SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

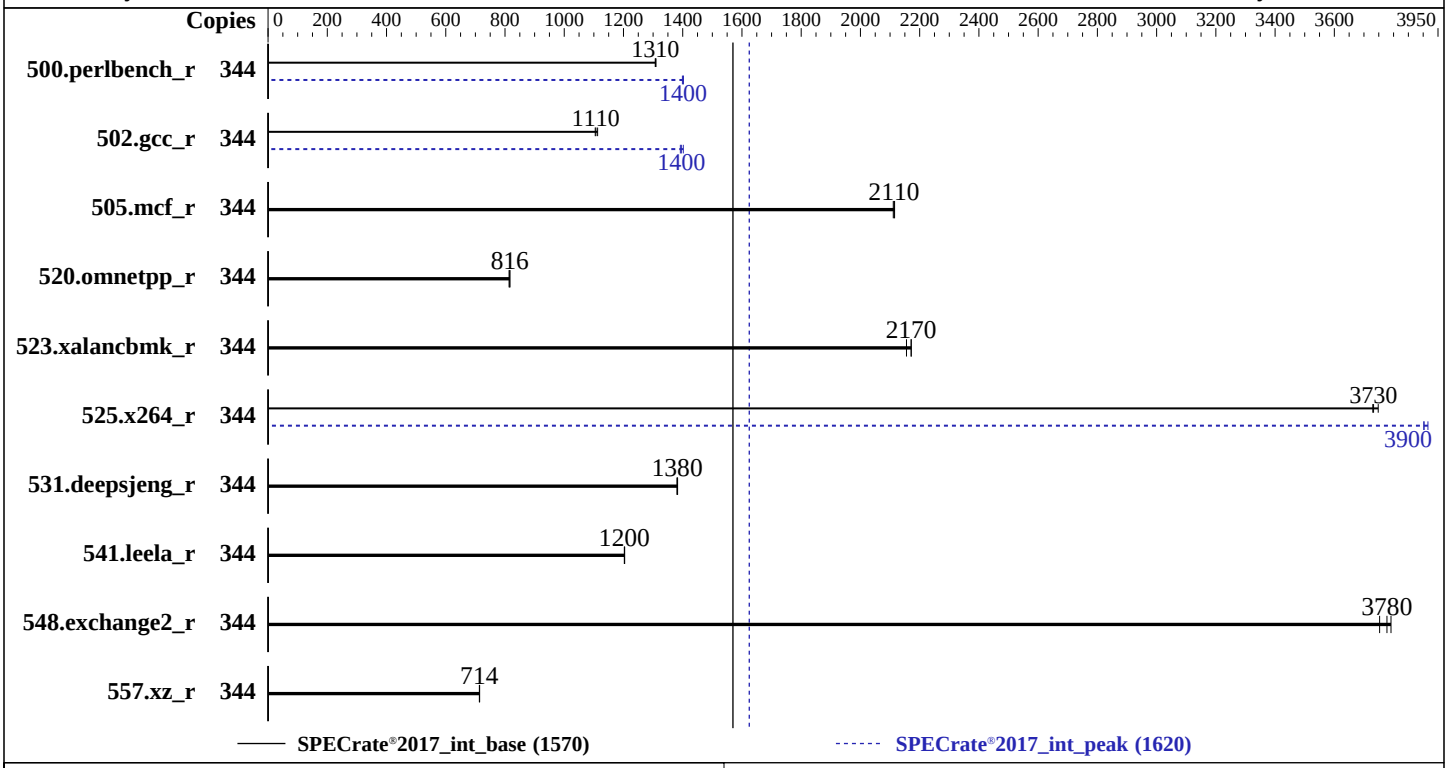
ProLiant DL380 Gen12
(2.00 GHz, Intel Xeon 6787P)

SPECrate®2017_int_base = 1570

SPECrate®2017_int_peak = 1620

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Feb-2025
Hardware Availability: Mar-2025
Software Availability: Jun-2024



Hardware

CPU Name:	Intel Xeon 6787P
Max MHz:	3800
Nominal:	2000
Enabled:	172 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	64 KB I + 48 KB D on chip per core
L2:	2 MB I+D on chip per core
L3:	336 MB I+D on chip per chip
Other:	None
Memory:	512 GB (16 x 32 GB 2Rx8 PC5-6400B-R)
Storage:	1 x 3.2 TB NVMe SSD
Other:	CPU Cooling: Air

Software

OS:	SUSE Linux Enterprise Server 15 SP6 Kernel 6.4.0-150600.21-default
Compiler:	C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;
Parallel:	No
Firmware:	HPE BIOS Version v1.20 02/07/2025 released Feb-2025
File System:	btrfs
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	344	418	1310	419	1310	**419**	**1310**	344	391	1400	**391**	**1400**	391	1400
502.gcc_r	344	**440**	**1110**	441	1100	438	1110	344	347	1400	**349**	**1400**	350	1390
505.mcf_r	344	263	2120	**263**	**2110**	263	2110	344	263	2120	**263**	**2110**	263	2110
520.omnetpp_r	344	555	814	**553**	**816**	553	816	344	555	814	**553**	**816**	553	816
523.xalancbmk_r	344	169	2160	**167**	**2170**	167	2170	344	169	2160	**167**	**2170**	167	2170
525.x264_r	344	161	3750	161	3730	**161**	**3730**	344	154	3900	**154**	**3900**	154	3920
531.deepsjeng_r	344	**285**	**1380**	285	1380	286	1380	344	**285**	**1380**	285	1380	286	1380
541.leela_r	344	474	1200	**473**	**1200**	473	1200	344	474	1200	**473**	**1200**	473	1200
548.exchange2_r	344	240	3750	238	3790	**239**	**3780**	344	240	3750	238	3790	**239**	**3780**
557.xz_r	344	520	714	521	714	**521**	**714**	344	520	714	521	714	**521**	**714**

SPECrate®2017_int_base = 1570

SPECrate®2017_int_peak = 1620

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)

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
Enhanced Processor Performance Profile set to Aggressive
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
Last Level Cache (LLC) Prefetch set to Enabled
Sub-NUMA Clustering (SNC) set to Enabled
XPT Prefetch set to Disabled
Intel UPI Prefetch set to Disabled
Workload Profile set to Custom
 DCU Stream Prefetcher set to Disabled
 Adjacent Sector Prefetch set to Disabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Fri Feb  7 23:42:25 2025

 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 254 (254.10+suse.84.ge8d77af424)
 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 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
   x86_64 x86_64 x86_64 GNU/Linux
```

(Continued on next page)

Platform Notes (Continued)

```
------------------------------------------------------------
2. w
   23:42:25 up 11:43,  6 users,  load average: 71.87, 168.15, 250.61
  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) 2062081
  max locked memory       (kbytes, -l) 8192
  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) 2062081
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize=42
 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
 sshd: root [priv]
 sshd: root@notty
 bash -c cd $SPEC/ && $SPEC/intrate_spr.sh
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=344 -c
   ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=172 --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=344 --configfile
   ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=172 --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/CPU2017.012/templogs/preenv.intrate.012.0.log --lognum 012.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) 6787P
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 173
    stepping        : 1
    microcode       : 0x1000380
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
    cpu cores       : 86
    siblings        : 172
    2 physical ids (chips)
    344 processors (hardware threads)
    physical id 0: core ids 0-42,64-106
```

(Continued on next page)

Platform Notes (Continued)

```
    physical id 1: core ids 0-42,64-106
    physical id 0: apicids 0-85,128-213
    physical id 1: apicids 256-341,384-469
  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 2.39.3:
  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):                               344
  On-line CPU(s) list:                  0-343
  Vendor ID:                            GenuineIntel
  BIOS Vendor ID:                       Intel(R) Corporation
  Model name:                           Intel(R) Xeon(R) 6787P
  BIOS Model name:                      Intel(R) Xeon(R) 6787P  CPU @ 2.0GHz
  BIOS CPU family:                      179
  CPU family:                           6
  Model:                                173
  Thread(s) per core:                   2
  Core(s) per socket:                   86
  Socket(s):                            2
  Stepping:                             1
  BogoMIPS:                             4000.00
  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 intel_ppin cdp_l2
                                        ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow 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 user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida
                                        arat pln pts vnmi 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 ibt amx_bf16 avx512_fp16 amx_tile
                                        amx_int8 flush_l1d arch_capabilities
  Virtualization:                       VT-x
  L1d cache:                            8.1 MiB (172 instances)
  L1i cache:                            10.8 MiB (172 instances)
  L2 cache:                             344 MiB (172 instances)
  L3 cache:                             672 MiB (2 instances)
  NUMA node(s):                         4
  NUMA node0 CPU(s):                    0-42,172-214
  NUMA node1 CPU(s):                    43-85,215-257
  NUMA node2 CPU(s):                    86-128,258-300
  NUMA node3 CPU(s):                    129-171,301-343
  Vulnerability Gather data sampling:   Not affected
  Vulnerability Itlb multihit:          Not affected
  Vulnerability L1tf:                   Not affected
```

(Continued on next page)

Platform Notes (Continued)

```
  Vulnerability Mds:                    Not affected
  Vulnerability Meltdown:               Not affected
  Vulnerability Mmio stale data:        Not affected
  Vulnerability Reg file data sampling: Not affected
  Vulnerability Retbleed:               Not affected
  Vulnerability Spec rstack overflow:   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 / Automatic IBRS; IBPB conditional; RSB filling;
                                        PBRSB-eIBRS Not affected; BHI BHI_DIS_S
  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     8.1M   12 Data            1     64        1             64
     L1i       64K    10.8M   16 Instruction     1     64        1             64
     L2         2M     344M   16 Unified         2   2048        1             64
     L3       336M     672M   16 Unified         3 344064        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: 0-42,172-214
  node 0 size: 128663 MB
  node 0 free: 115033 MB
  node 1 cpus: 43-85,215-257
  node 1 size: 129001 MB
  node 1 free: 116329 MB
  node 2 cpus: 86-128,258-300
  node 2 size: 128963 MB
  node 2 free: 116211 MB
  node 3 cpus: 129-171,301-343
  node 3 size: 128922 MB
  node 3 free: 115176 MB
  node distances:
  node   0   1   2   3
    0:  10  12  21  21
    1:  12  10  21  21
    2:  21  21  10  12
    3:  21  21  12  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       527924176 kB

------------------------------------------------------------
10. who -r
  run-level 3 Feb 7 11:59

------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
  Default Target  Status
  multi-user      running

------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd
```

(Continued on next page)

Platform Notes (Continued)

```
                  bluetooth cron display-manager getty@ irqbalance issue-generator kbdsettings klog
                  lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked
                  wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant
  enabled-runtime systemd-remount-fs
  disabled        NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon autofs
                  autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates
                  chrony-wait chronyd console-getty cups cups-browsed debug-shell dnsmasq ebtables
                  exchange-bmc-os-info firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd
                  issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb openvpn@
                  ostree-remount rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@
                  smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures
                  systemd-confext systemd-network-generator systemd-sysext systemd-time-wait-sync
                  systemd-timesyncd tuned udisks2 update-system-flatpaks upower vncserver@ wpa_supplicant@
  indirect        pcscd saned@ systemd-userdbd wickedd

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
  root=UUID=4461ad3b-5550-46a9-a453-c296e0e04d21
  splash=silent
  resume=/dev/disk/by-uuid/930cc1e7-2c0e-48d3-84ad-33c84ff87515
  mitigations=auto
  quiet
  security=apparmor

------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 226:
    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

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

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Platform Notes (Continued)

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

------------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
  alloc_sleep_millisecs   60000
  defrag                      1
  max_ptes_none             511
  max_ptes_shared           256
  max_ptes_swap              64
  pages_to_scan            4096
  scan_sleep_millisecs    10000

------------------------------------------------------------
19. OS release
  From /etc/*-release /etc/*-version
  os-release SUSE Linux Enterprise Server 15 SP6

------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
  Filesystem     Type   Size  Used Avail Use% Mounted on
  /dev/sda3      btrfs  1.9T  785G  1.2T  41% /home

------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         HPE
    Product:        HPE ProLiant Compute DL380 Gen12
    Product Family: ProLiant
    Serial:         CNXD1M02CD

------------------------------------------------------------
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 Micron MTC20F2085S1RC64BD2 QSFF 32 GB 2 rank 6400


------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       HPE
   BIOS Version:      1.20
   BIOS Date:         02/07/2025
   BIOS Revision:     1.20
   Firmware Revision: 1.10
```

Compiler Version Notes

```
==============================================================================================================
C       | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.1.0 Build 20240308
```

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Compiler Version Notes (Continued)

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

==============================================================================================================
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 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------------------------

==============================================================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 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)
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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------------------------------------------------------------------------------------------------------------------------

==============================================================================================================
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 2024.1.0 Build 20240308
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------------------------------------------------------------------------------------------------------------------------

==============================================================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 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`

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/opt/intel/oneapi/compiler/2024.1/lib -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/opt/intel/oneapi/compiler/2024.1/lib -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/opt/intel/oneapi/compiler/2024.1/lib -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
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/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc

502.gcc_r: -m32 -L/opt/intel/oneapi/compiler/2024.1/lib32 -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/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

(Continued on next page)

Peak Optimization Flags (Continued)

523.xalancbmk_r: `basepeak = yes`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

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-GNR-rev1.1.html`
`http://www.spec.org/cpu2017/flags/Intel-ic2024-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-GNR-rev1.1.xml`
`http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml`

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

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