



# SPEC CPU®2017 Integer Rate Result

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Inspur Electronic Information Industry Co., Ltd.  
(IEI)

SPECrate®2017\_int\_base = 3700

TS860G7 (Intel Xeon Platinum 8490H)

SPECrate®2017\_int\_peak = 3750

CPU2017 License: 3358

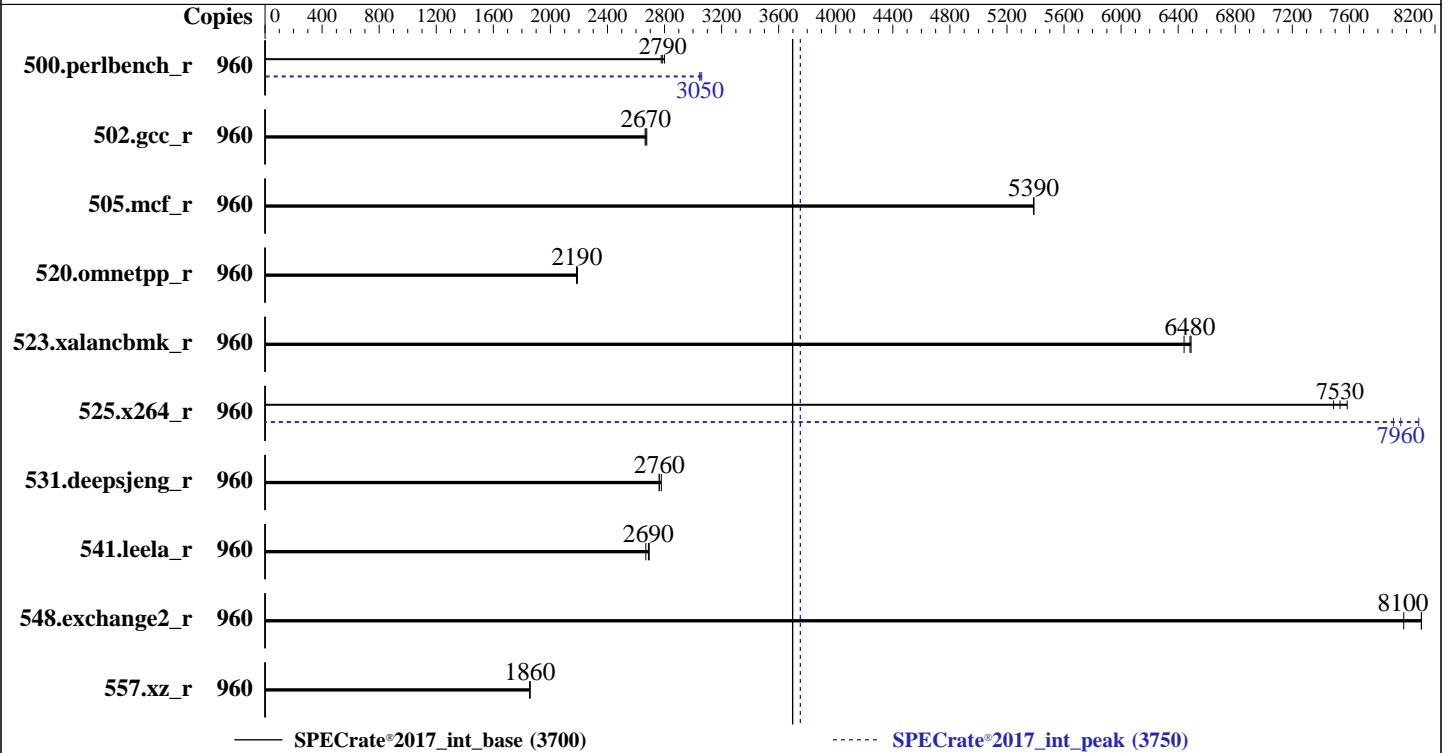
Test Date: May-2023

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Hardware Availability: Jul-2023

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

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: 2,4,8 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: 2 TB (64 x 32 GB 2Rx4 PC5-4800B-R)  
 Storage: 1 x 3.2 TB NVME SSD  
 Other: None

### Software

OS: Red Hat Enterprise Linux 9.0 (Plow)  
 5.14.0-70.22.1.el9\_0.x86\_64  
 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: Version 05.00.00 released Apr-2023  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 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	550	2780	546	2800	<b>548</b>	<b>2790</b>	960	502	3050	499	3060	<b>501</b>	<b>3050</b>
502.gcc_r	960	510	2660	<b>509</b>	<b>2670</b>	508	2680	960	510	2660	<b>509</b>	<b>2670</b>	508	2680
505.mcf_r	960	288	5390	<b>288</b>	<b>5390</b>	288	5390	960	288	5390	<b>288</b>	<b>5390</b>	288	5390
520.omnetpp_r	960	577	2180	575	2190	<b>576</b>	<b>2190</b>	960	577	2180	575	2190	<b>576</b>	<b>2190</b>
523.xalancbmk_r	960	156	6490	<b>156</b>	<b>6480</b>	157	6440	960	156	6490	<b>156</b>	<b>6480</b>	157	6440
525.x264_r	960	<b>223</b>	<b>7530</b>	224	7490	222	7580	960	<b>211</b>	<b>7960</b>	213	7910	208	8090
531.deepsjeng_r	960	396	2780	398	2760	<b>398</b>	<b>2760</b>	960	396	2780	398	2760	<b>398</b>	<b>2760</b>
541.leela_r	960	590	2690	<b>592</b>	<b>2690</b>	596	2670	960	590	2690	<b>592</b>	<b>2690</b>	596	2670
548.exchange2_r	960	310	8100	<b>310</b>	<b>8100</b>	315	7980	960	310	8100	<b>310</b>	<b>8100</b>	315	7980
557.xz_r	960	<b>558</b>	<b>1860</b>	558	1860	559	1860	960	<b>558</b>	<b>1860</b>	558	1860	559	1860

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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](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/19cpu2017/lib/intel64:/home/19cpu2017/lib/ia32:/home/19cpu2017/je5.0.1-32"  
MALLOCONF = "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:  
 ENERGY\_PERF\_BIAS\_CFG mode set to Performance  
 Hardware Prefetch set to Disable  
 VT Support set to Disable  
 Sub NUMA Cluster (SNC) set to SNC4

Sysinfo program /home/l9cpu2017/bin/sysinfo  
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
 running on localhost.localdomain Fri May 5 04:05:10 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 250 (250-6.e19\_0)
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. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent\_hugepage
19. /sys/kernel/mm/transparent\_hugepage/khugepaged
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS

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## Platform Notes (Continued)

```
-----
1. uname -a
Linux localhost.localdomain 5.14.0-70.22.1.el9_0.x86_64 #1 SMP PREEMPT Tue Aug 2 10:02:12 EDT 2022 x86_64
x86_64 x86_64 GNU/Linux
-----
```

```
-----
2. w
 04:05:10 up 4 min,  1 user,  load average: 5.00, 10.27, 4.91
USER      TTY      LOGIN@  IDLE   JCPU   PCPU   WHAT
root      tty1     04:02   14.00s  1.58s  0.02s  -bash
-----
```

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

```
-----
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) 8254452
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) 8254452
virtual memory                (kbytes, -v) unlimited
file locks                    (-x) unlimited
-----
```

```
-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 27
login -- root
-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,peak -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,peak --output_format all --nopower
--runmode rate --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.005/tempslogs/preenv.intrate.005.0.log --lognum 005.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/19cpu2017
-----
```

```
-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) Platinum 8490H
vendor_id      : GenuineIntel
cpu family      : 6
model           : 143
stepping        : 6
-----
```

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## Platform Notes (Continued)

```

microcode      : 0x2b0001b0
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 2.37.4:

```

Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Address sizes:         52 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:              6
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 ds_cpl
                      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 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

```

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## Platform Notes (Continued)

wbnoinvd dtherm ida arat pln pts hwp hwp\_act\_window hwp\_epp hwp\_pkg\_req  
avx512vbmi umip pku ospke waitpkg avx512\_vbmi2 gfni vaes vpcplmulqdq  
avx512\_vnni avx512\_bitalg tme avx512\_vpoptndq 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

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  
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

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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: 64063 MB
node 0 free: 63667 MB
node 1 cpus: 15-29,495-509
node 1 size: 64505 MB
node 1 free: 64216 MB
node 2 cpus: 30-44,510-524
node 2 size: 64505 MB
node 2 free: 64222 MB
node 3 cpus: 45-59,525-539
node 3 size: 64505 MB
node 3 free: 64214 MB
node 4 cpus: 60-74,540-554
node 4 size: 64505 MB
node 4 free: 64250 MB
node 5 cpus: 75-89,555-569
node 5 size: 64505 MB
node 5 free: 64213 MB
node 6 cpus: 90-104,570-584
node 6 size: 64505 MB
node 6 free: 64249 MB
node 7 cpus: 105-119,585-599
node 7 size: 64505 MB
node 7 free: 64237 MB
node 8 cpus: 120-134,600-614
node 8 size: 64505 MB
node 8 free: 63417 MB
node 9 cpus: 135-149,615-629
node 9 size: 64505 MB
node 9 free: 63994 MB
node 10 cpus: 150-164,630-644
node 10 size: 64505 MB
node 10 free: 63462 MB
node 11 cpus: 165-179,645-659
node 11 size: 64505 MB
node 11 free: 63143 MB
node 12 cpus: 180-194,660-674
node 12 size: 64505 MB
node 12 free: 64227 MB
node 13 cpus: 195-209,675-689
node 13 size: 64505 MB
node 13 free: 64249 MB
node 14 cpus: 210-224,690-704
node 14 size: 64505 MB
node 14 free: 64267 MB
node 15 cpus: 225-239,705-719
node 15 size: 64505 MB
node 15 free: 64234 MB
node 16 cpus: 240-254,720-734
node 16 size: 64505 MB
node 16 free: 64196 MB
node 17 cpus: 255-269,735-749
node 17 size: 64505 MB
node 17 free: 64193 MB
node 18 cpus: 270-284,750-764
node 18 size: 64505 MB
node 18 free: 64002 MB

```

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## Platform Notes (Continued)

```

node 19 cpus: 285-299,765-779
node 19 size: 64505 MB
node 19 free: 63676 MB
node 20 cpus: 300-314,780-794
node 20 size: 64505 MB
node 20 free: 64196 MB
node 21 cpus: 315-329,795-809
node 21 size: 64505 MB
node 21 free: 64249 MB
node 22 cpus: 330-344,810-824
node 22 size: 64505 MB
node 22 free: 64229 MB
node 23 cpus: 345-359,825-839
node 23 size: 64505 MB
node 23 free: 64243 MB
node 24 cpus: 360-374,840-854
node 24 size: 64505 MB
node 24 free: 64170 MB
node 25 cpus: 375-389,855-869
node 25 size: 64469 MB
node 25 free: 64228 MB
node 26 cpus: 390-404,870-884
node 26 size: 64505 MB
node 26 free: 64242 MB
node 27 cpus: 405-419,885-899
node 27 size: 64505 MB
node 27 free: 64247 MB
node 28 cpus: 420-434,900-914
node 28 size: 64505 MB
node 28 free: 64222 MB
node 29 cpus: 435-449,915-929
node 29 size: 64505 MB
node 29 free: 64245 MB
node 30 cpus: 450-464,930-944
node 30 size: 64505 MB
node 30 free: 64242 MB
node 31 cpus: 465-479,945-959
node 31 size: 64458 MB
node 31 free: 64193 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
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 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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## Platform Notes (Continued)

```

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  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  21  21  21  21  21  21  21  21  21  10  12  12  12  31  31  31  31  21  21  21  21  21
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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
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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
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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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31  31  31  21  21  21  21
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31  31  31  21  21  21  21
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26: 21  21  21  21  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
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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  31  21  21  21  21  21
21  21  21  12  12  12  10

```

```

-----
9. /proc/meminfo
MemTotal:      2113180380 kB

```

```

-----
10. who -r
run-level 3 May 5 04:02

```

```

-----
11. Systemd service manager version: systemd 250 (250-6.el9_0)
Default Target    Status
multi-user        degraded

```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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Inspur Electronic Information Industry Co., Ltd.  
(IEI)

SPECrate®2017\_int\_base = 3700

TS860G7 (Intel Xeon Platinum 8490H)

SPECrate®2017\_int\_peak = 3750

CPU2017 License: 3358

Test Date: May-2023

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Hardware Availability: Jul-2023

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Software Availability: Dec-2022

## Platform Notes (Continued)

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

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
* NetworkManager-wait-online.service	loaded	failed	failed	Network Manager Wait Online

13. Services, from `systemctl list-unit-files`

STATE	UNIT	FILES
enabled	NetworkManager	NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond dbus-broker firewalld getty@ kdump lvm2-monitor mdmonitor microcode nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd systemd-network-generator tuned udisks2 upower
enabled-runtime	systemd-remount-fs	
disabled	blk-availability canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot chrony-wait console-getty cpupower debug-shell irqbalance kvm_stat man-db-restart-cache-update nftables powertop rdisc rhsm rhsm-facts rpmdb-rebuild serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo	
indirect		

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

```
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.22.1.el9_0.x86_64
root=/dev/mapper/rhel-root
ro
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root
rd.lvm.lv=rhel/swap
```

15. `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
```

16. `tuned-adm active`

```
Current active profile: throughput-performance
```

17. `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

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## Platform Notes (Continued)

```

vm.watermark_boost_factor      15000
vm.watermark_scale_factor      10
vm.zone_reclaim_mode           0

```

```

-----
18. /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

```

```

-----
19. /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

```

```

-----
20. OS release
From /etc/*-release /etc/*-version
os-release      Red Hat Enterprise Linux 9.0 (Plow)
redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
system-release Red Hat Enterprise Linux release 9.0 (Plow)

```

```

-----
21. Disk information
SPEC is set to: /home/19cpu2017
Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs      2.9T      523G  2.4T  18% /home

```

```

-----
22. /sys/devices/virtual/dmi/id
Vendor:          IEI
Product:         TS860G7
Product Family: Not specified
Serial:          000000000

```

```

-----
23. 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:
  64x Samsung M321R4GA3BB6-CQKEG 32 GB 2 rank 4800

```

```

-----
24. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:      American Megatrends International, LLC.
BIOS Version:     05.00.00
BIOS Date:        04/07/2023

```



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Software Availability: Dec-2022

## 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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
-----

```

```

-----
Fortran | 548.exchange2_r(base, peak)
-----

```

```

-----
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
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

```



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SPECrate®2017\_int\_peak = 3750

CPU2017 License: 3358

Test Date: May-2023

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Hardware Availability: Jul-2023

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Software Availability: Dec-2022

## 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
```

## 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)



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SPECrate®2017\_int\_peak = 3750

CPU2017 License: 3358

Test Date: May-2023

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Hardware Availability: Jul-2023

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Software Availability: Dec-2022

## Peak Optimization Flags (Continued)

500.perlbench\_r (continued):

```
-fprofile-use=default.profddata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/intel/compiler/2023.0.0/linux/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/usr/local/intel/compiler/2023.0.0/linux/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/Intel-ic2023-official-linux64.html>

<http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-intel-V3.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml>

<http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-intel-V3.xml>



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**Tested by:** Inspur Electronic Information Industry Co., Ltd. (IEI)

**Software Availability:** Dec-2022

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