SPEC CPU®2017 Integer Rate Result

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Bull SAS

BullSequana SH40 (Intel Xeon Platinum 8490H)

$SPECrate^®2017\_int\_base = 1920$

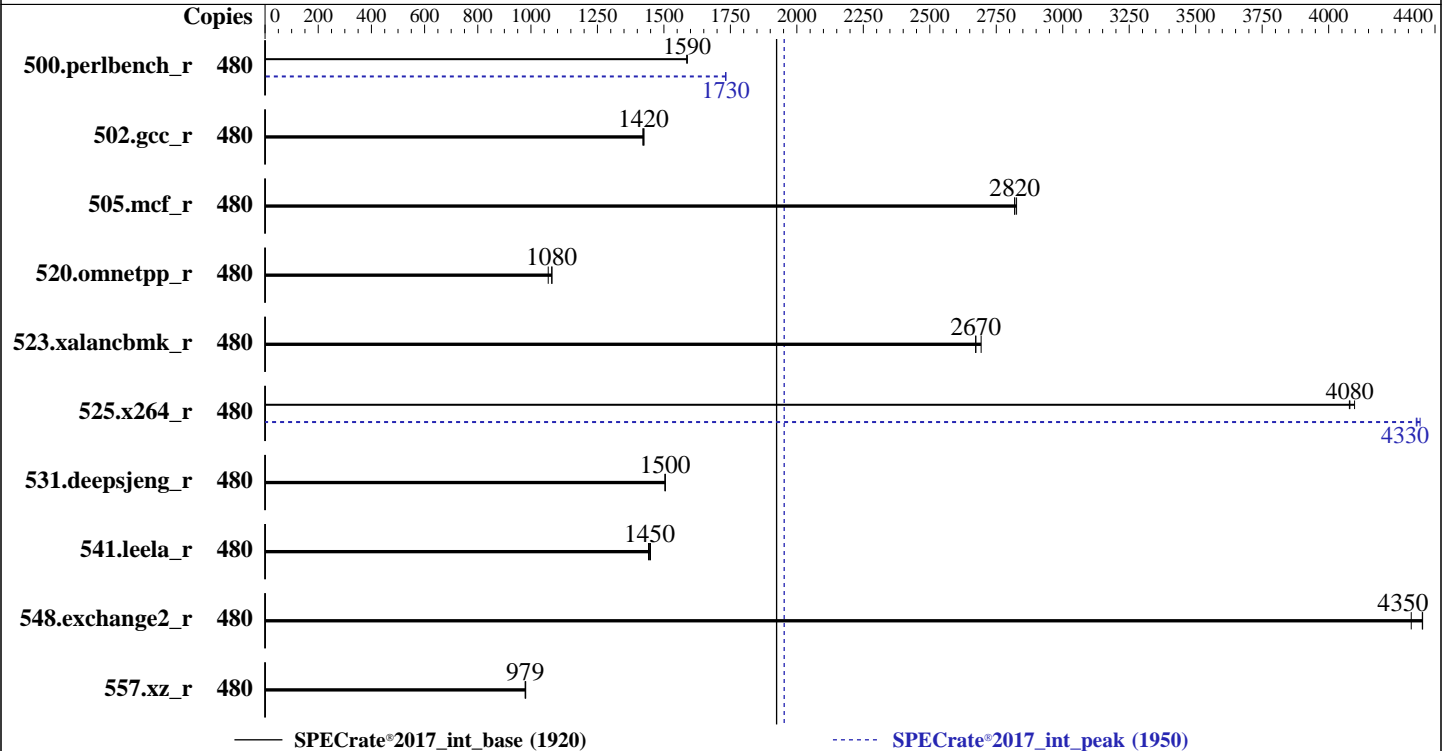$SPECrate^®2017\_int\_peak = 1950$

CPU2017 License: 20

Test Sponsor: Bull SAS

Tested by: Bull SAS

Test Date: May-2024

Hardware Availability: Jun-2023

Software Availability: Dec-2023

Benchmark	Copies	Base	Peak
500.perlbench_r	480	1590	1730
502.gcc_r	480	1420	
505.mcf_r	480	2820	
520.omnetpp_r	480	1080	
523.xalancbmk_r	480	2670	
525.x264_r	480	4080	4330
531.deepsjeng_r	480	1500	
541.leela_r	480	1450	
548.exchange2_r	480	4350	
557.xz_r	480	979	

SPECrate®2017_int_base (1920)   SPECrate®2017_int_peak (1950)

Hardware

CPU Name: Intel Xeon Platinum 8490H

  Max MHz: 3500

  Nominal: 1900

Enabled: 240 cores, 4 chips, 2 threads/core

Orderable: 4 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: 2 TB (32 x 64 GB 2Rx4 PC5-4800B-R)

Storage: 480 GB NVME SSD

Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.2 (Plow)
5.14.0-284.11.1.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_SAR120.79.00.006 released May-2024

File System: xfs

System State: Run level 5 (graphical)

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.

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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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	480	482	1590	481	1590	**481**	**1590**	480	**441**	**1730**	441	1730	441	1730
502.gcc_r	480	478	1420	477	1430	**478**	**1420**	480	478	1420	477	1430	**478**	**1420**
505.mcf_r	480	274	2830	**275**	**2820**	275	2820	480	274	2830	**275**	**2820**	275	2820
520.omnetpp_r	480	591	1070	**584**	**1080**	584	1080	480	591	1070	**584**	**1080**	584	1080
523.xalancbmk_r	480	188	2690	**190**	**2670**	190	2670	480	188	2690	**190**	**2670**	190	2670
525.x264_r	480	205	4100	**206**	**4080**	206	4080	480	193	4340	194	4330	**194**	**4330**
531.deepsjeng_r	480	**366**	**1500**	366	1500	366	1500	480	**366**	**1500**	366	1500	366	1500
541.leela_r	480	**550**	**1450**	551	1440	548	1450	480	**550**	**1450**	551	1440	548	1450
548.exchange2_r	480	289	4350	292	4310	**289**	**4350**	480	289	4350	292	4310	**289**	**4350**
557.xz_r	480	529	980	**530**	**979**	530	979	480	529	980	**530**	**979**	530	979
SPECrate®2017_int_base =	**1920**													
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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 = "/home/spec/lib/intel64:/home/spec/lib/ia32:/home/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:
Patrol Scrub = Disabled
```

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Platform Notes (Continued)

```
SNC = Enable SNC4 (4-clusters)
DCU Streamer Prefetcher = Disabled
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
BMC Configuration:
FansFullSpeed = True

 Sysinfo program /home/spec/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on gaia Tue May 28 18:37:21 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. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
 ------------------------------------------------------------


 ------------------------------------------------------------
 1. uname -a
   Linux gaia 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
    18:37:22 up 4 min,  0 users,  load average: 0.25, 1.54, 0.89
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT

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


 ------------------------------------------------------------
 4. ulimit -a
```

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Platform Notes (Continued)

```
   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) 8252039
   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) 8252039
   virtual memory              (kbytes, -v) unlimited
   file locks                  (-x) unlimited


   ------------------------------------------------------------
 5. sysinfo process ancestry
  /usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
  bash run_one_rate.sh 3 intrate
  runcpu --define default-platform-flags --copies 480 --configfile mesca5_4S --define smt-on --define numactl
    --define cores=240 --define invoke_with_interleave --define drop_caches --iterations=3 --reportable
    --size=ref --tune all -o all intrate
  runcpu --define default-platform-flags --copies 480 --configfile mesca5_4S --define smt-on --define numactl
    --define cores=240 --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/CPU2017.047/templogs/preenv.intrate.047.0.log --lognum 047.0
    --from_runcpu 2
  specperl $SPEC/bin/sysinfo
 $SPEC = /home/spec


   ------------------------------------------------------------
 6. /proc/cpuinfo
    model name       : Intel(R) Xeon(R) Platinum 8490H
    vendor_id        : GenuineIntel
    cpu family       : 6
    model            : 143
    stepping         : 8
    microcode        : 0x2b0005c0
    bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores        : 60
    siblings         : 120
    4 physical ids (chips)
    480 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 0: apicids 0-119
    physical id 1: apicids 128-247
    physical id 2: apicids 256-375
    physical id 3: apicids 384-503
   Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
   virtualized systems.  Use the above data carefully.


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

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Platform Notes (Continued)

```
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):                     480
  On-line CPU(s) list:        0-479
  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):                  4
  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
                              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:                  11.3 MiB (240 instances)
  L1i cache:                  7.5 MiB (240 instances)
  L2 cache:                   480 MiB (240 instances)
  L3 cache:                   450 MiB (4 instances)
  NUMA node(s):               16
  NUMA node0 CPU(s):          0-14,240-254
  NUMA node1 CPU(s):          15-29,255-269
  NUMA node2 CPU(s):          30-44,270-284
  NUMA node3 CPU(s):          45-59,285-299
  NUMA node4 CPU(s):          60-74,300-314
  NUMA node5 CPU(s):          75-89,315-329
  NUMA node6 CPU(s):          90-104,330-344
  NUMA node7 CPU(s):          105-119,345-359
  NUMA node8 CPU(s):          120-134,360-374
  NUMA node9 CPU(s):          135-149,375-389
  NUMA node10 CPU(s):         150-164,390-404
  NUMA node11 CPU(s):         165-179,405-419
  NUMA node12 CPU(s):         180-194,420-434
  NUMA node13 CPU(s):         195-209,435-449
  NUMA node14 CPU(s):         210-224,450-464
  NUMA node15 CPU(s):         225-239,465-479
```

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Platform Notes (Continued)

```
  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    11.3M   12 Data           1     64      1             64
      L1i      32K     7.5M    8 Instruction    1     64      1             64
      L2        2M     480M   16 Unified        2   2048      1             64
      L3    112.5M     450M   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: 0-14,240-254
  node 0 size: 127876 MB
  node 0 free: 127376 MB
  node 1 cpus: 15-29,255-269
  node 1 size: 129017 MB
  node 1 free: 128585 MB
  node 2 cpus: 30-44,270-284
  node 2 size: 129017 MB
  node 2 free: 128709 MB
  node 3 cpus: 45-59,285-299
  node 3 size: 129017 MB
  node 3 free: 128779 MB
  node 4 cpus: 60-74,300-314
  node 4 size: 129017 MB
  node 4 free: 128805 MB
  node 5 cpus: 75-89,315-329
  node 5 size: 129017 MB
  node 5 free: 128769 MB
  node 6 cpus: 90-104,330-344
  node 6 size: 129017 MB
  node 6 free: 128432 MB
  node 7 cpus: 105-119,345-359
  node 7 size: 128978 MB
  node 7 free: 128677 MB
  node 8 cpus: 120-134,360-374
  node 8 size: 129017 MB
  node 8 free: 128759 MB
  node 9 cpus: 135-149,375-389
  node 9 size: 129017 MB
  node 9 free: 128776 MB
  node 10 cpus: 150-164,390-404
  node 10 size: 129017 MB
  node 10 free: 128801 MB
  node 11 cpus: 165-179,405-419
  node 11 size: 129017 MB
  node 11 free: 128738 MB
```

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Platform Notes (Continued)

```
    node 12 cpus: 180-194,420-434
    node 12 size: 129017 MB
    node 12 free: 128795 MB
    node 13 cpus: 195-209,435-449
    node 13 size: 129017 MB
    node 13 free: 128823 MB
    node 14 cpus: 210-224,450-464
    node 14 size: 129017 MB
    node 14 free: 128674 MB
    node 15 cpus: 225-239,465-479
    node 15 size: 128993 MB
    node 15 free: 128789 MB
    node distances:
    node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
      0:  10  12  12  12  21  21  21  21  21  21  21  21  31  31  31  31
      1:  12  10  12  12  21  21  21  21  21  21  21  21  31  31  31  31
      2:  12  12  10  12  21  21  21  21  21  21  21  21  31  31  31  31
      3:  12  12  12  10  21  21  21  21  21  21  21  21  31  31  31  31
      4:  21  21  21  21  10  12  12  12  31  31  31  31  21  21  21  21
      5:  21  21  21  21  12  10  12  12  31  31  31  31  21  21  21  21
      6:  21  21  21  21  12  12  10  12  31  31  31  31  21  21  21  21
      7:  21  21  21  21  12  12  12  10  31  31  31  31  21  21  21  21
      8:  21  21  21  21  31  31  31  31  10  12  12  12  21  21  21  21
      9:  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21
     10:  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21
     11:  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21
     12:  31  31  31  31  21  21  21  21  21  21  21  21  10  12  12  12
     13:  31  31  31  31  21  21  21  21  21  21  21  21  12  10  12  12
     14:  31  31  31  31  21  21  21  21  21  21  21  21  12  12  10  12
     15:  31  31  31  31  21  21  21  21  21  21  21  21  12  12  12  10


    -----------------------------------------------------------
    9. /proc/meminfo
       MemTotal:       2112586456 kB


    -----------------------------------------------------------
    10. who -r
      run-level 5 Mar 20 01:01


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


    -----------------------------------------------------------
    12. 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
```

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Platform Notes (Continued)

```
                    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

   ------------------------------------------------------------
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
   crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root
   rd.lvm.lv=rhel/swap
   rhgb
   quiet
   udev.children-max=64
   console=tty0
   console=ttyS0,115200


   ------------------------------------------------------------
14. 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


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


   ------------------------------------------------------------
16. sysctl
   kernel.numa_balancing             1
   kernel.randomize_va_space         2
   vm.compaction_proactiveness       20
   vm.dirty_background_bytes          0
   vm.dirty_background_ratio         10
   vm.dirty_bytes                     0
   vm.dirty_expire_centisecs       3000
   vm.dirty_ratio                    40
   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


   ------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage
   defrag          always defer defer+madvise [madvise] never
```

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BullSequana SH40 (Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 1920

SPECrate®2017_int_peak = 1950

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

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

Platform Notes (Continued)

```
    enabled         [always] madvise never
    hpage_pmd_size  2097152
    shmem_enabled   always within_size advise [never] deny force


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


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


  ----------------------------------------------------------------
20. Disk information
SPEC is set to: /home/spec
    Filesystem             Type  Size  Used Avail Use% Mounted on
    /dev/mapper/rhel-home xfs   372G  7.1G  365G   2% /home


  ----------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
      Vendor:          BULL
      Product:         BullSequana S series
      Product Family: -
      Serial:          XAN-S33-00034


  ----------------------------------------------------------------
22. 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:
        20x Micron MTC40F2046S1RC48BA1 64 GB 2 rank 4800
        12x Micron MTC40F2046S1RC48BA12 64 GB 2 rank 4800


  ----------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:      BULL
      BIOS Version:     BIOS_SAR120.79.00.006
      BIOS Date:        04/30/2024
      BIOS Revision:    120.79
```

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)
----------------------------------------------------------------------------------------------
```

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Bull SAS

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Compiler Version Notes (Continued)

```
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.
------------------------------------------------------------------------------------------------------
```

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`

SPEC CPU®2017 Integer Rate Result

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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
```

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)
```

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Peak Optimization Flags (Continued)

500.perlbench_r (continued):
```
-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

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

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

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