



# SPEC CPU®2017 Integer Rate Result

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## Bull SAS

SPECrate®2017\_int\_base = 2790

### BullSequana SH80 (Intel Xeon Platinum 8490H)

SPECrate®2017\_int\_peak = 2830

CPU2017 License: 20

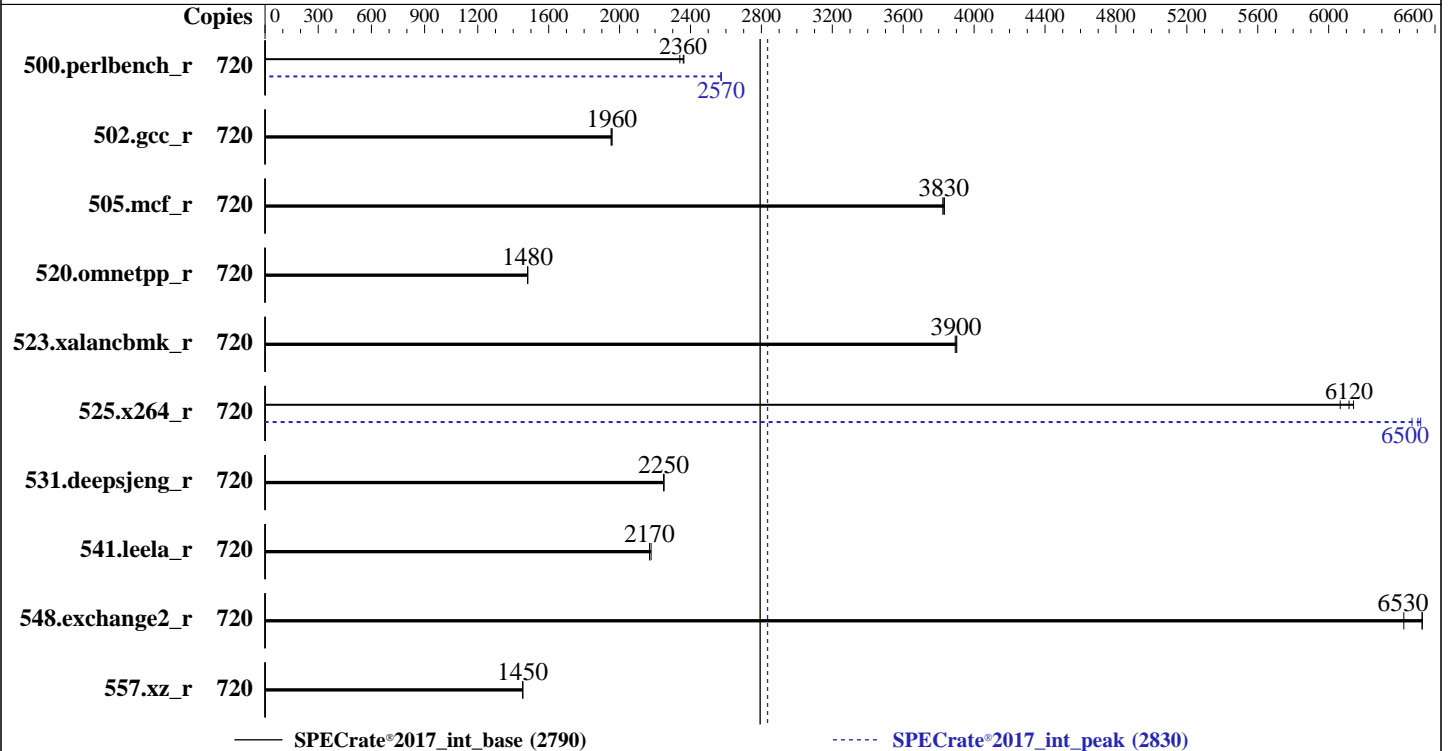
Test Sponsor: Bull SAS

Tested by: Bull SAS

Test Date: Jun-2024

Hardware Availability: Jun-2023

Software Availability: Dec-2023



### Hardware

CPU Name: Intel Xeon Platinum 8490H  
 Max MHz: 3500  
 Nominal: 1900  
 Enabled: 360 cores, 6 chips, 2 threads/core  
 Orderable: 6,8 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: 4 TB (64 x 64 GB 2Rx4 PC5-4800B-R, running at 4400)  
 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\_SAR120.79.01.609 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	720	490	2340	<b>486</b>	<b>2360</b>	485	2360	720	446	2570	<b>445</b>	<b>2570</b>	445	2570
502.gcc_r	720	521	1960	522	1950	<b>521</b>	<b>1960</b>	720	521	1960	522	1950	<b>521</b>	<b>1960</b>
505.mcf_r	720	<b>304</b>	<b>3830</b>	304	3830	304	3820	720	<b>304</b>	<b>3830</b>	304	3830	304	3820
520.omnetpp_r	720	638	1480	<b>638</b>	<b>1480</b>	638	1480	720	638	1480	<b>638</b>	<b>1480</b>	638	1480
523.xalancbmk_r	720	<b>195</b>	<b>3900</b>	195	3900	195	3890	720	<b>195</b>	<b>3900</b>	195	3900	195	3890
525.x264_r	720	205	6140	<b>206</b>	<b>6120</b>	208	6070	720	193	6520	<b>194</b>	<b>6500</b>	195	6470
531.deepsjeng_r	720	367	2250	367	2250	<b>367</b>	<b>2250</b>	720	367	2250	367	2250	<b>367</b>	<b>2250</b>
541.leela_r	720	547	2180	<b>550</b>	<b>2170</b>	550	2170	720	547	2180	<b>550</b>	<b>2170</b>	550	2170
548.exchange2_r	720	<b>289</b>	<b>6530</b>	289	6530	294	6420	720	<b>289</b>	<b>6530</b>	289	6530	294	6420
557.xz_r	720	535	1450	<b>535</b>	<b>1450</b>	535	1450	720	535	1450	<b>535</b>	<b>1450</b>	535	1450

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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 Mon Jun 24 16:49:06 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  
 16:49:07 up 40 min, 1 user, load average: 0.00, 0.00, 0.00  
 USER TTY LOGIN@ IDLE JCPU PCPU WHAT  
 root pts/0 16:11 35.00s 1.18s 0.00s tail -f nohup.out  
 -----

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

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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) 16508839
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) 16508839
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

```

```

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@pts/0
-bash
bash run_one_rate.sh 3 intrate
runcpu --define default-platform-flags --copies 720 --configfile mesca5_6S --define smt-on --define numactl
--define cores=360 --define invoke_with_interleave --define drop_caches --iterations=3 --reportable
--size=ref --tune all -o all intrate
runcpu --define default-platform-flags --copies 720 --configfile mesca5_6S --define smt-on --define numactl
--define cores=360 --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/CPU2017.063/temlogs/preenv.intrate.063.0.log --lognum 063.0
--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
6 physical ids (chips)
720 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 0:  apicids 0-119
physical id 1:  apicids 128-247
physical id 2:  apicids 256-375

```

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### Platform Notes (Continued)

physical id 3: apicids 384-503

physical id 4: apicids 512-631

physical id 5: apicids 640-759

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):                 720
On-line CPU(s) list:   0-719
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):               6
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 bml1 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_lld arch_capabilities

Virtualization:         VT-x
L1d cache:              16.9 MiB (360 instances)
L1i cache:              11.3 MiB (360 instances)
L2 cache:                720 MiB (360 instances)
L3 cache:                675 MiB (6 instances)
NUMA node(s):           24
NUMA node0 CPU(s):      0-14,360-374
NUMA node1 CPU(s):      15-29,375-389
NUMA node2 CPU(s):      30-44,390-404
NUMA node3 CPU(s):      45-59,405-419
NUMA node4 CPU(s):      60-74,420-434
NUMA node5 CPU(s):      75-89,435-449
NUMA node6 CPU(s):      90-104,450-464

```

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### Platform Notes (Continued)

```

NUMA node7 CPU(s):      105-119,465-479
NUMA node8 CPU(s):      120-134,480-494
NUMA node9 CPU(s):      135-149,495-509
NUMA node10 CPU(s):     150-164,510-524
NUMA node11 CPU(s):     165-179,525-539
NUMA node12 CPU(s):     180-194,540-554
NUMA node13 CPU(s):     195-209,555-569
NUMA node14 CPU(s):     210-224,570-584
NUMA node15 CPU(s):     225-239,585-599
NUMA node16 CPU(s):     240-254,600-614
NUMA node17 CPU(s):     255-269,615-629
NUMA node18 CPU(s):     270-284,630-644
NUMA node19 CPU(s):     285-299,645-659
NUMA node20 CPU(s):     300-314,660-674
NUMA node21 CPU(s):     315-329,675-689
NUMA node22 CPU(s):     330-344,690-704
NUMA node23 CPU(s):     345-359,705-719
Vulnerability Itlb multihit: Not affected
Vulnerability Lltf:       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/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBR SB-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	16.9M	12	Data	1	64	1	64
L1i	32K	11.3M	8	Instruction	1	64	1	64
L2	2M	720M	16	Unified	2	2048	1	64
L3	112.5M	675M	15	Unified	3	122880	1	64

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

```

available: 24 nodes (0-23)
node 0 cpus: 0-14,360-374
node 0 size: 256771 MB
node 0 free: 256218 MB
node 1 cpus: 15-29,375-389
node 1 size: 258041 MB
node 1 free: 257809 MB
node 2 cpus: 30-44,390-404
node 2 size: 258041 MB
node 2 free: 257725 MB
node 3 cpus: 45-59,405-419
node 3 size: 258041 MB
node 3 free: 257783 MB
node 4 cpus: 60-74,420-434
node 4 size: 258041 MB
node 4 free: 257799 MB
node 5 cpus: 75-89,435-449
node 5 size: 258001 MB
node 5 free: 257730 MB
node 6 cpus: 90-104,450-464

```

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### Platform Notes (Continued)

```

node 6 size: 258041 MB
node 6 free: 257577 MB
node 7 cpus: 105-119,465-479
node 7 size: 258041 MB
node 7 free: 257792 MB
node 8 cpus: 120-134,480-494
node 8 size: 129017 MB
node 8 free: 128270 MB
node 9 cpus: 135-149,495-509
node 9 size: 129017 MB
node 9 free: 128756 MB
node 10 cpus: 150-164,510-524
node 10 size: 129017 MB
node 10 free: 128715 MB
node 11 cpus: 165-179,525-539
node 11 size: 129017 MB
node 11 free: 128759 MB
node 12 cpus: 180-194,540-554
node 12 size: 129017 MB
node 12 free: 128749 MB
node 13 cpus: 195-209,555-569
node 13 size: 129017 MB
node 13 free: 128780 MB
node 14 cpus: 210-224,570-584
node 14 size: 129017 MB
node 14 free: 128750 MB
node 15 cpus: 225-239,585-599
node 15 size: 129017 MB
node 15 free: 128775 MB
node 16 cpus: 240-254,600-614
node 16 size: 129017 MB
node 16 free: 128678 MB
node 17 cpus: 255-269,615-629
node 17 size: 129017 MB
node 17 free: 128785 MB
node 18 cpus: 270-284,630-644
node 18 size: 129017 MB
node 18 free: 128721 MB
node 19 cpus: 285-299,645-659
node 19 size: 129017 MB
node 19 free: 128773 MB
node 20 cpus: 300-314,660-674
node 20 size: 129017 MB
node 20 free: 128778 MB
node 21 cpus: 315-329,675-689
node 21 size: 129017 MB
node 21 free: 128776 MB
node 22 cpus: 330-344,690-704
node 22 size: 129017 MB
node 22 free: 128745 MB
node 23 cpus: 345-359,705-719
node 23 size: 128991 MB
node 23 free: 128725 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
  0: 10 12 12 12 21 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21
  1: 12 10 12 12 21 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21
  2: 12 12 10 12 21 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21
  3: 12 12 12 10 21 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21
  4: 21 21 21 21 10 12 12 12 31 31 31 31 21 21 21 21 21 21 21 21 21 21 21

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### Platform Notes (Continued)

5:	21	21	21	21	12	10	12	12	31	31	31	31	21	21	21	21	21	21	31	31	31	31	
6:	21	21	21	21	12	12	10	12	31	31	31	31	21	21	21	21	21	21	21	31	31	31	31
7:	21	21	21	21	12	12	12	10	31	31	31	31	21	21	21	21	21	21	21	31	31	31	31
8:	21	21	21	21	31	31	31	31	10	12	12	12	21	21	21	21	21	21	21	31	31	31	31
9:	21	21	21	21	31	31	31	31	12	10	12	12	21	21	21	21	21	21	21	31	31	31	31
10:	21	21	21	21	31	31	31	31	12	12	10	12	21	21	21	21	21	21	21	31	31	31	31
11:	21	21	21	21	31	31	31	31	12	12	12	10	21	21	21	21	21	21	21	31	31	31	31
12:	31	31	31	31	21	21	21	21	21	21	21	10	12	12	12	31	31	31	31	21	21	21	21
13:	31	31	31	31	21	21	21	21	21	21	21	12	10	12	12	31	31	31	31	21	21	21	21
14:	31	31	31	31	21	21	21	21	21	21	21	12	12	10	12	31	31	31	31	21	21	21	21
15:	31	31	31	31	21	21	21	21	21	21	21	12	12	10	12	31	31	31	31	21	21	21	21
16:	31	31	31	31	21	21	21	21	21	21	21	31	31	31	10	12	12	12	21	21	21	21	
17:	31	31	31	31	21	21	21	21	21	21	21	31	31	31	12	10	12	12	21	21	21	21	
18:	31	31	31	31	21	21	21	21	21	21	21	31	31	31	12	12	10	12	21	21	21	21	
19:	31	31	31	31	21	21	21	21	21	21	21	31	31	31	12	12	12	10	21	21	21	21	
20:	21	21	21	21	31	31	31	31	31	31	31	21	21	21	21	21	21	21	21	10	12	12	12
21:	21	21	21	21	31	31	31	31	31	31	31	21	21	21	21	21	21	21	21	12	10	12	12
22:	21	21	21	21	31	31	31	31	31	31	31	21	21	21	21	21	21	21	21	12	12	10	12
23:	21	21	21	21	31	31	31	31	31	31	31	21	21	21	21	21	21	21	21	12	12	10	12

9. /proc/meminfo  
MemTotal: 4226327272 kB

10. who -r  
run-level 5 Jun 24 16:10

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 firewallld gdm getty@ insights-client-boot irqbalance iscsi iscsi-onboot kdump libstoragemgmt low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname nvme-fc-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 iprddump iprinit iprupdate iscsid iscsiui kpatch kvm_stat ledmon man-db-restart-cache-update nftables nvme-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-sysextr 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

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# SPEC CPU®2017 Integer Rate Result

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## Bull SAS

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BullSequana SH80 (Intel Xeon Platinum 8490H)

SPECrate®2017\_int\_peak = 2830

**CPU2017 License:** 20

**Test Sponsor:** Bull SAS

**Tested by:** Bull SAS

**Test Date:** Jun-2024

**Hardware Availability:** Jun-2023

**Software Availability:** Dec-2023

### Platform Notes (Continued)

```

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+madvice [madvice] never
enabled         [always] madvice 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

```

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### Platform Notes (Continued)

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 7.3G 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:  
16x Hynix HMC94AEBRA102N 64 GB 2 rank 4800, configured at 4400  
4x Micron MTC40F2046S1RC48BA1 64 GB 2 rank 4800, configured at 4400  
12x Micron MTC40F2046S1RC48BA12 64 GB 2 rank 4800, configured at 4400  
32x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800, configured at 4400

23. BIOS  
(This section combines info from /sys/devices and dmidecode.)  
BIOS Vendor: BULL  
BIOS Version: BIOS\_SAR120.79.01.609  
BIOS Date: 06/04/2024  
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)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
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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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Test Date: Jun-2024

Hardware Availability: Jun-2023

Software Availability: Dec-2023

## Compiler Version Notes (Continued)

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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 -xsaphirerapids -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

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Hardware Availability: Jun-2023

Software Availability: Dec-2023

## Base Optimization Flags (Continued)

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)
-fprofile-use=default.profddata(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
```

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## Peak Optimization Flags (Continued)

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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