# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

$SPECrate^{®}2017\_int\_base = 822$

### PowerEdge R760 (Intel Xeon Max 9470)

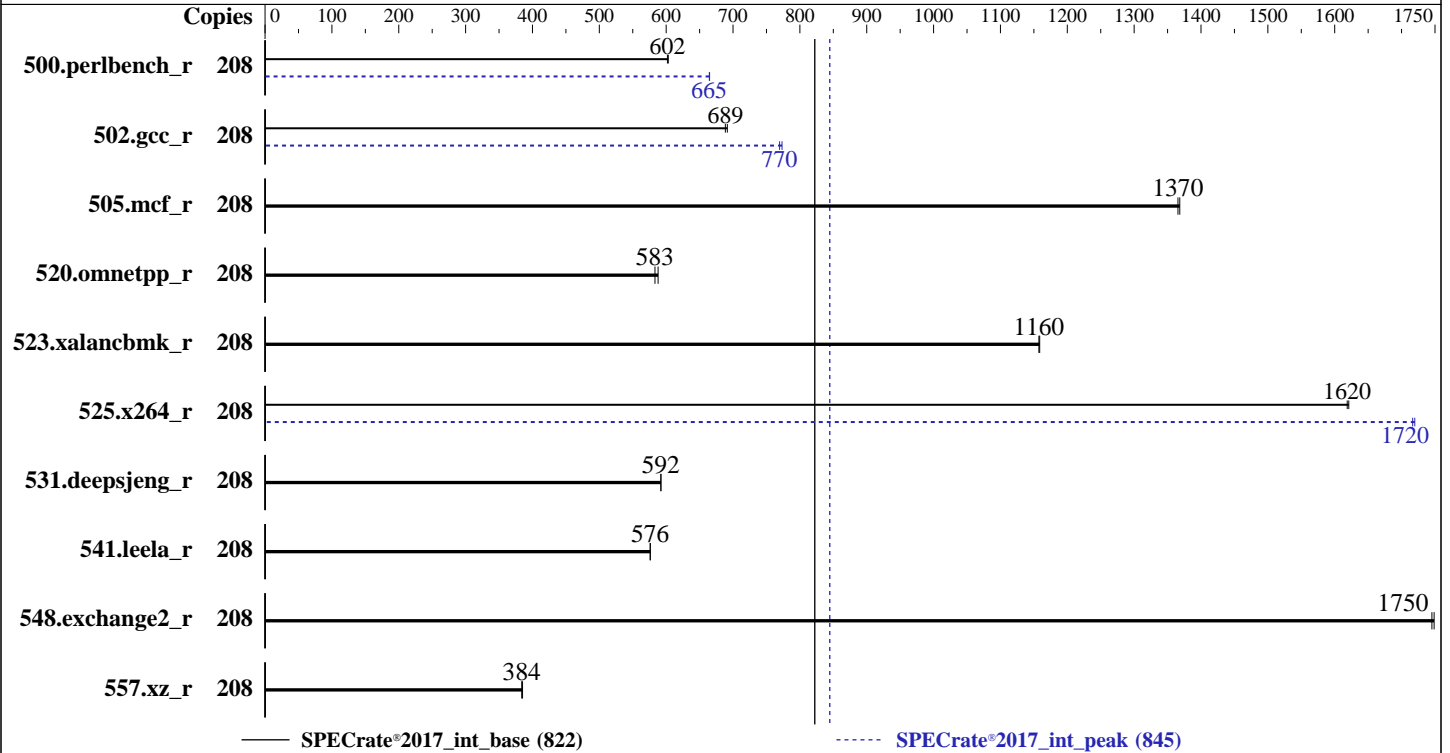$SPECrate^{®}2017\_int\_peak = 845$

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

| Benchmark | Copies | Base | Peak |
|---|---|---|---|
| 500.perlbench_r | 208 | 602 | 665 |
| 502.gcc_r | 208 | 689 | 770 |
| 505.mcf_r | 208 | 1370 | |
| 520.omnetpp_r | 208 | 583 | |
| 523.xalancbmk_r | 208 | 1160 | |
| 525.x264_r | 208 | 1620 | 1720 |
| 531.deepsjeng_r | 208 | 592 | |
| 541.leela_r | 208 | 576 | |
| 548.exchange2_r | 208 | 1750 | |
| 557.xz_r | 208 | 384 | |

SPECrate®2017_int_base (822)          SPECrate®2017_int_peak (845)

## Hardware

CPU Name: Intel Xeon Max 9470
 Max MHz: 3500
 Nominal: 2000
Enabled: 104 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 105 MB I+D on chip per chip
 Other: None
Memory: 1152 GB (16 x 64 GB 2Rx4 PC5-4800B-R + 8 x 16 GB HBM)
Storage: 120 GB on tmpfs
Other: CPU Cooling: DLC

## Software

OS: SUSE Linux Enterprise Server 15 SP4
5.14.21-150400.24.81-default
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: Version 2.1.3 released Jan-2024
File System: tmpfs
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.

# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

### PowerEdge R760 (Intel Xeon Max 9470)

SPECrate®2017_int_base = 822

SPECrate®2017_int_peak = 845

**CPU2017 License:** 6573

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Mar-2024

**Hardware Availability:** May-2023

**Software Availability:** Dec-2023

## 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 | 208 | 549 | 603 | **550** | **602** | | | 208 | 498 | 665 | **498** | **665** | | |
| 502.gcc_r | 208 | 426 | 691 | **428** | **689** | | | 208 | **383** | **770** | 381 | 773 | | |
| 505.mcf_r | 208 | 246 | 1370 | **246** | **1370** | | | 208 | 246 | 1370 | **246** | **1370** | | |
| 520.omnetpp_r | 208 | 464 | 588 | **468** | **583** | | | 208 | 464 | 588 | **468** | **583** | | |
| 523.xalancbmk_r | 208 | 190 | 1160 | **190** | **1160** | | | 208 | 190 | 1160 | **190** | **1160** | | |
| 525.x264_r | 208 | **225** | **1620** | 225 | 1620 | | | 208 | 212 | 1720 | **212** | **1720** | | |
| 531.deepsjeng_r | 208 | 403 | 592 | **403** | **592** | | | 208 | 403 | 592 | **403** | **592** | | |
| 541.leela_r | 208 | 598 | 576 | **598** | **576** | | | 208 | 598 | 576 | **598** | **576** | | |
| 548.exchange2_r | 208 | 312 | 1750 | **312** | **1750** | | | 208 | 312 | 1750 | **312** | **1750** | | |
| 557.xz_r | 208 | 583 | 385 | **585** | **384** | | | 208 | 583 | 385 | **585** | **384** | | |

SPECrate®2017_int_base = **822**

SPECrate®2017_int_peak = **845**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

## Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

## Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
    "/mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2/lib/ia32:/mnt
    /ramdisk/cpu2017-1.1.9-ic2024.0.2/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
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>
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
```

**(Continued on next page)**

# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

$SPECrate^{®}2017\_int\_base = 822$

$SPECrate^{®}2017\_int\_peak = 845$

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## General Notes (Continued)

```
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.

Benchmark run from a 120 GB ramdisk created with the cmd: "mount -t tmpfs -o size=120G tmpfs /mnt/ramdisk"
```

## Platform Notes

```
BIOS settings:
                ADDDC Setting : Disabled
        DIMM Self Healing on
   Uncorrectable Memory Error : Disabled
                     HBM Mode : Cache

     Virtualization Technology : Disabled
       DCU Streamer Prefetcher : Disabled
              Sub NUMA Cluster : 4-way Clustering
                   LLC Prefetch : Disabled
          Dead Line LLC Alloc : Disabled
               Optimizer Mode : Enabled

               System Profile : Custom
        CPU Power Management : Maximum Performance
                         C1E : Disabled
                     C States : Autonomous
           Memory Patrol Scrub : Disabled
     Energy Efficiency Policy : Performance
            PCI ASPM L1 Link
               Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on sut Fri Mar 22 07:51:54 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.195.gb473c02cc0)
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. tuned-adm active
```

*(Continued on next page)*

## Dell Inc.

SPECrate®2017_int_base = 822

PowerEdge R760 (Intel Xeon Max 9470)

SPECrate®2017_int_peak = 845

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## Platform Notes (Continued)

```
  17. sysctl
  18. /sys/kernel/mm/transparent_hugepage
  19. /sys/kernel/mm/transparent_hugepage/khugepaged
  20. OS release
  21. Disk information
  22. /sys/devices/virtual/dmi/id
  23. dmidecode
  24. BIOS
  -----------------------------------------------------------


  -----------------------------------------------------------
  1. uname -a
    Linux sut 5.14.21-150400.24.81-default #1 SMP PREEMPT_DYNAMIC Tue Aug 8 14:10:43 UTC 2023 (90a74a8) x86_64
    x86_64 x86_64 GNU/Linux


  -----------------------------------------------------------
  2. w
     07:51:54 up 10 min,  1 user,  load average: 0.30, 0.15, 0.11
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root     tty1     -                07:50   34.00s  1.77s  0.00s /bin/bash
    /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define
    DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt --define
    DL-LQC=1


  -----------------------------------------------------------
  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) 4125869
    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) 4125869
    virtual memory          (kbytes, -v) unlimited
    file locks                      (-x) unlimited


  -----------------------------------------------------------
  5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 30
   login -- root
   -bash
   /bin/bash ./DELL_rate.sh
   /bin/bash /home/DellFiles/bin/dell-run-main.sh rate
   /bin/bash /home/DellFiles/bin/dell-run-main.sh rate
   /bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc
     --define DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt
     --define DL-LQC=1
   /bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc
     --define DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt
```

# SPEC CPU®2017 Integer Rate Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

SPECrate®2017_int_base = 822

SPECrate®2017_int_peak = 845

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## Platform Notes (Continued)

```
      --define DL-LQC=1
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=208 -c
     ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=104 --define physicalfirst
     --define invoke_with_interleave --define drop_caches --tune base,peak -o all --define DL-BIOS-SNC=4
     --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1 --define
     DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt --define DL-LQC=1 intrate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=208 --configfile
     ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=104 --define physicalfirst
     --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --define
     DL-BIOS-SNC=4 --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1 --define
     DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt --define DL-LQC=1 --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 = /mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2

    ----------------------------------------------------------
  6. /proc/cpuinfo
      model name      : Intel (R) Xeon (R) CPU Max 9470
      vendor_id       : GenuineIntel
      cpu family      : 6
      model           : 143
      stepping        : 8
      microcode       : 0x2c000351
      bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
      cpu cores       : 52
      siblings        : 104
      2 physical ids (chips)
      208 processors (hardware threads)
      physical id 0: core ids 0-51
      physical id 1: core ids 0-51
      physical id 0: apicids 0-103
      physical id 1: apicids 128-231
   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 2.37.2:
    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):                  208
    On-line CPU(s) list:     0-207
    Vendor ID:               GenuineIntel
    Model name:              Intel (R) Xeon (R) CPU Max 9470
    CPU family:              6
    Model:                   143
    Thread(s) per core:      2
    Core(s) per socket:      52
    Socket(s):               2
    Stepping:                8
    CPU max MHz:             3500.0000
    CPU min MHz:             800.0000
    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
```

**(Continued on next page)**

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

SPECrate®2017_int_base = 822

SPECrate®2017_int_peak = 845

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## Platform Notes (Continued)

```
                      xtopology nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq
                      dtes64 monitor ds_cpl 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
                      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
                      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
  L1d cache:          4.9 MiB (104 instances)
  L1i cache:          3.3 MiB (104 instances)
  L2 cache:           208 MiB (104 instances)
  L3 cache:           210 MiB (2 instances)
  NUMA node(s):       8
  NUMA node0 CPU(s):  0-12,104-116
  NUMA node1 CPU(s):  13-25,117-129
  NUMA node2 CPU(s):  26-38,130-142
  NUMA node3 CPU(s):  39-51,143-155
  NUMA node4 CPU(s):  52-64,156-168
  NUMA node5 CPU(s):  65-77,169-181
  NUMA node6 CPU(s):  78-90,182-194
  NUMA node7 CPU(s):  91-103,195-207
  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 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
  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     4.9M   12 Data           1      64      1            64
      L1i       32K     3.3M    8 Instruction    1      64      1            64
      L2         2M     208M   16 Unified        2    2048      1            64
      L3       105M     210M   15 Unified        3  114688      1            64

  -----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0-12,104-116
    node 0 size: 128469 MB
    node 0 free: 128108 MB
    node 1 cpus: 13-25,117-129
    node 1 size: 128971 MB
    node 1 free: 128616 MB
    node 2 cpus: 26-38,130-142
```

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

SPECrate®2017_int_base = 822

SPECrate®2017_int_peak = 845

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## Platform Notes (Continued)

```
   node 2 size: 129017 MB
   node 2 free: 128694 MB
   node 3 cpus: 39-51,143-155
   node 3 size: 129017 MB
   node 3 free: 128705 MB
   node 4 cpus: 52-64,156-168
   node 4 size: 129017 MB
   node 4 free: 128702 MB
   node 5 cpus: 65-77,169-181
   node 5 size: 129017 MB
   node 5 free: 128697 MB
   node 6 cpus: 78-90,182-194
   node 6 size: 129017 MB
   node 6 free: 116624 MB
   node 7 cpus: 91-103,195-207
   node 7 size: 128969 MB
   node 7 free: 128542 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  17  17  17  26  26  26  26
     1:  17  10  17  17  26  26  26  26
     2:  17  17  10  17  26  26  26  26
     3:  17  17  17  10  26  26  26  26
     4:  26  26  26  26  10  17  17  17
     5:  26  26  26  26  17  10  17  17
     6:  26  26  26  26  17  17  10  17
     7:  26  26  26  26  17  17  17  10


   ------------------------------------------------------------
   9. /proc/meminfo
     MemTotal:      1056252520 kB


   ------------------------------------------------------------
   10. who -r
     run-level 3 Mar 22 07:42


   ------------------------------------------------------------
   11. Systemd service manager version: systemd 249 (249.16+suse.195.gb473c02cc0)
     Default Target  Status
     multi-user      degraded


   ------------------------------------------------------------
   12. Failed units, from systemctl list-units --state=failed
      UNIT            LOAD    ACTIVE SUB    DESCRIPTION
    * postfix.service loaded failed failed Postfix Mail Transport Agent
    * smartd.service  loaded failed failed Self Monitoring and Reporting Technology (SMART) Daemon


   ------------------------------------------------------------
   13. Services, from systemctl list-unit-files
     STATE           UNIT FILES
     enabled         ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                     YaST2-Firstboot YaST2-Second-Stage auditd bluetooth cron display-manager getty@ haveged
                     irqbalance iscsi issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels
                     rollback rsyslog smartd sshd systemd-pstore tuned wpa_supplicant
     enabled-runtime systemd-remount-fs
     disabled        accounts-daemon apparmor appstream-sync-cache autofs autoyast-initscripts blk-availability
                     bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd console-getty cups
                     cups-browsed debug-shell dmraid-activation dnsmasq ebtables exchange-bmc-os-info
                     fancontrol firewalld gpm grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd
                     iscsi-init iscsid iscsiuio issue-add-ssh-keys kexec-load lm_sensors lunmask man-db-create
```

**(Continued on next page)**

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

$SPECrate®2017\_int\_base = 822$

$SPECrate®2017\_int\_peak = 845$

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## Platform Notes (Continued)

```
                multipathd ndctl-monitor nfs nfs-blkmap nfs-server nfsserver nm-cloud-setup nmb
                ostree-remount power-profiles-daemon rdisc rpcbind rpmconfigcheck rsyncd rtkit-daemon
                serial-getty@ smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd svnserve
                systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                systemd-time-wait-sync systemd-timesyncd udisks2 upower wicked wickedd-auto4 wickedd-dhcp4
                wickedd-dhcp6 wickedd-nanny wpa_supplicant@
  indirect      pcscd wickedd


  -------------------------------------------------------------
  14. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.24.81-default
    root=UUID=1370a640-700c-4b25-a152-2c5f9290f614
    splash=silent
    mitigations=auto
    quiet
    security=apparmorpcie_aspm=force
    pcie_aspm.policy=powersave
    intel_pstate=passive


  -------------------------------------------------------------
  15. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 3.50 GHz and 3.50 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
        Supported: yes
        Active: yes


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


  -------------------------------------------------------------
  17. 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


  -------------------------------------------------------------
  18. /sys/kernel/mm/transparent_hugepage
    defrag          always defer defer+madvise [madvise] never
    enabled         [always] madvise never
    hpage_pmd_size  2097152
```

**(Continued on next page)**

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

$SPECrate®2017\_int\_base = 822$

$SPECrate®2017\_int\_peak = 845$

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## Platform Notes (Continued)

```
   shmem_enabled    always within_size advise [never] deny force


   ----------------------------------------------------------------
19. /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


   ----------------------------------------------------------------
20. OS release
   From /etc/*-release /etc/*-version
   os-release SUSE Linux Enterprise Server 15 SP4


   ----------------------------------------------------------------
21. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2
   Filesystem      Type   Size  Used Avail Use% Mounted on
   tmpfs          tmpfs  120G  5.7G  115G   5% /mnt/ramdisk


   ----------------------------------------------------------------
22. /sys/devices/virtual/dmi/id
    Vendor:         Dell Inc.
    Product:        PowerEdge R760
    Product Family: PowerEdge
    Serial:         SLR7604


   ----------------------------------------------------------------
23. 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:
     8x 00CE 43 16 GB 3200
     2x 00CE00B300CE M321R8GA0BB0-CQKEG 64 GB 2 rank 4800
     14x 00CE069D00CE M321R8GA0BB0-CQKVG 64 GB 2 rank 4800



   ----------------------------------------------------------------
24. BIOS
(This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:        Dell Inc.
    BIOS Version:       2.1.3
    BIOS Date:          01/10/2024
    BIOS Revision:      2.1
```

## 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.
----------------------------------------------------------------------------------------------
```

**(Continued on next page)**

# SPEC CPU®2017 Integer Rate Result

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

SPECrate®2017_int_base = 822

SPECrate®2017_int_peak = 845

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## 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 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
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++      | 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
```

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

Fortran benchmarks:
```
ifx
```

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

# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

$SPECrate^{®}2017\_int\_base = 822$

$SPECrate^{®}2017\_int\_peak = 845$

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

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

## Peak Compiler Invocation

C benchmarks:
```
icx
```

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

Fortran benchmarks:
```
ifx
```

# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

SPECrate®2017_int_base = 822

SPECrate®2017_int_peak = 845

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

## 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/2024.0/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`(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/2024.0/lib -lqkmalloc`

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

**(Continued on next page)**

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

## Dell Inc.

PowerEdge R760 (Intel Xeon Max 9470)

SPECrate®2017_int_base = 822

SPECrate®2017_int_peak = 845

**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2024
**Hardware Availability:** May-2023
**Software Availability:** Dec-2023

# 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/Intel-ic2024-official-linux64.html`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.9.html`

---

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.9.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 2024-03-22 08:51:53-0400.
Report generated on 2024-07-30 19:30:06 by CPU2017 PDF formatter v6716.
Originally published on 2024-07-30.