SPEC CPU®2017 Integer Rate Result

Bull SAS

BullSequana SH160 (Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 7400

SPECrate®2017_int_peak = 7450
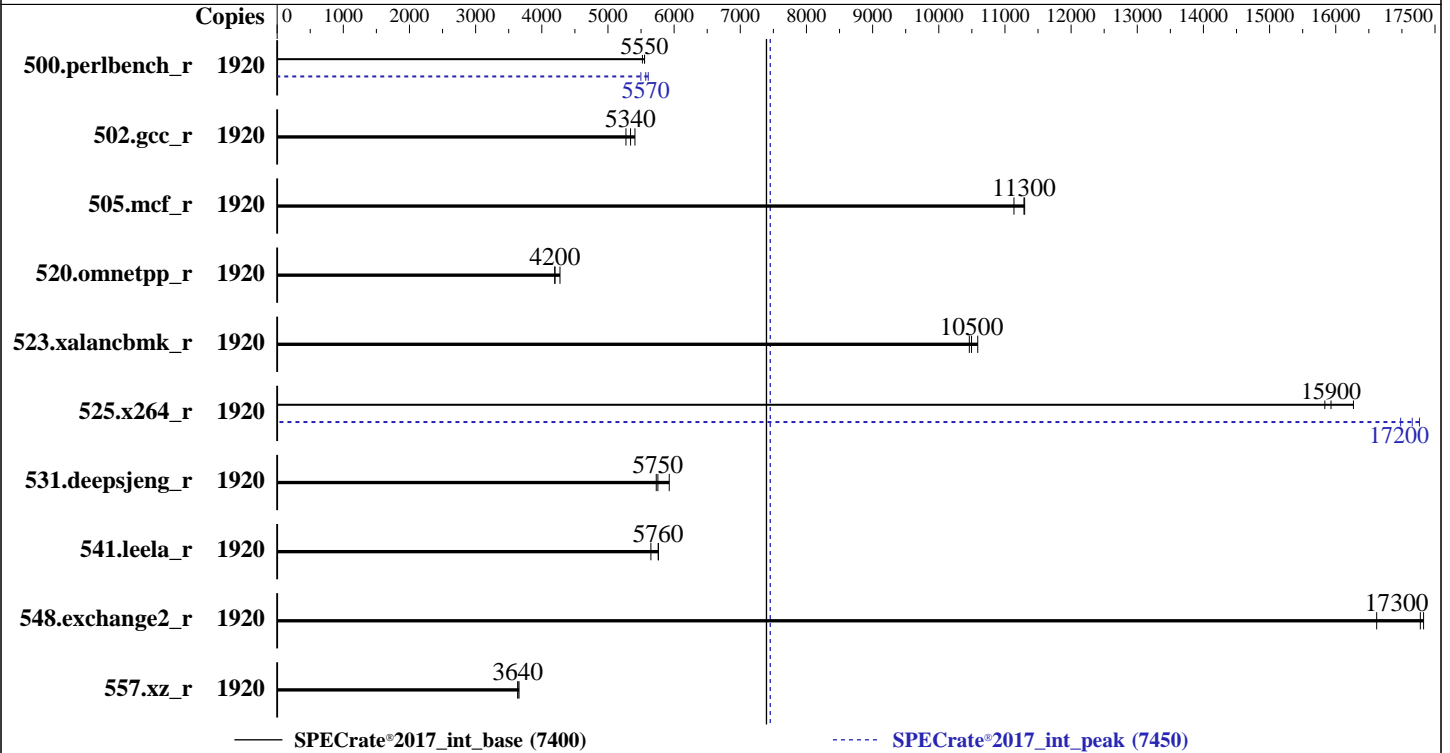
CPU2017 License: 20

Test Sponsor: Bull SAS

Tested by: Bull SAS

Test Date: Jun-2024

Hardware Availability: Jun-2024

Software Availability: Dec-2023

Benchmark	Copies	Result
500.perlbench_r	1920	5550 (base) / 5570 (peak)
502.gcc_r	1920	5340
505.mcf_r	1920	11300
520.omnetpp_r	1920	4200
523.xalancbmk_r	1920	10500
525.x264_r	1920	15900 (base) / 17200 (peak)
531.deepsjeng_r	1920	5750
541.leela_r	1920	5760
548.exchange2_r	1920	17300
557.xz_r	1920	3640

SPECrate®2017_int_base (7400)
SPECrate®2017_int_peak (7450)

Hardware

CPU Name: Intel Xeon Platinum 8490H

Max MHz: 3500

Nominal: 1900

Enabled: 960 cores, 16 chips, 2 threads/core

Orderable: 16 chips

Cache L1: 32 KB I + 48 KB D on chip per core

L2: 2 MB I+D on chip per core

L3: 112.5 MB I+D on chip per chip

Other: None

Memory: 8 TB (128 x 64 GB 2Rx4 PC5-4800B-R)

Storage: 1 x 15.4 TB NVME RAID SSD
1 x 960 GB NVME SSD

Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.2 (Plow)
5.14.0-284.30.1.el9_2.x86_64

Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;

Parallel: No

Firmware: Version BIOS_SAR121.78.00.024 released May-2024

File System: xfs

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

Peak Pointers: 64-bit

Other: None

Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	1920	**550**	**5550**	554	5520	550	5550	1920	**549**	**5570**	545	5610	556	5500
502.gcc_r	1920	**509**	**5340**	503	5410	516	5270	1920	**509**	**5340**	503	5410	516	5270
505.mcf_r	1920	279	11100	**275**	**11300**	275	11300	1920	279	11100	**275**	**11300**	275	11300
520.omnetpp_r	1920	601	4200	589	4270	**600**	**4200**	1920	601	4200	589	4270	**600**	**4200**
523.xalancbmk_r	1920	191	10600	194	10500	**193**	**10500**	1920	191	10600	194	10500	**193**	**10500**
525.x264_r	1920	**211**	**15900**	207	16300	212	15800	1920	**196**	**17200**	195	17300	198	17000
531.deepsjeng_r	1920	**382**	**5750**	384	5730	371	5930	1920	**382**	**5750**	384	5730	371	5930
541.leela_r	1920	563	5650	**552**	**5760**	552	5760	1920	563	5650	**552**	**5760**	552	5760
548.exchange2_r	1920	**291**	**17300**	290	17300	303	16600	1920	**291**	**17300**	290	17300	303	16600
557.xz_r	1920	567	3660	**570**	**3640**	570	3640	1920	567	3660	**570**	**3640**	570	3640

SPECrate®2017_int_base = **7400**

SPECrate®2017_int_peak = **7450**

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"
Not using the LTS version of the kernel

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/spec2017/spec/lib/intel64:/spec2017/spec/lib/ia32:/spec2017/spec/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>

Platform Notes

BIOS Configuration:
DCU Streamer Prefetcher = Disabled

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Platform Notes (Continued)

```
Power Performance Tuning = BIOS Controls EPB
Energy Perf Bias CFG mode = Performance0
Enable dIout tuning = enabled
LLC Dead Line Alloc = disabled
Package C State = C0/C1 state
Patrol Scrub = Disabled
BMC Configuration:
FansFullSpeed = True

 Sysinfo program /spec2017/spec/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on mesca516s-02 Wed Jun 26 15:51:54 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 252 (252-14.el9_2.3)
 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
 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 mesca516s-02 5.14.0-284.30.1.el9_2.x86_64 #1 SMP PREEMPT_DYNAMIC Fri Aug 25 09:13:12 EDT 2023 x86_64
   x86_64 x86_64 GNU/Linux

 ------------------------------------------------------------
 2. w
   15:51:54 up 1 day, 1:54, 3 users, load average: 0.45, 0.25, 0.27
   USER     TTY        LOGIN@   IDLE   JCPU    PCPU WHAT
   root     pts/1      11:05    2:12m  0.05s   0.05s -bash
   root     pts/0      15:48    1:30   0.00s   0.00s tail -f nohup.out
   simon-m  pts/2      11:40    1:59m  0.00s   0.00s sshd: simon-m [priv]

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

(Continued on next page)

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Platform Notes (Continued)

```
            ----------------------------------------------------------
            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) 33023523
              max locked memory           (kbytes, -l) 8192
              max memory size             (kbytes, -m) unlimited
              open files                      (-n) 40000
              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) 33023523
              virtual memory              (kbytes, -v) unlimited
              file locks                      (-x) unlimited


            ----------------------------------------------------------
            5. sysinfo process ancestry
             /usr/lib/systemd/systemd rhgb --system --deserialize 20
             sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
             sshd: root [priv]
             sshd: root@pts/0
             -bash
             /bin/sh ./run_one_rate.sh
             runcpu --copies 1920 --configfile mesca5_16S --define smt-on --define cores=960 --define
               invoke_with_interleave --define drop_caches --iterations=3 --reportable --size=ref --tune all -o all
               intrate
             runcpu --copies 1920 --configfile mesca5_16S --define smt-on --define cores=960 --define
               invoke_with_interleave --define drop_caches --iterations 3 --reportable --size ref --tune all
               --output_format all --nopower --runmode rate --tune base:peak --size refrate intrate --nopreenv
               --note-preenv --logfile $SPEC/tmp/CPU2017.065/templogs/preenv.intrate.065.0.log --lognum 065.0
               --from_runcpu 2
             specperl $SPEC/bin/sysinfo
             $SPEC = /spec2017/spec


            ----------------------------------------------------------
            6. /proc/cpuinfo
                model name       : Intel(R) Xeon(R) Platinum 8490H
                vendor_id        : GenuineIntel
                cpu family       : 6
                model            : 143
                stepping         : 8
                microcode        : 0x2b0004d0
                bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
                cpu cores        : 60
                siblings         : 120
                16 physical ids (chips)
                1920 processors (hardware threads)
                physical id 0: core ids 0-59
                physical id 1: core ids 0-59
                physical id 2: core ids 0-59
                physical id 3: core ids 0-59
                physical id 4: core ids 0-59
                physical id 5: core ids 0-59
                physical id 6: core ids 0-59
```

(Continued on next page)

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Platform Notes (Continued)

```
       physical id 7: core ids 0-59
       physical id 8: core ids 0-59
       physical id 9: core ids 0-59
       physical id 10: core ids 0-59
       physical id 11: core ids 0-59
       physical id 12: core ids 0-59
       physical id 13: core ids 0-59
       physical id 14: core ids 0-59
       physical id 15: core ids 0-59
       physical id 0: apicids 0-119
       physical id 1: apicids 128-247
       physical id 2: apicids 256-375
       physical id 3: apicids 384-503
       physical id 4: apicids 512-631
       physical id 5: apicids 640-759
       physical id 6: apicids 768-887
       physical id 7: apicids 896-1015
       physical id 8: apicids 1024-1143
       physical id 9: apicids 1152-1271
       physical id 10: apicids 1280-1399
       physical id 11: apicids 1408-1527
       physical id 12: apicids 1536-1655
       physical id 13: apicids 1664-1783
       physical id 14: apicids 1792-1911
       physical id 15: apicids 1920-2039
     Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
     virtualized systems.  Use the above data carefully.


     ----------------------------------------------------------
     7. lscpu

     From lscpu from util-linux 2.37.4:
       Architecture:                x86_64
       CPU op-mode(s):              32-bit, 64-bit
       Address sizes:               46 bits physical, 57 bits virtual
       Byte Order:                  Little Endian
       CPU(s):                      1920
       On-line CPU(s) list:         0-1919
       Vendor ID:                   GenuineIntel
       BIOS Vendor ID:              Intel(R) Corporation
       Model name:                  Intel(R) Xeon(R) Platinum 8490H
       BIOS Model name:             Intel(R) Xeon(R) Platinum 8490H
       CPU family:                  6
       Model:                       143
       Thread(s) per core:          2
       Core(s) per socket:          60
       Socket(s):                   16
       Stepping:                    8
       CPU max MHz:                 3500.0000
       CPU min MHz:                 800.0000
       BogoMIPS:                    3800.00
       Flags:                       fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                                    clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                                    lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                                    nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                                    ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1
                                    sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand
                                    lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3
                                    invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
                                    tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2
```

(Continued on next page)

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Platform Notes (Continued)

```
                       smep bmi2 erms invpcid 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 hwp hwp_act_window hwp_epp hwp_pkg_req 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:           45 MiB (960 instances)
  L1i cache:           30 MiB (960 instances)
  L2 cache:            1.9 GiB (960 instances)
  L3 cache:            1.8 GiB (16 instances)
  NUMA node(s):        16
  NUMA node0 CPU(s):   0-59,960-1019
  NUMA node1 CPU(s):   60-119,1020-1079
  NUMA node2 CPU(s):   120-179,1080-1139
  NUMA node3 CPU(s):   180-239,1140-1199
  NUMA node4 CPU(s):   240-299,1200-1259
  NUMA node5 CPU(s):   300-359,1260-1319
  NUMA node6 CPU(s):   360-419,1320-1379
  NUMA node7 CPU(s):   420-479,1380-1439
  NUMA node8 CPU(s):   480-539,1440-1499
  NUMA node9 CPU(s):   540-599,1500-1559
  NUMA node10 CPU(s):  600-659,1560-1619
  NUMA node11 CPU(s):  660-719,1620-1679
  NUMA node12 CPU(s):  720-779,1680-1739
  NUMA node13 CPU(s):  780-839,1740-1799
  NUMA node14 CPU(s):  840-899,1800-1859
  NUMA node15 CPU(s):  900-959,1860-1919
  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      45M   12 Data             1     64        1             64
    L1i       32K      30M    8 Instruction      1     64        1             64
    L2         2M     1.9G   16 Unified          2   2048        1             64
    L3     112.5M     1.8G   15 Unified          3 122880        1             64

    ------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 16 nodes (0-15)
  node 0 cpus: 0-59,960-1019
  node 0 size: 515027 MB
  node 0 free: 512784 MB
  node 1 cpus: 60-119,1020-1079
  node 1 size: 516069 MB
```

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Platform Notes (Continued)

```
     node 1 free: 515041 MB
     node 2 cpus: 120-179,1080-1139
     node 2 size: 516069 MB
     node 2 free: 514916 MB
     node 3 cpus: 180-239,1140-1199
     node 3 size: 516069 MB
     node 3 free: 515043 MB
     node 4 cpus: 240-299,1200-1259
     node 4 size: 516069 MB
     node 4 free: 515193 MB
     node 5 cpus: 300-359,1260-1319
     node 5 size: 516069 MB
     node 5 free: 515155 MB
     node 6 cpus: 360-419,1320-1379
     node 6 size: 516069 MB
     node 6 free: 515190 MB
     node 7 cpus: 420-479,1380-1439
     node 7 size: 516069 MB
     node 7 free: 515207 MB
     node 8 cpus: 480-539,1440-1499
     node 8 size: 516069 MB
     node 8 free: 514814 MB
     node 9 cpus: 540-599,1500-1559
     node 9 size: 516069 MB
     node 9 free: 514943 MB
     node 10 cpus: 600-659,1560-1619
     node 10 size: 516018 MB
     node 10 free: 514893 MB
     node 11 cpus: 660-719,1620-1679
     node 11 size: 516069 MB
     node 11 free: 514966 MB
     node 12 cpus: 720-779,1680-1739
     node 12 size: 516069 MB
     node 12 free: 515215 MB
     node 13 cpus: 780-839,1740-1799
     node 13 size: 516069 MB
     node 13 free: 515202 MB
     node 14 cpus: 840-899,1800-1859
     node 14 size: 516069 MB
     node 14 free: 515177 MB
     node 15 cpus: 900-959,1860-1919
     node 15 size: 515992 MB
     node 15 free: 515111 MB
     node distances:
     node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
       0:  10  21  21  21  41  41  41  41  41  41  41  41  41  41  41  41
       1:  21  10  21  21  41  41  41  41  41  41  41  41  41  41  41  41
       2:  21  21  10  21  41  41  41  41  41  41  41  41  41  41  41  41
       3:  21  21  21  10  41  41  41  41  41  41  41  41  41  41  41  41
       4:  41  41  41  41  10  21  21  21  41  41  41  41  41  41  41  41
       5:  41  41  41  41  21  10  21  21  41  41  41  41  41  41  41  41
       6:  41  41  41  41  21  21  10  21  41  41  41  41  41  41  41  41
       7:  41  41  41  41  21  21  21  10  41  41  41  41  41  41  41  41
       8:  41  41  41  41  41  41  41  41  10  21  21  21  41  41  41  41
       9:  41  41  41  41  41  41  41  41  21  10  21  21  41  41  41  41
      10:  41  41  41  41  41  41  41  41  21  21  10  21  41  41  41  41
      11:  41  41  41  41  41  41  41  41  21  21  21  10  41  41  41  41
      12:  41  41  41  41  41  41  41  41  41  41  41  41  10  21  21  21
      13:  41  41  41  41  41  41  41  41  41  41  41  41  21  10  21  21
      14:  41  41  41  41  41  41  41  41  41  41  41  41  21  21  10  21
```

(Continued on next page)

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Platform Notes (Continued)

```
   15:  41  41  41  41  41  41  41  41  41  41  41  41  21  21  21  10


  ------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       8454088440 kB


  ------------------------------------------------------------
10. who -r
  run-level 3 Jun 25 18:02 last=5


  ------------------------------------------------------------
11. Systemd service manager version: systemd 252 (252-14.el9_2.3)
  Default Target  Status
  multi-user      degraded


  ------------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
    UNIT                 LOAD   ACTIVE SUB    DESCRIPTION
  * packagekit.service loaded failed failed PackageKit Daemon


  ------------------------------------------------------------
13. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                   accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker firewalld
                   gdm getty@ insights-client-boot irqbalance iscsi iscsi-onboot kdump libstoragemgmt
                   low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname
                   nvmefc-boot-connections ostree-remount power-profiles-daemon qemu-guest-agent rhsmcertd
                   rsyslog rtkit-daemon selinux-autorelabel-mark smartd sshd sssd switcheroo-control
                   systemd-boot-update systemd-network-generator tuned udisks2 upower vgauthd vmtoolsd
  enabled-runtime  systemd-remount-fs
  disabled         arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown
                   canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed
                   dbus-daemon debug-shell dnf-system-upgrade dnsmasq iprdump iprinit iprupdate iscsid
                   iscsiuio kpatch kvm_stat ledmon man-db-restart-cache-update nftables nvmf-autoconnect
                   ostree-readonly-sysroot-migration podman podman-auto-update podman-clean-transient
                   podman-kube@ podman-restart psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts
                   rpmdb-rebuild selinux-check-proper-disable speech-dispatcherd sshd-keygen@
                   systemd-boot-check-no-failures systemd-pstore systemd-sysext wpa_supplicant
  indirect         serial-getty@ spice-vdagentd 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=(hd6,gpt2)/vmlinuz-5.14.0-284.30.1.el9_2.x86_64
  root=/dev/mapper/rhel-root
  ro
  crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
  resume=/dev/mapper/rhel-swap
  rd.lvm.lv=rhel/root
  rd.lvm.lv=rhel/swap
  pci=nobar
  selinux=0
  rhgb
  tsc=nowatchdog
  console=ttyS0,115200
  udev.children-max=512
  nmi_watchdog=0
  add_efi_memmap
  pci=nobar
```

Bull SAS

BullSequana SH160 (Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 7400

SPECrate®2017_int_peak = 7450

CPU2017 License: 20
Test Sponsor: Bull SAS
Tested by: Bull SAS

Test Date: Jun-2024
Hardware Availability: Jun-2024
Software Availability: Dec-2023

Platform Notes (Continued)

```
    earlyprintk=ttyS0,115200

    ---------------------------------------------------------------
15. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 800 MHz 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            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                   40
   vm.dirty_writeback_centisecs     1500
   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
   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     Red Hat Enterprise Linux 9.2 (Plow)
   redhat-release Red Hat Enterprise Linux release 9.2 (Plow)
```

(Continued on next page)

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CPU2017 License:	20	**Test Date:**	Jun-2024
Test Sponsor:	Bull SAS	**Hardware Availability:**	Jun-2024
Tested by:	Bull SAS	**Software Availability:**	Dec-2023

Platform Notes (Continued)

```
   system-release Red Hat Enterprise Linux release 9.2 (Plow)


    ----------------------------------------------------------
    21. Disk information
    SPEC is set to: /spec2017/spec
      Filesystem      Type  Size  Used Avail Use% Mounted on
      /dev/sdb        xfs    14T   11T  3.7T  75% /spec2017


    ----------------------------------------------------------
    22. /sys/devices/virtual/dmi/id
        Vendor:           BULL
        Product:          BullSequana S series
        Product Family: -
        Serial:           -


    ----------------------------------------------------------
    23. 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:
        128x Hynix HMCG94AEBRA109N 64 GB 2 rank 4800


    ----------------------------------------------------------
    24. BIOS
    (This section combines info from /sys/devices and dmidecode.)
        BIOS Vendor:       BULL
        BIOS Version:      BIOS_SAR121.78.00.024
        BIOS Date:         04/09/2024
        BIOS Revision:     121.78
```

Compiler Version Notes

```
==============================================================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base, peak) 505.mcf_r(base, peak) 525.x264_r(base, peak)
         | 557.xz_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
         | 541.leela_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
Fortran | 548.exchange2_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------
```

SPEC CPU®2017 Integer Rate Result

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Bull SAS

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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 -xsapphirerapids -O3 -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

C++ benchmarks:
`-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

Fortran benchmarks:
`-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-nostandard-realloc-lhs -align array32byte -auto`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

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

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Software Availability: Dec-2023

Peak Compiler Invocation

C benchmarks:
```
icx
```

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

Fortran benchmarks:
```
ifx
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
500.perlbench_r: -w -std=c11 -m64 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

```
502.gcc_r: basepeak = yes
```

```
505.mcf_r: basepeak = yes
```

```
525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fno-alias
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

```
557.xz_r: basepeak = yes
```

C++ benchmarks:

```
520.omnetpp_r: basepeak = yes
```

(Continued on next page)

Bull SAS

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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/BullSequanaSH-Flags-V1.0.2024-08-07.html`
`http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/BullSequanaSH-Flags-V1.0.2024-08-07.xml`
`http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml`

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

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