



SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMERGY RX8770 M7, Intel Xeon Platinum 8468H, 2.10GHz

SPECrate®2017_int_base = 3080

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

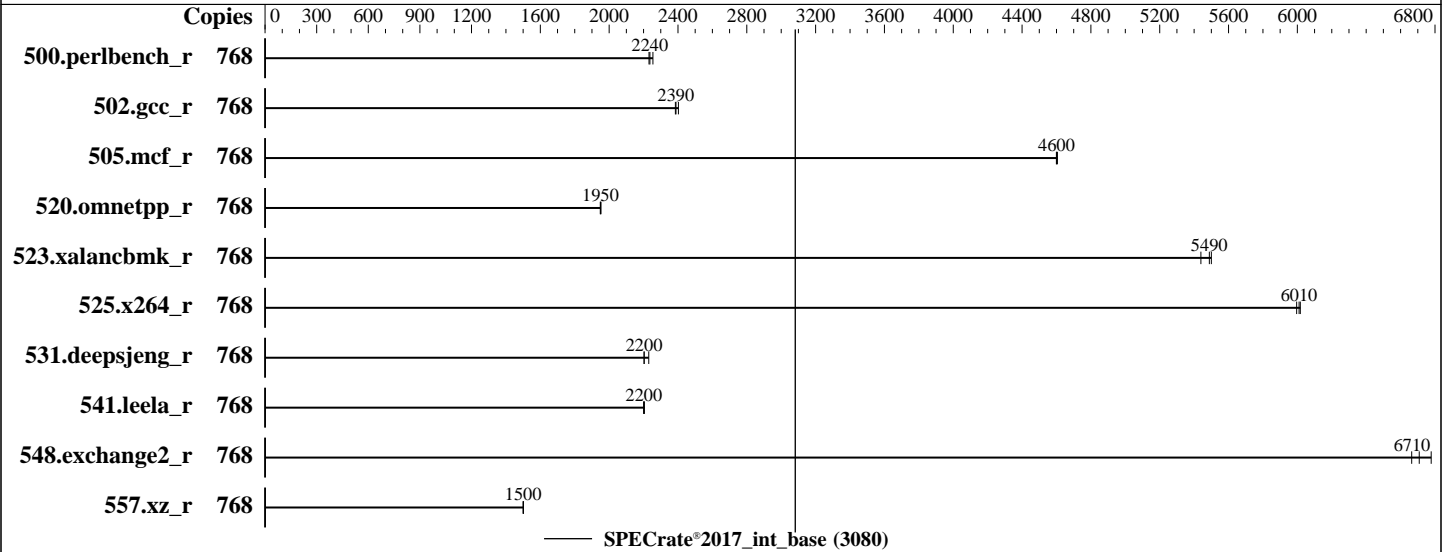
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: May-2023

Hardware Availability: Jun-2023

Software Availability: Dec-2022



Hardware

CPU Name: Intel Xeon Platinum 8468H
 Max MHz: 3800
 Nominal: 2100
 Enabled: 384 cores, 8 chips, 2 threads/core
 Orderable: 8 chips
 Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 105 MB I+D on chip per chip
 Other: None
 Memory: 4 TB (64 x 64 GB 2Rx4 PC5-4800B-R)
 Storage: 1 x SATA SSD, 3.84TB
 Other: 1 x Fujitsu PRAID EP740i Raid Card

Software

OS: SUSE Linux Enterprise Server 15 SP4
 5.14.21-150400.22-default
 Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
 Parallel: No
 Firmware: Fujitsu BIOS Version V1.0.0.0 R1.2.0 for D4029-C1x. Released Jun-2023
 tested as V1.0.0.0 R0.11.0 for D4029-C1x Feb-2023
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: None
 Power Management: BIOS 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	768	542	2250	548	2230	547	2240							
502.gcc_r	768	453	2400	455	2390	456	2380							
505.mcf_r	768	270	4600	270	4600	269	4610							
520.omnetpp_r	768	516	1950	517	1950	517	1950							
523.xalancbmk_r	768	148	5490	149	5440	147	5500							
525.x264_r	768	224	6000	224	6010	223	6020							
531.deepsjeng_r	768	400	2200	395	2230	399	2200							
541.leela_r	768	578	2200	577	2200	577	2200							
548.exchange2_r	768	300	6710	297	6780	302	6660							
557.xz_r	768	553	1500	552	1500	553	1500							

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

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/benchmark/speccpu/lib/intel64:/home/benchmark/speccpu/lib/ia32:/home/benchmark/speccpu/je5.0.1-32"
MALLOC_CONF = "retain:true"
```



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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>`
 NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
 Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
 Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Platform Notes

BIOS configuration:
 DCU Streamer Prefetcher = Disabled
 Adjacent Cache Line Prefetch = Disabled
 CPU CLE Support = Disabled
 SNC (Sub NUMA) = Enable SNC4
 LLC Dead Line Alloc = Disabled
 FAN Control = Full

Sysinfo program /home/benchmark/speccpu/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Wed May 17 15:08:35 2023

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 249 (249.11+suse.124.g2bc0b2c447)`
12. Failed units, from `systemctl list-units --state=failed`
13. Services, from `systemctl list-unit-files`
14. Linux kernel boot-time arguments, from `/proc/cmdline`
15. `cpupower frequency-info`
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

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Platform Notes (Continued)

1. `uname -a`
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux
2. `w`
15:08:36 up 5 min, 2 users, load average: 12.02, 33.88, 17.89
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 15:06 1:59 0.06s 0.06s -bash
root pts/0 192.168.1.114 15:06 11.00s 3.32s 0.38s
/home/benchmark/ptu_v4.0/UNIFIED_SERVER_PTAT_V4.0.0_20230110/ptat -mon -i 5000000 -filter 0x3f -y -ts -csv -log
3. Username
From environment variable \$USER: root
4. `ulimit -a`
core file size (blocks, -c) unlimited
data seg size (kbytes, -d) unlimited
scheduling priority (-e) 0
file size (blocks, -f) unlimited
pending signals (-i) 16509721
max locked memory (kbytes, -l) 64
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) 16509721
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited
5. `sysinfo process ancestry`
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root@pts/0
-bash
-bash
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=768 -c
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=384 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base -o all intrate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=768 --configfile
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=384 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
rate --tune base --size refrate intrate --nopreenv --note-preenv --logfile
\$SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
specperl \$SPEC/bin/sysinfo
\$SPEC = /home/benchmark/speccpu
6. `/proc/cpuinfo`
model name : Intel(R) Xeon(R) Platinum 8468H
vendor_id : GenuineIntel
cpu family : 6

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Platform Notes (Continued)

```

model          : 143
stepping       : 6
microcode      : 0x2b000161
bugs           : spectre_v1 spectre_v2 spec_store_bypass swappg
cpu cores      : 48
siblings       : 96
8 physical ids (chips)
768 processors (hardware threads)
physical id 0: core ids 0-47
physical id 1: core ids 0-47
physical id 2: core ids 0-47
physical id 3: core ids 0-47
physical id 4: core ids 0-47
physical id 5: core ids 0-47
physical id 6: core ids 0-47
physical id 7: core ids 0-47
physical id 0: apicids 0-95
physical id 1: apicids 128-223
physical id 2: apicids 256-351
physical id 3: apicids 384-479
physical id 4: apicids 512-607
physical id 5: apicids 640-735
physical id 6: apicids 768-863
physical id 7: apicids 896-991

```

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 2.37.2:

```

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):                768
On-line CPU(s) list:   0-767
Vendor ID:             GenuineIntel
Model name:            Intel(R) Xeon(R) Platinum 8468H
CPU family:            6
Model:                 143
Thread(s) per core:    2
Core(s) per socket:    48
Socket(s):             8
Stepping:              6
CPU max MHz:           3800.0000
CPU min MHz:           800.0000
BogoMIPS:              4200.00
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 aperfperf 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 hle
                        avx2 smep bmi2 erms invpcid rtm 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

```

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Platform Notes (Continued)

cpm_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 avx512_fp16 amx_tile flush_llid arch_capabilities

Virtualization:

L1d cache: 18 MiB (384 instances)
L1i cache: 12 MiB (384 instances)
L2 cache: 768 MiB (384 instances)
L3 cache: 840 MiB (8 instances)

NUMA node(s):

32
NUMA node0 CPU(s): 0-11,384-395
NUMA node1 CPU(s): 12-23,396-407
NUMA node2 CPU(s): 24-35,408-419
NUMA node3 CPU(s): 36-47,420-431
NUMA node4 CPU(s): 48-59,432-443
NUMA node5 CPU(s): 60-71,444-455
NUMA node6 CPU(s): 72-83,456-467
NUMA node7 CPU(s): 84-95,468-479
NUMA node8 CPU(s): 96-107,480-491
NUMA node9 CPU(s): 108-119,492-503
NUMA node10 CPU(s): 120-131,504-515
NUMA node11 CPU(s): 132-143,516-527
NUMA node12 CPU(s): 144-155,528-539
NUMA node13 CPU(s): 156-167,540-551
NUMA node14 CPU(s): 168-179,552-563
NUMA node15 CPU(s): 180-191,564-575
NUMA node16 CPU(s): 192-203,576-587
NUMA node17 CPU(s): 204-215,588-599
NUMA node18 CPU(s): 216-227,600-611
NUMA node19 CPU(s): 228-239,612-623
NUMA node20 CPU(s): 240-251,624-635
NUMA node21 CPU(s): 252-263,636-647
NUMA node22 CPU(s): 264-275,648-659
NUMA node23 CPU(s): 276-287,660-671
NUMA node24 CPU(s): 288-299,672-683
NUMA node25 CPU(s): 300-311,684-695
NUMA node26 CPU(s): 312-323,696-707
NUMA node27 CPU(s): 324-335,708-719
NUMA node28 CPU(s): 336-347,720-731
NUMA node29 CPU(s): 348-359,732-743
NUMA node30 CPU(s): 360-371,744-755
NUMA node31 CPU(s): 372-383,756-767

Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
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	18M	12	Data	1	64	1	64
L1i	32K	12M	8	Instruction	1	64	1	64
L2	2M	768M	16	Unified	2	2048	1	64
L3	105M	840M	15	Unified	3	114688	1	64

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Platform Notes (Continued)

8. numactl --hardware

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

```

available: 32 nodes (0-31)
node 0 cpus: 0-11,384-395
node 0 size: 128466 MB
node 0 free: 126026 MB
node 1 cpus: 12-23,396-407
node 1 size: 129017 MB
node 1 free: 127603 MB
node 2 cpus: 24-35,408-419
node 2 size: 129017 MB
node 2 free: 127666 MB
node 3 cpus: 36-47,420-431
node 3 size: 128983 MB
node 3 free: 127442 MB
node 4 cpus: 48-59,432-443
node 4 size: 129017 MB
node 4 free: 128583 MB
node 5 cpus: 60-71,444-455
node 5 size: 129017 MB
node 5 free: 128636 MB
node 6 cpus: 72-83,456-467
node 6 size: 129017 MB
node 6 free: 128687 MB
node 7 cpus: 84-95,468-479
node 7 size: 129017 MB
node 7 free: 128665 MB
node 8 cpus: 96-107,480-491
node 8 size: 129017 MB
node 8 free: 128653 MB
node 9 cpus: 108-119,492-503
node 9 size: 129017 MB
node 9 free: 128642 MB
node 10 cpus: 120-131,504-515
node 10 size: 129017 MB
node 10 free: 128629 MB
node 11 cpus: 132-143,516-527
node 11 size: 129017 MB
node 11 free: 128629 MB
node 12 cpus: 144-155,528-539
node 12 size: 129017 MB
node 12 free: 128742 MB
node 13 cpus: 156-167,540-551
node 13 size: 129017 MB
node 13 free: 128810 MB
node 14 cpus: 168-179,552-563
node 14 size: 129017 MB
node 14 free: 128804 MB
node 15 cpus: 180-191,564-575
node 15 size: 129017 MB
node 15 free: 128801 MB
node 16 cpus: 192-203,576-587
node 16 size: 129017 MB
node 16 free: 128817 MB
node 17 cpus: 204-215,588-599
node 17 size: 129017 MB
node 17 free: 128764 MB
node 18 cpus: 216-227,600-611

```

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Platform Notes (Continued)

```

node 18 size: 129017 MB
node 18 free: 128818 MB
node 19 cpus: 228-239,612-623
node 19 size: 129017 MB
node 19 free: 128804 MB
node 20 cpus: 240-251,624-635
node 20 size: 129017 MB
node 20 free: 128619 MB
node 21 cpus: 252-263,636-647
node 21 size: 129017 MB
node 21 free: 128653 MB
node 22 cpus: 264-275,648-659
node 22 size: 129017 MB
node 22 free: 128620 MB
node 23 cpus: 276-287,660-671
node 23 size: 129017 MB
node 23 free: 128647 MB
node 24 cpus: 288-299,672-683
node 24 size: 129017 MB
node 24 free: 128654 MB
node 25 cpus: 300-311,684-695
node 25 size: 129017 MB
node 25 free: 128625 MB
node 26 cpus: 312-323,696-707
node 26 size: 129017 MB
node 26 free: 128648 MB
node 27 cpus: 324-335,708-719
node 27 size: 129017 MB
node 27 free: 128701 MB
node 28 cpus: 336-347,720-731
node 28 size: 129017 MB
node 28 free: 128705 MB
node 29 cpus: 348-359,732-743
node 29 size: 129017 MB
node 29 free: 128804 MB
node 30 cpus: 360-371,744-755
node 30 size: 129017 MB
node 30 free: 128765 MB
node 31 cpus: 372-383,756-767
node 31 size: 128487 MB
node 31 free: 128258 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
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	31	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																			

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Platform Notes (Continued)

```

8:  21  21  21  21  21  31  31  31  31  10  12  12  12  21  21  21  21  21  21  21  31  31  31  31  31
31  31  31  21  21  21  21
9:  21  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21  21  21  31  31  31  31  31
31  31  31  21  21  21  21
10: 21  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21  21  21  31  31  31  31  31
31  31  31  21  21  21  21
11: 21  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21  21  21  31  31  31  31  31
31  31  31  21  21  21  21
12: 31  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  31
13: 31  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  31
14: 31  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  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  31  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  31  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  31  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  31  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  21  31  31  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  21  21  31  31  31  31  31  31  21  21  21  21  21  21  21  12  10  12  12  31
31  31  31  21  21  21  21
22: 21  21  21  21  21  31  31  31  31  31  31  21  21  21  21  21  21  21  12  12  10  12  31
31  31  31  21  21  21  21
23: 21  21  21  21  21  31  31  31  31  31  31  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  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  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  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  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  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  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  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  31  31  31  31  31  31  31  21  21  21  21  21
21  21  21  12  12  12  10

```

```

-----
9. /proc/meminfo
   MemTotal:      4226514292 kB

```

```

-----
10. who -r
    run-level 3 May 17 15:05

```

```

-----
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
    Default Target Status

```

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Test Date: May-2023
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Software Availability: Dec-2022

Platform Notes (Continued)

multi-user degraded

12. Failed units, from systemctl list-units --state=failed

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
* sep5.service	loaded	failed	failed	systemd script to load sep5 driver at boot time
* smartd.service	loaded	failed	failed	Self Monitoring and Reporting Technology (SMART) Daemon
* systemd-udev-settle.service	loaded	failed	failed	Wait for udev To Complete Device Initialization

13. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron display-manager getty@ havedged irqbalance iscsi issue-generator kbdsettings kdump kdump-early klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog sep5 smartd sshd wickedd wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime	systemd-remount-fs
disabled	accounts-daemon appstream appstream-sync-cache autofs autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info firewallld gpm grub2-once havedged-switch-root ipmi ipmievd iscsi-init iscsid iscsiui issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb ostree-remount rdisc rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd udisks2 upower
indirect	wickedd

14. Linux kernel boot-time arguments, from /proc/cmdline

```
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=c13187e0-8b8c-4db9-ba32-defae6232c
splash=silent
mitigations=auto
quiet
security=apparmor
crashkernel=375M,high
crashkernel=72M,low
```

15. cpupower frequency-info

```
analyzing CPU 0:
  current policy: frequency should be within 800 MHz and 3.80 GHz.
                  The governor "powersave" may decide which speed to use
                  within this range.

  boost state support:
    Supported: yes
    Active: yes
```

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	20
vm.dirty_writeback_centisecs	500
vm.dirtytime_expire_seconds	43200

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Platform Notes (Continued)

```

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                 60
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
pages_to_scan          4096
scan_sleep_millisecs  10000

```

```

-----
19. OS release
From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP4

```

```

-----
20. Disk information
SPEC is set to: /home/benchmark/speccpu
Filesystem  Type  Size  Used Avail Use% Mounted on
/dev/sdb2   xfs   3.5T  46G  3.5T   2% /

```

```

-----
21. /sys/devices/virtual/dmi/id
Vendor:      FUJITSU
Product:     n/a
Product Family: SERVER
Serial:      n/a

```

```

-----
22. dmidecode
Additional information from dmidecode 3.2 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:
  7x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800
 31x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800
 26x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800

```

```

-----
23. BIOS
(This section combines info from /sys/devices and dmidecode.)

```

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Software Availability: Dec-2022

Platform Notes (Continued)

BIOS Vendor: FUJITSU
BIOS Version: V1.0.0.0 R0.11.0 for D4029-Clx
BIOS Date: 02/28/2023
BIOS Revision: 0.11
Firmware Revision: 2.0

Compiler Version Notes

=====
C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)
=====

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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=====

=====
C++ | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
=====

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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=====

=====
Fortran | 548.exchange2_r(base)
=====

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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

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Base Portability Flags (Continued)

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/usr/local/intel/compiler/2023.0.0/linux/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/usr/local/intel/compiler/2023.0.0/linux/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/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmallo
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-SPR-RevB.html>
<http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-SPR-RevB.xml>
<http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml>

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