Processor Performance Profile set to Aggressive
 Intel UPI Link Enablement set to Single Link
 Last Level Cache (LLC) Dead Line Allocation set to Disabled
 Workload Profile set to Custom
  Adjacent Sector Prefetch set to Disabled
  DCU Stream Prefetcher set to Disabled
  Intel UPI Link Power Management set to Enabled


 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Thu Mar 21 21:53:24 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 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. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
 ------------------------------------------------------------


 ------------------------------------------------------------
 1. uname -a
   Linux localhost 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

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

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Platform Notes (Continued)

```
  2. w
     21:53:24 up 1 min,  0 users,  load average: 0.11, 0.04, 0.01
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT

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

  ------------------------------------------------------------
  4. ulimit -a
    core file size          (blocks, -c) unlimited
    data seg size           (kbytes, -d) unlimited
    scheduling priority            (-e) 0
    file size               (blocks, -f) unlimited
    pending signals                (-i) 2062731
    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) 2062731
    virtual memory          (kbytes, -v) unlimited
    file locks                     (-x) unlimited

  ------------------------------------------------------------
  5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 29
   sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
   sshd: root@notty
   bash -c cd $SPEC/ && $SPEC/intrateTP.sh
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 -c
    ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=56 --define physicalfirst
    --define invoke_with_interleave --define drop_caches --tune base,peak -o all intrate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 --configfile
    ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=56 --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/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
  $SPEC = /home/cpu2017

  ------------------------------------------------------------
  6. /proc/cpuinfo
    model name       : INTEL(R) XEON(R) GOLD 5520+
    vendor_id        : GenuineIntel
    cpu family       : 6
    model            : 207
    stepping         : 2
    microcode        : 0x21000200
    bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores        : 28
    siblings         : 56
    2 physical ids (chips)
    112 processors (hardware threads)
    physical id 0: core ids 0-27
    physical id 1: core ids 0-27
    physical id 0: apicids 0-55
```

(Continued on next page)

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Platform Notes (Continued)

```
     physical id 1: apicids 128-183
  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:                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) GOLD 5520+
  CPU family:                   6
  Model:                        207
  Thread(s) per core:           2
  Core(s) per socket:           28
  Socket(s):                    2
  Stepping:                     2
  BogoMIPS:                     4400.00
  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 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 avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts
                                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:                    2.6 MiB (56 instances)
  L1i cache:                    1.8 MiB (56 instances)
  L2 cache:                     112 MiB (56 instances)
  L3 cache:                     105 MiB (2 instances)
  NUMA node(s):                 4
  NUMA node0 CPU(s):            0-13,56-69
  NUMA node1 CPU(s):            14-27,70-83
  NUMA node2 CPU(s):            28-41,84-97
  NUMA node3 CPU(s):            42-55,98-111
  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
```

(Continued on next page)

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Platform Notes (Continued)

```
   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     2.6M   12 Data            1     64        1             64
      L1i       32K     1.8M    8 Instruction     1     64        1             64
      L2         2M     112M   16 Unified         2   2048        1             64
      L3      52.5M     105M   15 Unified         3  57344        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: 0-13,56-69
    node 0 size: 128676 MB
    node 0 free: 127771 MB
    node 1 cpus: 14-27,70-83
    node 1 size: 129016 MB
    node 1 free: 128545 MB
    node 2 cpus: 28-41,84-97
    node 2 size: 129016 MB
    node 2 free: 128602 MB
    node 3 cpus: 42-55,98-111
    node 3 size: 128996 MB
    node 3 free: 128521 MB
    node distances:
    node   0   1   2   3
      0:  10  20  30  30
      1:  20  10  30  30
      2:  30  30  10  20
      3:  30  30  20  10


  ---------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:      528082944 kB


  ---------------------------------------------------------------
  10. who -r
    run-level 3 Mar 21 21:52


  ---------------------------------------------------------------
  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         apparmor auditd cron getty@ irqbalance issue-generator kbdsettings lvm2-monitor postfix
                    purge-kernels rollback sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4
                    wickedd-dhcp6 wickedd-nanny
    enabled-runtime systemd-remount-fs
    disabled        blk-availability boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell
                    grub2-once haveged haveged-switch-root issue-add-ssh-keys kexec-load lunmask
                    rpmconfigcheck serial-getty@ systemd-boot-check-no-failures systemd-network-generator
                    systemd-sysext systemd-time-wait-sync systemd-timesyncd tuned
    indirect        wickedd


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

(Continued on next page)

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Platform Notes (Continued)

```
13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
    root=UUID=4ccef2cd-b32f-4b9b-bff5-7836c4f7ec60
    splash=silent
    resume=/dev/disk/by-uuid/812398c6-312b-4436-8363-5af4d15d5dc3
    mitigations=auto
    quiet
    security=apparmor

    ----------------------------------------------------------------
14. cpupower frequency-info
    analyzing CPU 0:
      Unable to determine current policy
      boost state support:
        Supported: yes
        Active: yes

    ----------------------------------------------------------------
15. tuned-adm active
    Current active profile: throughput-performance

    ----------------------------------------------------------------
16. sysctl
    kernel.numa_balancing          1
    kernel.randomize_va_space      2
    vm.compaction_proactiveness    20
    vm.dirty_background_bytes      0
    vm.dirty_background_ratio      10
    vm.dirty_bytes                 0
    vm.dirty_expire_centisecs      3000
    vm.dirty_ratio                 20
    vm.dirty_writeback_centisecs   500
    vm.dirtytime_expire_seconds    43200
    vm.extfrag_threshold           500
    vm.min_unmapped_ratio          1
    vm.nr_hugepages                0
    vm.nr_hugepages_mempolicy      0
    vm.nr_overcommit_hugepages     0
    vm.swappiness                  10
    vm.watermark_boost_factor      15000
    vm.watermark_scale_factor      10
    vm.zone_reclaim_mode           0

    ----------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage
    defrag         always defer defer+madvise [madvise] never
    enabled        [always] madvise never
    hpage_pmd_size 2097152
    shmem_enabled  always within_size advise [never] deny force

    ----------------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
    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
```

(Continued on next page)

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Platform Notes (Continued)

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

  -----------------------------------------------------------
  20. Disk information
  SPEC is set to: /home/cpu2017
    Filesystem    Type  Size  Used Avail Use% Mounted on
    /dev/sdb3     xfs   381G  131G  250G  35% /home

  -----------------------------------------------------------
  21. /sys/devices/virtual/dmi/id
      Vendor:         HPE
      Product:        ProLiant ML350 Gen11
      Product Family: ProLiant
      Serial:         CNX20800N3

  -----------------------------------------------------------
  22. 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:
      16x Hynix HMCG88AGBRA193N 32 GB 2 rank 5600, configured at 4800


  -----------------------------------------------------------
  23. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:        HPE
    BIOS Version:       2.12
    BIOS Date:          12/13/2023
    BIOS Revision:      2.12
    Firmware Revision: 1.54
```

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.
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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`

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant ML350 Gen11
(2.20 GHz, Intel Xeon Gold 5520+)

SPECrate®2017_int_base = 513

SPECrate®2017_int_peak = 529

CPU2017 License:	3	**Test Date:**	Mar-2024
Test Sponsor:	HPE	**Hardware Availability:**	Feb-2024
Tested by:	HPE	**Software Availability:**	Dec-2023

Base Optimization Flags

C benchmarks:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -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 -xsapphirerapids -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 -xsapphirerapids -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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SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
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ProLiant ML350 Gen11
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SPECrate®2017_int_peak = 529

CPU2017 License: 3
Test Sponsor: HPE
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Test Date: Mar-2024
Hardware Availability: Feb-2024
Software Availability: Dec-2023

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 -xsapphirerapids -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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https://www.spec.org/

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CPU2017 License: 3		**Test Date:**	Mar-2024
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Tested by:	HPE	**Software Availability:**	Dec-2023

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/HPE-Platform-Flags-Intel-EMR-rev1.0.html
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-EMR-rev1.0.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml

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

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