SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant MicroServer Gen11
(2.90 Ghz, Intel Xeon E-2436)

$SPECrate®2017\_int\_base = 74.9$
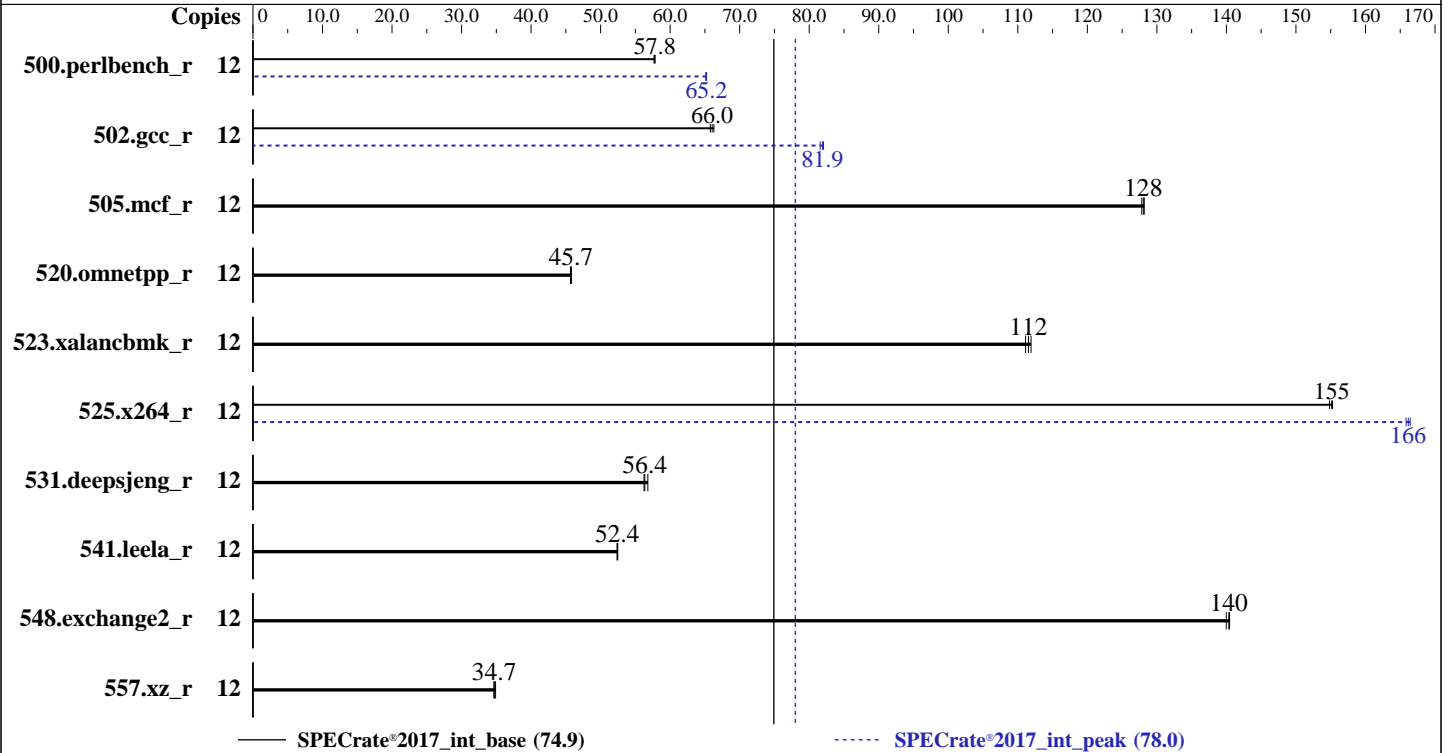
$SPECrate®2017\_int\_peak = 78.0$

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

Chart — Copies = 12 for all benchmarks.

Benchmark	Copies	base	peak
500.perlbench_r	12	57.8	65.2
502.gcc_r	12	66.0	81.9
505.mcf_r	12	128	
520.omnetpp_r	12	45.7	
523.xalancbmk_r	12	112	
525.x264_r	12	155	166
531.deepsjeng_r	12	56.4	
541.leela_r	12	52.4	
548.exchange2_r	12	140	
557.xz_r	12	34.7	

SPECrate®2017_int_base (74.9)   SPECrate®2017_int_peak (78.0)

Hardware

CPU Name: Intel Xeon E-2436
Max MHz: 5000
Nominal: 2900
Enabled: 6 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: 18 MB I+D on chip per chip
Other: None
Memory: 64 GB (2 x 32 GB 2Rx8 PC5-5600B-R, 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 9.2 (Plow)
Kernel 5.14.0-284.11.1.el9_2.x86_64
Compiler: C/C++: Version 2024.0.2 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2024.0.2 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: HPE BIOS Version v1.48 03/14/2024 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 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	12	**331**	**57.8**	331	57.7	330	57.8	12	293	65.2	293	65.1	**293**	**65.2**
502.gcc_r	12	256	66.3	**257**	**66.0**	258	65.8	12	207	82.1	**207**	**81.9**	208	81.6
505.mcf_r	12	**151**	**128**	151	128	152	128	12	**151**	**128**	151	128	152	128
520.omnetpp_r	12	345	45.7	**344**	**45.7**	344	45.8	12	345	45.7	**344**	**45.7**	344	45.8
523.xalancbmk_r	12	114	111	113	112	**114**	**112**	12	114	111	113	112	**114**	**112**
525.x264_r	12	135	155	136	155	**135**	**155**	12	**126**	**166**	126	166	127	166
531.deepsjeng_r	12	244	56.2	242	56.8	**244**	**56.4**	12	244	56.2	242	56.8	**244**	**56.4**
541.leela_r	12	**379**	**52.4**	379	52.5	379	52.4	12	**379**	**52.4**	379	52.5	379	52.4
548.exchange2_r	12	225	140	**224**	**140**	224	140	12	225	140	**224**	**140**	224	140
557.xz_r	12	374	34.7	371	34.9	**373**	**34.7**	12	374	34.7	371	34.9	**373**	**34.7**
SPECrate®2017_int_base =		**74.9**											
SPECrate®2017_int_peak =		**78.0**											

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
```

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 Wed Apr 10 10:04:02 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 252 (252-13.el9_2)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
 16. /sys/kernel/mm/transparent_hugepage
 17. /sys/kernel/mm/transparent_hugepage/khugepaged
 18. OS release
 19. Disk information
 20. /sys/devices/virtual/dmi/id
 21. dmidecode
 22. BIOS
 -------------------------------------------------------------


 -------------------------------------------------------------
 1. uname -a
   Linux localhost.localdomain 5.14.0-284.11.1.el9_2.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 12 10:45:03 EDT
   2023 x86_64 x86_64 x86_64 GNU/Linux


 -------------------------------------------------------------
 2. w
    10:04:02 up 1 min,  0 users,  load average: 0.18, 0.09, 0.03
   USER     TTY       LOGIN@   IDLE   JCPU   PCPU WHAT


 -------------------------------------------------------------
 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) 256671
```

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Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2024

Hardware Availability: Jun-2024

Software Availability: Dec-2023

Platform Notes (Continued)

```
  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) 256671
  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@notty
 bash -c cd $SPEC/ && $SPEC/intrate.sh
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=12 -c
   ic2024.0.2-lin-core-avx2-rate-20231213.cfg --define smt-on --define cores=6 --define physicalfirst
   --define no-numa --tune base,peak -o all --define drop_caches intrate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=12 --configfile
   ic2024.0.2-lin-core-avx2-rate-20231213.cfg --define smt-on --define cores=6 --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) E E-2436
   vendor_id        : GenuineIntel
   cpu family       : 6
   model            : 183
   stepping         : 1
   microcode        : 0x121
   bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
   cpu cores        : 6
   siblings         : 12
   1 physical ids (chips)
   12 processors (hardware threads)
   physical id 0: core ids 0-5
   physical id 0: apicids 0-11
  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):                    12
   On-line CPU(s) list:       0-11
   Vendor ID:                 GenuineIntel
   BIOS Vendor ID:            Intel(R) Corporation
```

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

Platform Notes (Continued)

```
Model name:                     Intel(R) Xeon(R) E E-2436
BIOS Model name:                Intel(R) Xeon(R) E E-2436
CPU family:                     6
Model:                          183
Thread(s) per core:             2
Core(s) per socket:             6
Socket(s):                      1
Stepping:                       1
BogoMIPS:                       5836.80
Flags:                          fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                                clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                                lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                                nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                                ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2
                                x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm
                                abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd ibrs ibpb stibp
                                ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase
                                tsc_adjust bmi1 avx2 smep bmi2 erms invpcid rdseed adx smap clflushopt
                                clwb intel_pt sha_ni xsaveopt xsavec xgetbv1 xsaves split_lock_detect
                                avx_vnni dtherm ida arat pln pts hfi umip pku ospke waitpkg gfni vaes
                                vpclmulqdq tme rdpid movdiri movdir64b fsrm md_clear serialize pconfig
                                arch_lbr ibt flush_l1d arch_capabilities
Virtualization:                 VT-x
L1d cache:                      288 KiB (6 instances)
L1i cache:                      192 KiB (6 instances)
L2 cache:                       12 MiB (6 instances)
L3 cache:                       18 MiB (1 instance)
NUMA node(s):                   1
NUMA node0 CPU(s):              0-11
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
Vulnerability Spectre v1:       Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:       Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSB-eIBRS SW
                                sequence
Vulnerability Srbds:            Not affected
Vulnerability Tsx async abort:  Not affected

From lscpu --cache:
    NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL  SETS PHY-LINE COHERENCY-SIZE
    L1d      48K     288K   12 Data           1     64      1           64
    L1i      32K     192K    8 Instruction    1     64      1           64
    L2        2M      12M   16 Unified        2   2048      1           64
    L3       18M      18M    9 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: 0-11
  node 0 size: 64209 MB
  node 0 free: 63567 MB
  node distances:
  node   0
    0:  10
```

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Platform Notes (Continued)

```
-----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       65750788 kB


-----------------------------------------------------------
10. who -r
   run-level 3 Apr 10 10:02


-----------------------------------------------------------
11. Systemd service manager version: systemd 252 (252-13.el9_2)
   Default Target  Status
   multi-user      running


-----------------------------------------------------------
12. 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 chrony-wait chronyd 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


-----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-284.11.1.el9_2.x86_64
   root=/dev/mapper/rhel-root
   ro
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root
   rd.lvm.lv=rhel/swap


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


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

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Platform Notes (Continued)

```
  vm.nr_hugepages_mempolicy          0
  vm.nr_overcommit_hugepages         0
  vm.swappiness                     60
  vm.watermark_boost_factor      15000
  vm.watermark_scale_factor         10
  vm.zone_reclaim_mode               0


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


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


  ----------------------------------------------------------------
18. OS release
  From /etc/*-release /etc/*-version
  os-release     Red Hat Enterprise Linux 9.2 (Plow)
  redhat-release Red Hat Enterprise Linux release 9.2 (Plow)
  system-release Red Hat Enterprise Linux release 9.2 (Plow)


  ----------------------------------------------------------------
19. Disk information
SPEC is set to: /home/CPU2017
  Filesystem            Type  Size  Used Avail Use% Mounted on
  /dev/mapper/rhel-home xfs   829G   65G  764G   8% /home


  ----------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
  Vendor:         HPE
  Product:        ProLiant MicroServer Gen11
  Product Family: ProLiant
  Serial:         JRT31JQXTD


  ----------------------------------------------------------------
21. 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:
    2x Hynix HMCG88AGBEA084N 32 GB 2 rank 5600, configured at 4400


  ----------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
  BIOS Vendor:      HPE
  BIOS Version:     1.48
  BIOS Date:        03/14/2024
```

(Continued on next page)

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Platform Notes (Continued)

```
    BIOS Revision:    1.48
    Firmware Revision: 1.56
```

Compiler Version Notes

```
==============================================================================
C        | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.0.2 Build 20231213
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 2024.0.2 Build 20231213
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 2024.0.2 Build 20231213
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------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
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------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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 2024.0.2 Build 20231213
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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:

icx

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

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Base Compiler Invocation (Continued)

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/2024.0/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/2024.0/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/2024.0/lib -lqkmalloc`

SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant MicroServer Gen11
(2.90 Ghz, Intel Xeon E-2436)

SPECrate®2017_int_base = 74.9

SPECrate®2017_int_peak = 78.0

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2024

Hardware Availability: Jun-2024

Software Availability: Dec-2023

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/2024.0/lib -lqkmalloc`

502.gcc_r: `-m32 -L/opt/intel/oneapi/compiler/2024.0/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)

Hewlett Packard Enterprise
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ProLiant MicroServer Gen11
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SPECrate®2017_int_base = 74.9

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

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/2024.0/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-RPL-rev2.0.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-RPL-rev2.0.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 2024-04-10 00:34:02-0400.
Report generated on 2024-05-21 19:23:20 by CPU2017 PDF formatter v6716.
Originally published on 2024-05-21.