SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)
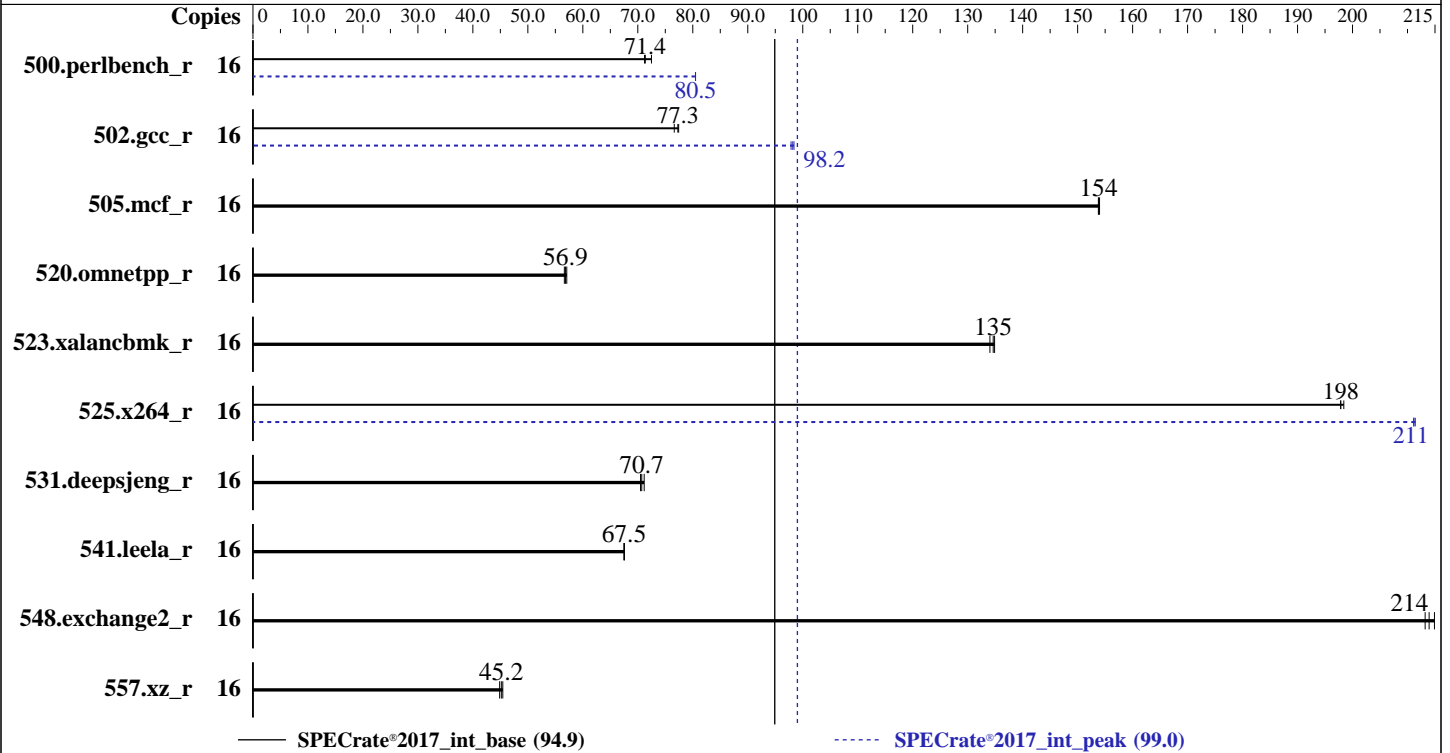
ProLiant MicroServer Gen11
(2.70 GHz, Intel Xeon 6353P)

$SPECrate^{®}2017\_int\_base = 94.9$

$SPECrate^{®}2017\_int\_peak = 99.0$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Feb-2025

Hardware Availability: Mar-2025

Software Availability: Apr-2024

Benchmark	Copies	Base	Peak
500.perlbench_r	16	71.4	80.5
502.gcc_r	16	77.3	98.2
505.mcf_r	16	154	
520.omnetpp_r	16	56.9	
523.xalancbmk_r	16	135	
525.x264_r	16	198	211
531.deepsjeng_r	16	70.7	
541.leela_r	16	67.5	
548.exchange2_r	16	214	
557.xz_r	16	45.2	

SPECrate®2017_int_base (94.9)   SPECrate®2017_int_peak (99.0)

Hardware

CPU Name: Intel Xeon 6353P
 Max MHz: 5400
 Nominal: 2700
 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 PC5-5600B-E, running at 4400 , orderable using HPE part# P64339-B21)
 Storage: 1 x 1 TB 7.2 K SATA HDD
 Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.4 (Plow)
 Kernel 5.14.0-427.13.1.el9_4.x86_64
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 v2.10 12/06/2024 released Dec-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 set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
500.perlbench_r	16	351	72.5	**357**	**71.4**	358	71.2	16	316	80.5	**316**	**80.5**	316	80.5
502.gcc_r	16	296	76.6	293	77.4	**293**	**77.3**	16	**231**	**98.2**	230	98.4	231	97.9
505.mcf_r	16	168	154	168	154	**168**	**154**	16	168	154	168	154	**168**	**154**
520.omnetpp_r	16	**369**	**56.9**	371	56.6	368	57.1	16	**369**	**56.9**	371	56.6	368	57.1
523.xalancbmk_r	16	**125**	**135**	125	135	126	134	16	**125**	**135**	125	135	126	134
525.x264_r	16	141	198	**142**	**198**	142	198	16	133	211	133	211	**133**	**211**
531.deepsjeng_r	16	260	70.5	**259**	**70.7**	258	71.2	16	260	70.5	**259**	**70.7**	258	71.2
541.leela_r	16	**392**	**67.5**	393	67.5	392	67.6	16	**392**	**67.5**	393	67.5	392	67.6
548.exchange2_r	16	197	213	195	215	**196**	**214**	16	197	213	195	215	**196**	**214**
557.xz_r	16	**382**	**45.2**	385	44.9	380	45.4	16	**382**	**45.2**	385	44.9	380	45.4
SPECrate®2017_int_base =		**94.9**												
SPECrate®2017_int_peak =								**99.0**						

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/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)
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
```

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Platform Notes

```
 BIOS Configuration:
  Workload Profile set to General Throughput Compute
  Thermal Configuration set to Maximum Cooling
  Enhanced Processor Performance Profile set to Enabled

  Sysinfo program /home/cpu2017/bin/sysinfo
  Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
  running on localhost.localdomain Mon Feb 24 05:28:50 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 252 (252-32.el9_4)
  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 5.14.0-427.13.1.el9_4.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 10 10:29:16 EDT
    2024 x86_64 x86_64 x86_64 GNU/Linux


  ------------------------------------------------------------
  2. w
     05:28:50 up 2 min,  1 user,  load average: 0.23, 0.14, 0.06
    USER     TTY          LOGIN@   IDLE   JCPU   PCPU WHAT
    root     pts/0     05:27    9.00s  0.64s  0.00s -bash


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

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Platform Notes (Continued)

```
  file size                (blocks, -f) unlimited
  pending signals                 (-i) 256639
  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) 256639
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited


  -------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 31
 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
 sshd: root [priv]
 sshd: root@pts/0
 -bash
 -bash
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 -c
   ic2024.1-lin-core-avx2-rate-20240308.cfg --define smt-on --define cores=8 --define physicalfirst --define
   no-numa --tune base,peak -o all --define drop_caches intrate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 --configfile
   ic2024.1-lin-core-avx2-rate-20240308.cfg --define smt-on --define cores=8 --define physicalfirst --define
   no-numa --tune base,peak --output_format all --define drop_caches --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) 6353P
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 183
    stepping        : 1
    microcode       : 0x12c
    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:           46 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
   BIOS Vendor ID:                   Intel(R) Corporation
   Model name:                       Intel(R) Xeon(R) 6353P
   BIOS Model name:                  Intel(R) Xeon(R) 6353P
   CPU family:                       6
   Model:                            183
   Thread(s) per core:               2
   Core(s) per socket:               8
   Socket(s):                        1
   Stepping:                         1
   BogoMIPS:                         5376.00
   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
                                     sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
                                     rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb ssbd ibrs ibpb stibp
                                     ibrs_enhanced tpr_shadow 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 vnmi umip pku ospke waitpkg gfni
                                     vaes vpclmulqdq tme rdpid movdiri movdir64b fsrm md_clear serialize
                                     pconfig arch_lbr ibt 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 Gather data sampling: Not affected
   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 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 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: 64201 MB
```

(Continued on next page)

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Platform Notes (Continued)

```
   node 0 free: 63574 MB
   node distances:
   node   0
     0:  10


      -------------------------------------------------------------
   9. /proc/meminfo
      MemTotal:       65742624 kB


      -------------------------------------------------------------
   10. who -r
      run-level 3 Feb 24 05:28


      -------------------------------------------------------------
   11. Systemd service manager version: systemd 252 (252-32.el9_4)
      Default Target  Status
      multi-user      degraded


      -------------------------------------------------------------
   12. Failed units, from systemctl list-units --state=failed
        UNIT                            LOAD   ACTIVE SUB    DESCRIPTION
      * NetworkManager-wait-online.service loaded failed failed Network Manager Wait Online


      -------------------------------------------------------------
   13. Services, from systemctl list-unit-files
        STATE           UNIT FILES
        enabled         NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd crond
                        dbus-broker firewalld getty@ insights-client-boot irqbalance kdump lvm2-monitor mdmonitor
                        microcode nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd
                        systemd-boot-update systemd-network-generator udisks2
        enabled-runtime systemd-remount-fs
        disabled        blk-availability console-getty cpupower debug-shell dnf-system-upgrade hwloc-dump-hwdata
                        kvm_stat man-db-restart-cache-update nftables rdisc rhcd rhsm rhsm-facts rpmdb-rebuild
                        selinux-check-proper-disable 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 systemd-sysupdate
                        systemd-sysupdate-reboot


      -------------------------------------------------------------
   14. Linux kernel boot-time arguments, from /proc/cmdline
      BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-427.13.1.el9_4.x86_64
      root=/dev/mapper/rhel00-root
      ro
      resume=/dev/mapper/rhel00-swap
      rd.lvm.lv=rhel00/root
      rd.lvm.lv=rhel00/swap


      -------------------------------------------------------------
   15. cpupower frequency-info
      analyzing CPU 11:
        Unable to determine current policy
        boost state support:
          Supported: yes
          Active: yes


      -------------------------------------------------------------
   16. sysctl
      kernel.numa_balancing             0
      kernel.randomize_va_space         2
      vm.compaction_proactiveness       20
```

(Continued on next page)

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Platform Notes (Continued)

```
  vm.dirty_background_bytes              0
  vm.dirty_background_ratio             10
  vm.dirty_bytes                         0
  vm.dirty_expire_centisecs           3000
  vm.dirty_ratio                        20
  vm.dirty_writeback_centisecs         500
  vm.dirtytime_expire_seconds        43200
  vm.extfrag_threshold                 500
  vm.min_unmapped_ratio                  1
  vm.nr_hugepages                        0
  vm.nr_hugepages_mempolicy              0
  vm.nr_overcommit_hugepages             0
  vm.swappiness                         60
  vm.watermark_boost_factor          15000
  vm.watermark_scale_factor             10
  vm.zone_reclaim_mode                   0


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


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


  ---------------------------------------------------------------
19. OS release
  From /etc/*-release /etc/*-version
  os-release     Red Hat Enterprise Linux 9.4 (Plow)
  redhat-release Red Hat Enterprise Linux release 9.4 (Plow)
  system-release Red Hat Enterprise Linux release 9.4 (Plow)


  ---------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
  Filesystem            Type  Size  Used Avail Use% Mounted on
  /dev/mapper/rhel00-home xfs   829G   62G  767G   8% /home


  ---------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         HPE
    Product:        ProLiant MicroServer Gen11
    Product Family: ProLiant
    Serial:         91ZV86L0HM


  ---------------------------------------------------------------
22. dmidecode
  Additional information from dmidecode 3.5 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.
```

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Platform Notes (Continued)

```
    Memory:
      2x Hynix HMCG88AGBEA084N 32 GB 2 rank 5600, configured at 4400


    ------------------------------------------------------------
    23. BIOS
    (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:       HPE
      BIOS Version:      2.10
      BIOS Date:         12/06/2024
      BIOS Revision:     2.10
      Firmware Revision: 1.67
```

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


==============================================================================
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.
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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 -xCORE-AVX2 -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 -xCORE-AVX2 -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 -xCORE-AVX2 -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`

SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant MicroServer Gen11
(2.70 GHz, Intel Xeon 6353P)

SPECrate®2017_int_base = 94.9

SPECrate®2017_int_peak = 99.0

CPU2017 License:	3	**Test Date:**	Feb-2025
Test Sponsor:	HPE	**Hardware Availability:**	Mar-2025
Tested by:	HPE	**Software Availability:**	Apr-2024

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 -flto`
`-Ofast -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 -flto`
`-Ofast -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

(Continued on next page)

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Peak Optimization Flags (Continued)

525.x264_r: `-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX2 -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`

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-CatlowRefresh-rev1.0.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-CatlowRefresh-rev1.0.xml`
`http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml`

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

Tested with SPEC CPU®2017 v1.1.9 on 2025-02-23 18:58:49-0500.
Report generated on 2025-03-26 10:34:47 by CPU2017 PDF formatter v6716.
Originally published on 2025-03-25.