



SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMERGY RX8770 M7, Intel Xeon Platinum 8490H, 1.90GHz

SPECrate®2017_int_base = 3590

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

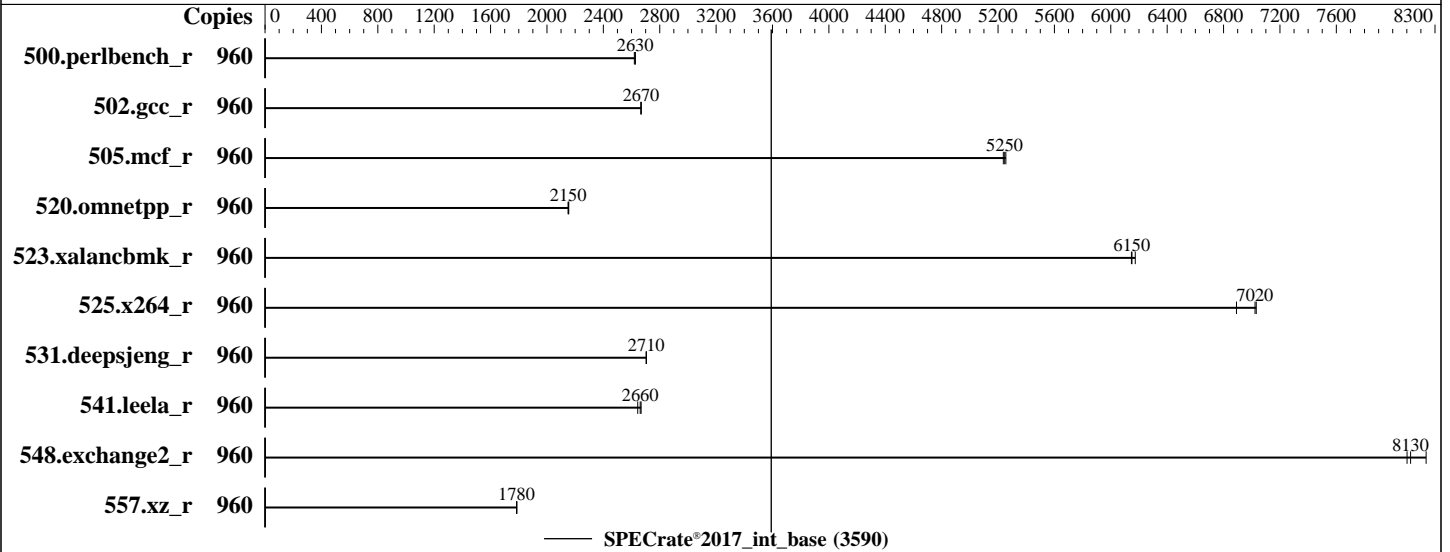
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Apr-2023

Hardware Availability: Jun-2023

Software Availability: Dec-2022



Hardware

CPU Name: Intel Xeon Platinum 8490H
 Max MHz: 3500
 Nominal: 1900
 Enabled: 480 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: 112.5 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, 1.92TB
 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	960	583	2620	582	2630	582	2630							
502.gcc_r	960	510	2670	510	2670	509	2670							
505.mcf_r	960	295	5260	296	5240	296	5250							
520.omnetpp_r	960	585	2150	586	2150	586	2150							
523.xalancbmk_r	960	164	6170	165	6150	165	6150							
525.x264_r	960	239	7030	244	6890	239	7020							
531.deepsjeng_r	960	407	2710	407	2710	407	2700							
541.leela_r	960	597	2660	596	2670	601	2640							
548.exchange2_r	960	310	8100	305	8240	309	8130							
557.xz_r	960	581	1780	581	1780	580	1790							

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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 Tue Apr 11 11:19:24 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

(Continued on next page)



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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
11:19:24 up 6 min, 2 users, load average: 24.66, 90.11, 50.84
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 11:18 1:21 0.06s 0.06s -bash
root pts/0 192.168.1.114 11:18 12.00s 2.62s 0.70s -bash

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) 16509565
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) 16509565
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=960 -c
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=480 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base -o all intrate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=960 --configfile
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=480 --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 8490H
vendor_id : GenuineIntel
cpu family : 6
model : 143
stepping : 8

```

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### Platform Notes (Continued)

```

microcode : 0x2b000161
bugs : spectre_v1 spectre_v2 spec_store_bypass swapgs
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
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 2.37.2:

```

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): 960
On-line CPU(s) list: 0-959
Vendor ID: GenuineIntel
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 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
 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

```

(Continued on next page)



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### Platform Notes (Continued)

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\_lld arch\_capabilities

**Virtualization:**

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  
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 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      | 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             |

(Continued on next page)



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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: 0-14,480-494
node 0 size: 128466 MB
node 0 free: 125622 MB
node 1 cpus: 15-29,495-509
node 1 size: 129016 MB
node 1 free: 127831 MB
node 2 cpus: 30-44,510-524
node 2 size: 129016 MB
node 2 free: 127953 MB
node 3 cpus: 45-59,525-539
node 3 size: 129016 MB
node 3 free: 128037 MB
node 4 cpus: 60-74,540-554
node 4 size: 129016 MB
node 4 free: 128713 MB
node 5 cpus: 75-89,555-569
node 5 size: 129016 MB
node 5 free: 128777 MB
node 6 cpus: 90-104,570-584
node 6 size: 129016 MB
node 6 free: 128674 MB
node 7 cpus: 105-119,585-599
node 7 size: 129016 MB
node 7 free: 128764 MB
node 8 cpus: 120-134,600-614
node 8 size: 129016 MB
node 8 free: 128716 MB
node 9 cpus: 135-149,615-629
node 9 size: 129016 MB
node 9 free: 128693 MB
node 10 cpus: 150-164,630-644
node 10 size: 129016 MB
node 10 free: 128785 MB
node 11 cpus: 165-179,645-659
node 11 size: 129016 MB
node 11 free: 128758 MB
node 12 cpus: 180-194,660-674
node 12 size: 129016 MB
node 12 free: 128810 MB
node 13 cpus: 195-209,675-689
node 13 size: 129016 MB
node 13 free: 128838 MB
node 14 cpus: 210-224,690-704
node 14 size: 129016 MB
node 14 free: 128834 MB
node 15 cpus: 225-239,705-719
node 15 size: 129016 MB
node 15 free: 128831 MB
node 16 cpus: 240-254,720-734
node 16 size: 129016 MB
node 16 free: 128832 MB
node 17 cpus: 255-269,735-749
node 17 size: 129016 MB
node 17 free: 128800 MB
node 18 cpus: 270-284,750-764
node 18 size: 129016 MB
node 18 free: 128848 MB

```

(Continued on next page)



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```

node 19 cpus: 285-299,765-779
node 19 size: 129016 MB
node 19 free: 128820 MB
node 20 cpus: 300-314,780-794
node 20 size: 129016 MB
node 20 free: 128693 MB
node 21 cpus: 315-329,795-809
node 21 size: 129016 MB
node 21 free: 128755 MB
node 22 cpus: 330-344,810-824
node 22 size: 129016 MB
node 22 free: 128784 MB
node 23 cpus: 345-359,825-839
node 23 size: 129016 MB
node 23 free: 128676 MB
node 24 cpus: 360-374,840-854
node 24 size: 129016 MB
node 24 free: 128750 MB
node 25 cpus: 375-389,855-869
node 25 size: 129016 MB
node 25 free: 128641 MB
node 26 cpus: 390-404,870-884
node 26 size: 129016 MB
node 26 free: 128773 MB
node 27 cpus: 405-419,885-899
node 27 size: 129016 MB
node 27 free: 128746 MB
node 28 cpus: 420-434,900-914
node 28 size: 128981 MB
node 28 free: 128803 MB
node 29 cpus: 435-449,915-929
node 29 size: 129016 MB
node 29 free: 128853 MB
node 30 cpus: 450-464,930-944
node 30 size: 129016 MB
node 30 free: 128857 MB
node 31 cpus: 465-479,945-959
node 31 size: 128493 MB
node 31 free: 128279 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 21 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
21 21 21 31 31 31 31
3: 12 12 12 10 21 21 21 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21
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4: 21 21 21 21 10 12 12 12 31 31 31 31 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 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 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 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 31 31 31 31 31
31 31 31 21 21 21 21

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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
31 31 31 21 21 21 21
10: 21 21 21 21 21 31 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 31 21 21 21 21 21
21 21 21 12 12 12 10

```

```

9. /proc/meminfo
 MemTotal: 4226473808 kB

```

```

10. who -r
 run-level 3 Apr 11 11:16

```

```

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

```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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## Fujitsu

PRIMERGY RX8770 M7, Intel Xeon Platinum 8490H, 1.90GHz

SPECrate®2017\_int\_base = 3590

SPECrate®2017\_int\_peak = Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Apr-2023

Hardware Availability: Jun-2023

Software Availability: Dec-2022

### Platform Notes (Continued)

-----  
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 |
| * 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@ haveged irqbalance iscsi issue-generator kbdsettings kdump kdump-early klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog sep5 smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny                                                                                                                                                                                                                                                                                                                                                               |
| enabled-runtime | systemd-remount-fs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| disabled        | accounts-daemon 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 firewalld gpm grub2-once haveged-switch-root ipmi ipmievd iscsi-init iscsid iscsiio 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=6efa90aa-3ef9-440b-aa41-ad395a2ae50d
splash=silent
mitigations=auto
quiet
security=apparmor
crashkernel=368M,high
crashkernel=72M,low

```

-----  
15. `cpupower frequency-info`

```

analyzing CPU 0:
 current policy: frequency should be within 800 MHz and 3.50 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 |
| vm.extfrag_threshold         | 500   |
| vm.min_unmapped_ratio        | 1     |
| vm.nr_hugepages              | 0     |

(Continued on next page)



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### Platform Notes (Continued)

```

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+advise [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 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/sda2 xfs 1.8T 58G 1.7T 4% /

```

```

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.)
BIOS Vendor: FUJITSU
BIOS Version: V1.0.0.0 R0.11.0 for D4029-C1x
BIOS Date: 02/28/2023

```

(Continued on next page)



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## Platform Notes (Continued)

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  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
=====

=====  
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  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
=====

=====  
Fortran | 548.exchange2\_r(base)  
=====

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201  
Copyright (C) 1985-2022 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

(Continued on next page)



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**Software Availability:** Dec-2022

## Base Portability Flags (Continued)

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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Tested with SPEC CPU®2017 v1.1.9 on 2023-04-10 22:19:23-0400.  
Report generated on 2024-01-29 17:41:21 by CPU2017 PDF formatter v6716.  
Originally published on 2023-05-09.