SPEC CPU®2017 Integer Rate Result

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Bull SAS

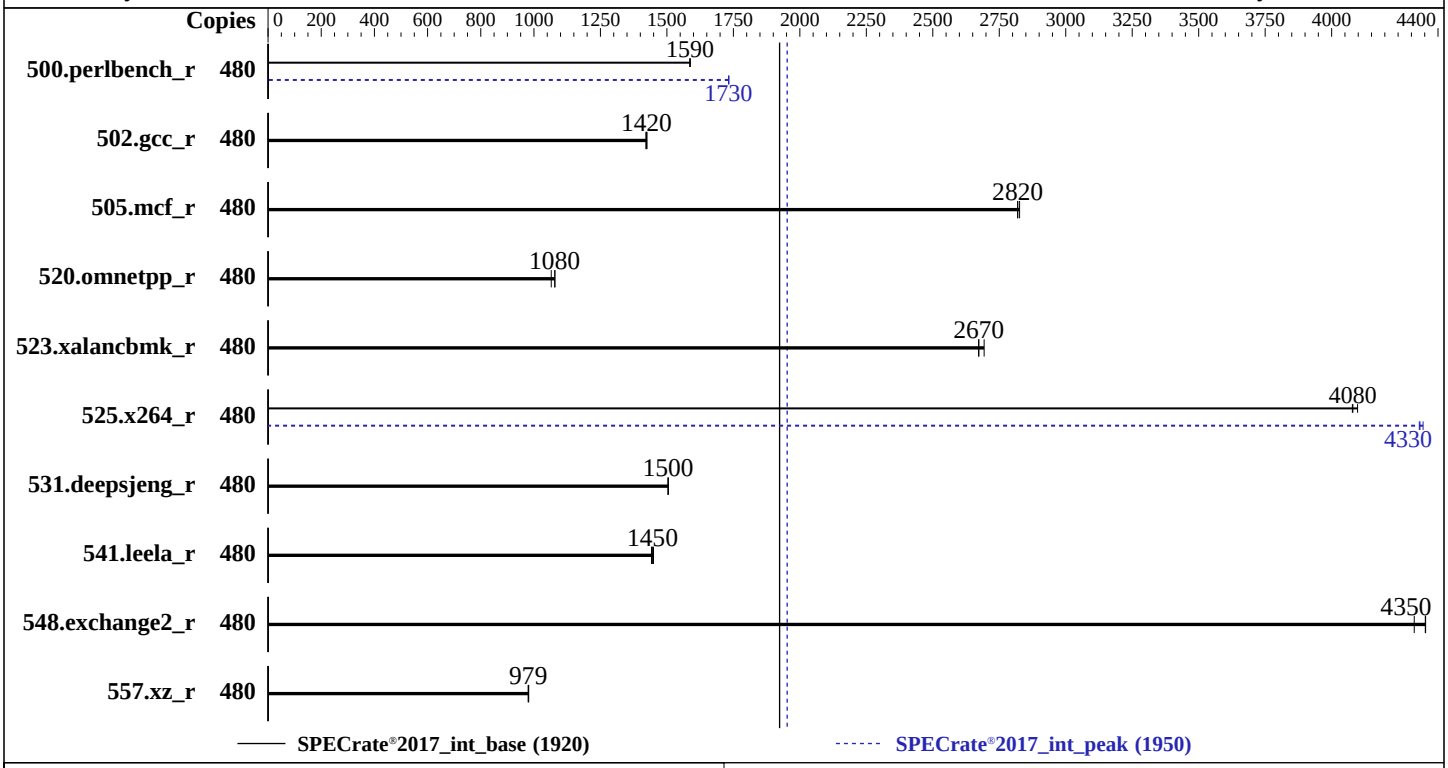
BullSequana SH40 (Intel Xeon Platinum 8490H)

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



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.

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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

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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
```

(Continued on next page)

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
```

(Continued on next page)

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
```

(Continued on next page)

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
```

(Continued on next page)

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
```

(Continued on next page)

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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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
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------------------------------------------------------------------------------------------------------------

============================================================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
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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`

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)

(Continued on next page)

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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