SPEC CPU®2017 Integer Rate Result

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Bull SAS

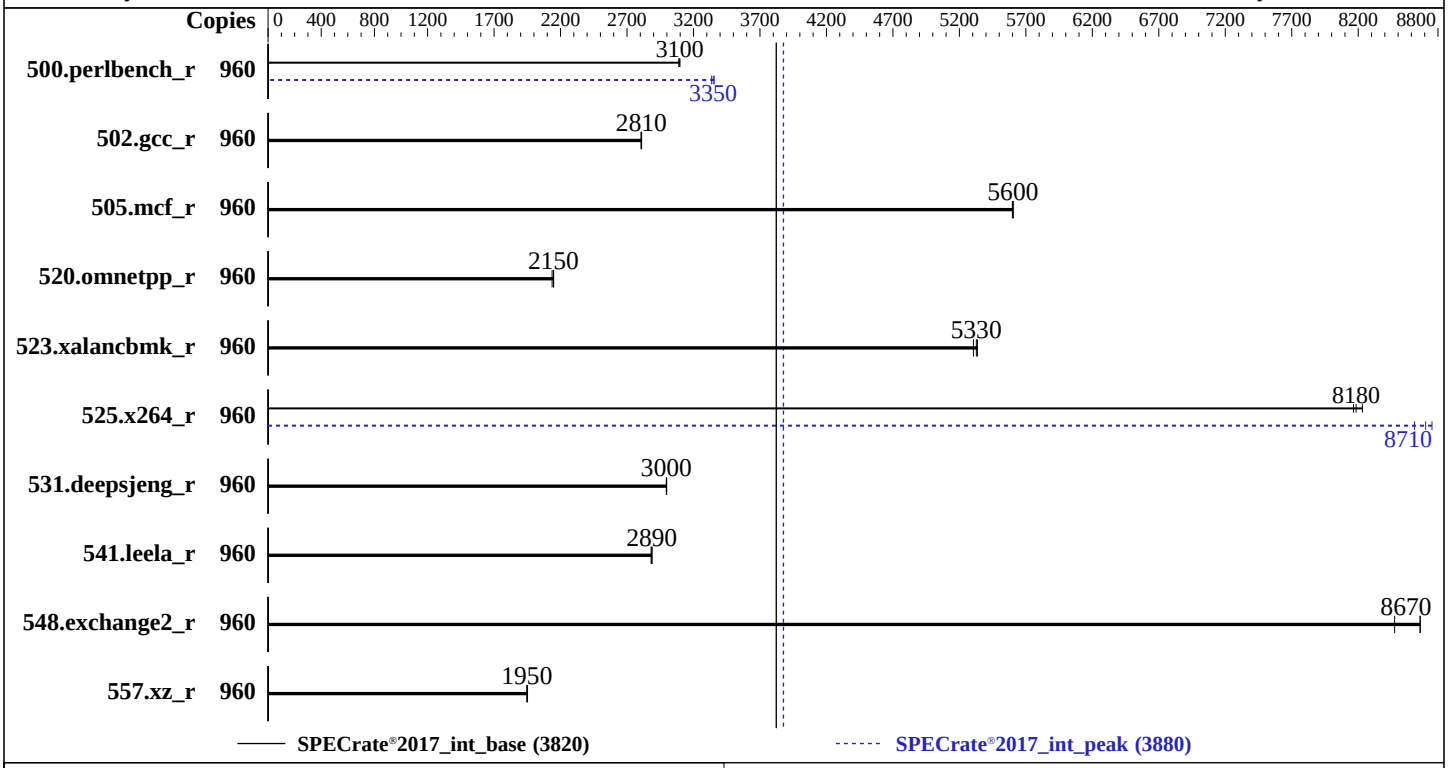
BullSequana SH80 (Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 3820

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

SPECrate®2017_int_base = **3820**

SPECrate®2017_int_peak = **3880**

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)
```

(Continued on next page)

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/templogs/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
```

(Continued on next page)

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_l1d 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/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    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  21  21  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  21  31  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  21  31  31  31  31  31  31  31  31  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  31  31  31  31  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  21  21  21  21  31  31  31  31  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  21  21  21  21  31  31  31  31  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  21  21  21  21  31  31  31  31  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  21  21  21  21  31  31  31  31  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  21  21  21  21  31  31  31  31  31
  31  31  31  21  21  21  21
  9:  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31
  31  31  31  21  21  21  21
 10:  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21  21  21  21  31  31  31  31  31
 31  31  31  21  21  21  21
 11:  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21  21  21  21  31  31  31  31  31
 31  31  31  21  21  21  21
 12:  31  31  31  31  21  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  31
 13:  31  31  31  31  21  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  31
```

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Platform Notes (Continued)

```
   14:  31  31  31  31  21  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  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  21  31  31  31  31  10  12  12  12  21  21  21  21  21
   21  21  21  31  31  31  31
   17:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21
   21  21  21  31  31  31  31
   18:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21
   21  21  21  31  31  31  31
   19:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21
   21  21  21  31  31  31  31
   20:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  10  12  12  12  31
   31  31  31  21  21  21  21
   21:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  10  12  12  31
   31  31  31  21  21  21  21
   22:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  12  10  12  31
   31  31  31  21  21  21  21
   23:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  12  12  10  31
   31  31  31  21  21  21  21
   24:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  10
   12  12  12  21  21  21  21
   25:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
   10  12  12  21  21  21  21
   26:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
   12  10  12  21  21  21  21
   27:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
   12  12  10  21  21  21  21
   28:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
   21  21  21  10  12  12  12
   29:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
   21  21  21  12  10  12  12
   30:  31  31  31  31  21  21  21  21  21  21  21  21  31  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  21  31  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.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
```

(Continued on next page)

Platform Notes (Continued)

```
  enabled-runtime  systemd-remount-fs
  disabled         arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown
                   canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed
                   dbus-daemon debug-shell dnf-system-upgrade dnsmasq iprdump iprinit iprupdate iscsid
                   iscsiuio kpatch kvm_stat ledmon man-db-restart-cache-update nftables nvmf-autoconnect
                   ostree-readonly-sysroot-migration podman podman-auto-update podman-clean-transient
                   podman-kube@ podman-restart psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts
                   rpmdb-rebuild selinux-check-proper-disable speech-dispatcherd sshd-keygen@
                   systemd-boot-check-no-failures systemd-pstore systemd-sysext wpa_supplicant
  indirect         serial-getty@ spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh
                   sssd-sudo systemd-sysupdate systemd-sysupdate-reboot

------------------------------------------------------------
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
```

(Continued on next page)

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 HMCG94AEBRA102N 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
```

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

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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