



SPEC CPU®2017 Integer Rate Result

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Bull SAS

SPECrate®2017_int_base = 3820

BullSequana SH80 (Intel Xeon Platinum 8490H)

SPECrate®2017_int_peak = 3880

CPU2017 License: 20

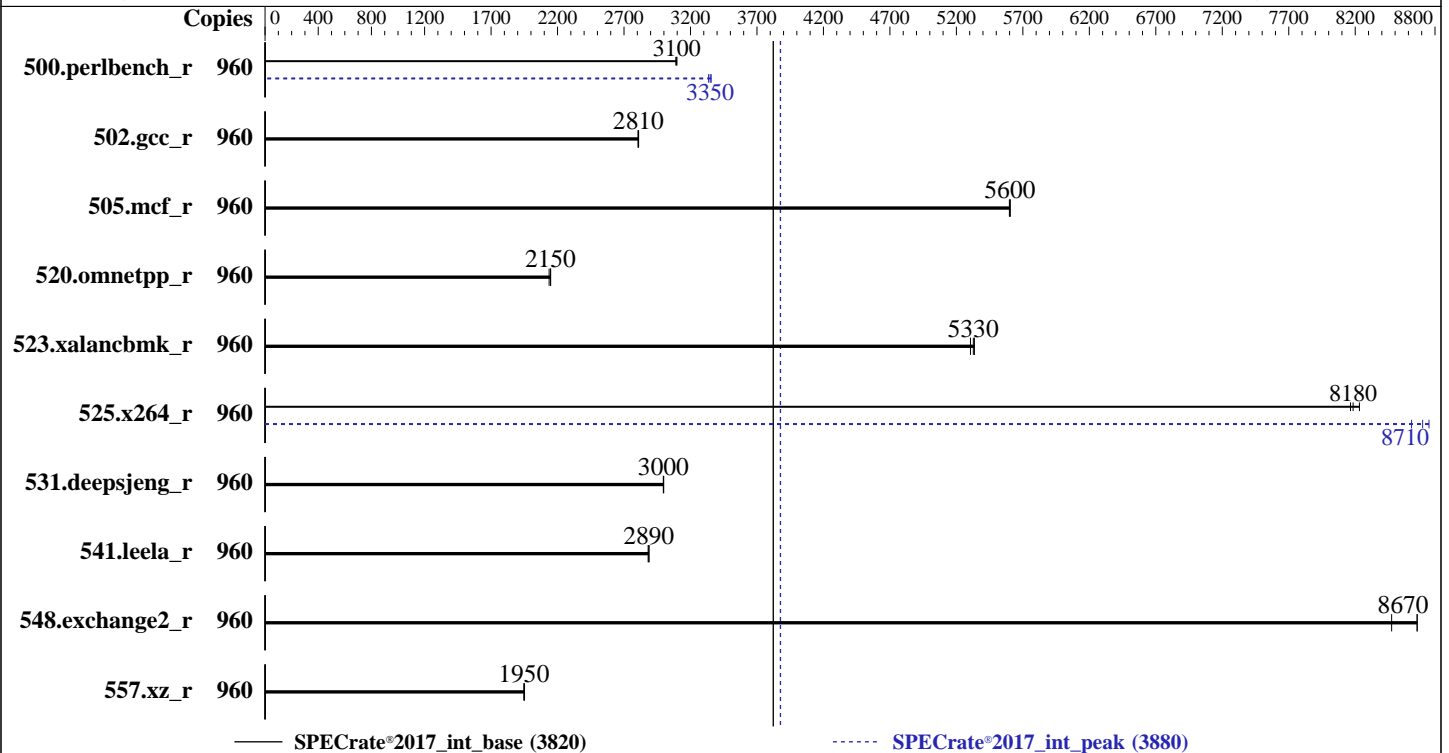
Test Sponsor: Bull SAS

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: 480 cores, 8 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)
 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	960	494	3100	495	3090	494	3100	960	455	3360	456	3350	458	3340
502.gcc_r	960	484	2810	484	2810	485	2810	960	484	2810	484	2810	485	2810
505.mcf_r	960	277	5600	277	5600	277	5600	960	277	5600	277	5600	277	5600
520.omnetpp_r	960	586	2150	587	2150	590	2140	960	586	2150	587	2150	590	2140
523.xalancbmk_r	960	190	5330	190	5340	191	5310	960	190	5330	190	5340	191	5310
525.x264_r	960	205	8180	204	8230	206	8160	960	193	8710	195	8620	192	8750
531.deepsjeng_r	960	367	3000	367	3000	367	3000	960	367	3000	367	3000	367	3000
541.leela_r	960	551	2890	552	2880	551	2890	960	551	2890	552	2880	551	2890
548.exchange2_r	960	290	8670	290	8670	297	8470	960	290	8670	290	8670	297	8470
557.xz_r	960	532	1950	532	1950	531	1950	960	532	1950	532	1950	531	1950

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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:
SNC = Enable SNC4 (4-clusters)

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Platform Notes (Continued)

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
 Patrol Scrub = Disabled
 BMC Configuration:
 FansFullSpeed = True

Sysinfo program /home/spec/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on gaia Sun Jun 2 20:41:01 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
 20:41:02 up 21:36, 1 user, load average: 0.22, 0.21, 0.09
 USER TTY LOGIN@ IDLE JCPU PCPU WHAT
 root pts/0 20:37 38.00s 1.36s 0.15s -bash

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) 16508552
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) 16508552
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 960 --configfile mesca5_8S --define smt-on --define numactl
--define cores=480 --define invoke_with_interleave --define drop_caches --iterations=3 --reportable
--size=ref --tune all -o all intrate
runcpu --define default-platform-flags --copies 960 --configfile mesca5_8S --define smt-on --define numactl
--define cores=480 --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/CPU2017.051/temlogs/preenv.intrate.051.0.log --lognum 051.0
--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
8 physical ids (chips)
960 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
physical id 7: core ids 0-59
physical id 0: apicids 0-119

```

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Platform Notes (Continued)

```

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

```

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):                 960
On-line CPU(s) list:   0-959
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):              8
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_lld arch_capabilities

Virtualization:        VT-x
L1d cache:             22.5 MiB (480 instances)
L1i cache:             15 MiB (480 instances)
L2 cache:              960 MiB (480 instances)
L3 cache:              900 MiB (8 instances)
NUMA node(s):         32
NUMA node0 CPU(s):    0-14,480-494
NUMA node1 CPU(s):    15-29,495-509
NUMA node2 CPU(s):    30-44,510-524

```

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Platform Notes (Continued)

```

NUMA node3 CPU(s):          45-59,525-539
NUMA node4 CPU(s):          60-74,540-554
NUMA node5 CPU(s):          75-89,555-569
NUMA node6 CPU(s):          90-104,570-584
NUMA node7 CPU(s):          105-119,585-599
NUMA node8 CPU(s):          120-134,600-614
NUMA node9 CPU(s):          135-149,615-629
NUMA node10 CPU(s):         150-164,630-644
NUMA node11 CPU(s):         165-179,645-659
NUMA node12 CPU(s):         180-194,660-674
NUMA node13 CPU(s):         195-209,675-689
NUMA node14 CPU(s):         210-224,690-704
NUMA node15 CPU(s):         225-239,705-719
NUMA node16 CPU(s):         240-254,720-734
NUMA node17 CPU(s):         255-269,735-749
NUMA node18 CPU(s):         270-284,750-764
NUMA node19 CPU(s):         285-299,765-779
NUMA node20 CPU(s):         300-314,780-794
NUMA node21 CPU(s):         315-329,795-809
NUMA node22 CPU(s):         330-344,810-824
NUMA node23 CPU(s):         345-359,825-839
NUMA node24 CPU(s):         360-374,840-854
NUMA node25 CPU(s):         375-389,855-869
NUMA node26 CPU(s):         390-404,870-884
NUMA node27 CPU(s):         405-419,885-899
NUMA node28 CPU(s):         420-434,900-914
NUMA node29 CPU(s):         435-449,915-929
NUMA node30 CPU(s):         450-464,930-944
NUMA node31 CPU(s):         465-479,945-959
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/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	22.5M	12	Data	1	64	1	64
L1i	32K	15M	8	Instruction	1	64	1	64
L2	2M	960M	16	Unified	2	2048	1	64
L3	112.5M	900M	15	Unified	3	122880	1	64

8. numactl --hardware

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

```

available: 32 nodes (0-31)
node 0 cpus: 0-14,480-494
node 0 size: 127747 MB
node 0 free: 126454 MB
node 1 cpus: 15-29,495-509
node 1 size: 129017 MB
node 1 free: 128236 MB
node 2 cpus: 30-44,510-524

```

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Platform Notes (Continued)

```

node 2 size: 129017 MB
node 2 free: 128248 MB
node 3 cpus: 45-59,525-539
node 3 size: 129017 MB
node 3 free: 128231 MB
node 4 cpus: 60-74,540-554
node 4 size: 129017 MB
node 4 free: 128320 MB
node 5 cpus: 75-89,555-569
node 5 size: 129017 MB
node 5 free: 128322 MB
node 6 cpus: 90-104,570-584
node 6 size: 129017 MB
node 6 free: 128301 MB
node 7 cpus: 105-119,585-599
node 7 size: 129017 MB
node 7 free: 128289 MB
node 8 cpus: 120-134,600-614
node 8 size: 129017 MB
node 8 free: 128290 MB
node 9 cpus: 135-149,615-629
node 9 size: 129017 MB
node 9 free: 128306 MB
node 10 cpus: 150-164,630-644
node 10 size: 129017 MB
node 10 free: 128178 MB
node 11 cpus: 165-179,645-659
node 11 size: 129017 MB
node 11 free: 128316 MB
node 12 cpus: 180-194,660-674
node 12 size: 129017 MB
node 12 free: 128293 MB
node 13 cpus: 195-209,675-689
node 13 size: 129017 MB
node 13 free: 128305 MB
node 14 cpus: 210-224,690-704
node 14 size: 129017 MB
node 14 free: 128319 MB
node 15 cpus: 225-239,705-719
node 15 size: 129017 MB
node 15 free: 128327 MB
node 16 cpus: 240-254,720-734
node 16 size: 129017 MB
node 16 free: 128327 MB
node 17 cpus: 255-269,735-749
node 17 size: 129017 MB
node 17 free: 128333 MB
node 18 cpus: 270-284,750-764
node 18 size: 129017 MB
node 18 free: 128317 MB
node 19 cpus: 285-299,765-779
node 19 size: 129017 MB
node 19 free: 128314 MB
node 20 cpus: 300-314,780-794
node 20 size: 129017 MB
node 20 free: 128301 MB
node 21 cpus: 315-329,795-809
node 21 size: 129017 MB
node 21 free: 128313 MB
node 22 cpus: 330-344,810-824

```

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Platform Notes (Continued)

```

node 22 size: 129017 MB
node 22 free: 128225 MB
node 23 cpus: 345-359,825-839
node 23 size: 129017 MB
node 23 free: 128128 MB
node 24 cpus: 360-374,840-854
node 24 size: 129017 MB
node 24 free: 128326 MB
node 25 cpus: 375-389,855-869
node 25 size: 129017 MB
node 25 free: 128329 MB
node 26 cpus: 390-404,870-884
node 26 size: 129017 MB
node 26 free: 127655 MB
node 27 cpus: 405-419,885-899
node 27 size: 129017 MB
node 27 free: 128337 MB
node 28 cpus: 420-434,900-914
node 28 size: 129017 MB
node 28 free: 128275 MB
node 29 cpus: 435-449,915-929
node 29 size: 128978 MB
node 29 free: 128278 MB
node 30 cpus: 450-464,930-944
node 30 size: 129017 MB
node 30 free: 128276 MB
node 31 cpus: 465-479,945-959
node 31 size: 128973 MB
node 31 free: 128178 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 24
25 26 27 28 29 30 31
0: 10 12 12 12 12 21 21 21 21 21 21 31 31 31 31 31 31 31 31 21 21 21 21 21
21 21 21 31 31 31 31
1: 12 10 12 12 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21
21 21 21 31 31 31 31
2: 12 12 10 12 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21
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7: 21 21 21 21 12 12 12 12 10 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31
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8: 21 21 21 21 31 31 31 31 10 12 12 12 21 21 21 21 21 21 21 31 31 31 31 31
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9: 21 21 21 21 31 31 31 31 12 10 12 12 21 21 21 21 21 21 21 31 31 31 31 31
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10: 21 21 21 21 31 31 31 31 12 12 10 12 21 21 21 21 21 21 21 31 31 31 31 31
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11: 21 21 21 21 31 31 31 31 12 12 12 10 21 21 21 21 21 21 21 31 31 31 31 31
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12: 31 31 31 31 21 21 21 21 21 21 21 10 12 12 12 31 31 31 31 21 21 21 21 21
21 21 21 31 31 31
13: 31 31 31 31 21 21 21 21 21 21 21 12 10 12 12 31 31 31 31 21 21 21 21 21
21 21 21 31 31 31

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```

14: 31 31 31 31 21 21 21 21 21 21 21 12 12 10 12 31 31 31 31 21 21 21 21 21
21 21 21 31 31 31 31
15: 31 31 31 31 21 21 21 21 21 21 21 12 12 12 10 31 31 31 31 21 21 21 21 21
21 21 21 31 31 31 31
16: 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 10 12 12 12 21 21 21 21 21
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18: 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 12 12 10 12 21 21 21 21 21
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19: 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 12 12 12 10 21 21 21 21 21
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20: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 10 12 12 12 31
31 31 31 21 21 21
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23: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 12 12 12 10 31
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24: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 10
12 12 12 21 21 21
25: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 12
10 12 12 21 21 21
26: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 12
12 10 12 21 21 21
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28: 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21
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30: 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21
21 21 21 12 12 10 12
31: 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21
21 21 21 12 12 12 10

```

```

-----
9. /proc/meminfo
MemTotal: 4226254016 kB

```

```

-----
10. who -r
run-level 5 Jun 1 23:07

```

```

-----
11. Systemd service manager version: systemd 252 (252-13.e19_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
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

```

(Continued on next page)



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Platform Notes (Continued)

```

enabled-runtime systemd-remount-fs
disabled arp-ethers blk-availability brltyt 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 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
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

```

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Platform Notes (Continued)

```

vm.watermark_scale_factor      10
vm.zone_reclaim_mode          0

```

```

-----
17. /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

```

```

-----
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  7.2G  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
 22x Micron MTC40F2046S1RC48BA1 64 GB 2 rank 4800
 26x 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

```



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Software Availability: Dec-2023

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.
-----

```

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

```



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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
-lqkmallo
```

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
-lqkmallo
```

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
-lqkmallo
```

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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