



SPEC CPU®2017 Integer Rate Result

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Lenovo Global Technology

ThinkSystem SR950 V3

(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 2760
SPECrate®2017_int_energy_base = 971
SPECrate®2017_int_peak = Not Run
SPECrate®2017_int_energy_peak = Not Run

CPU2017 License: 9017

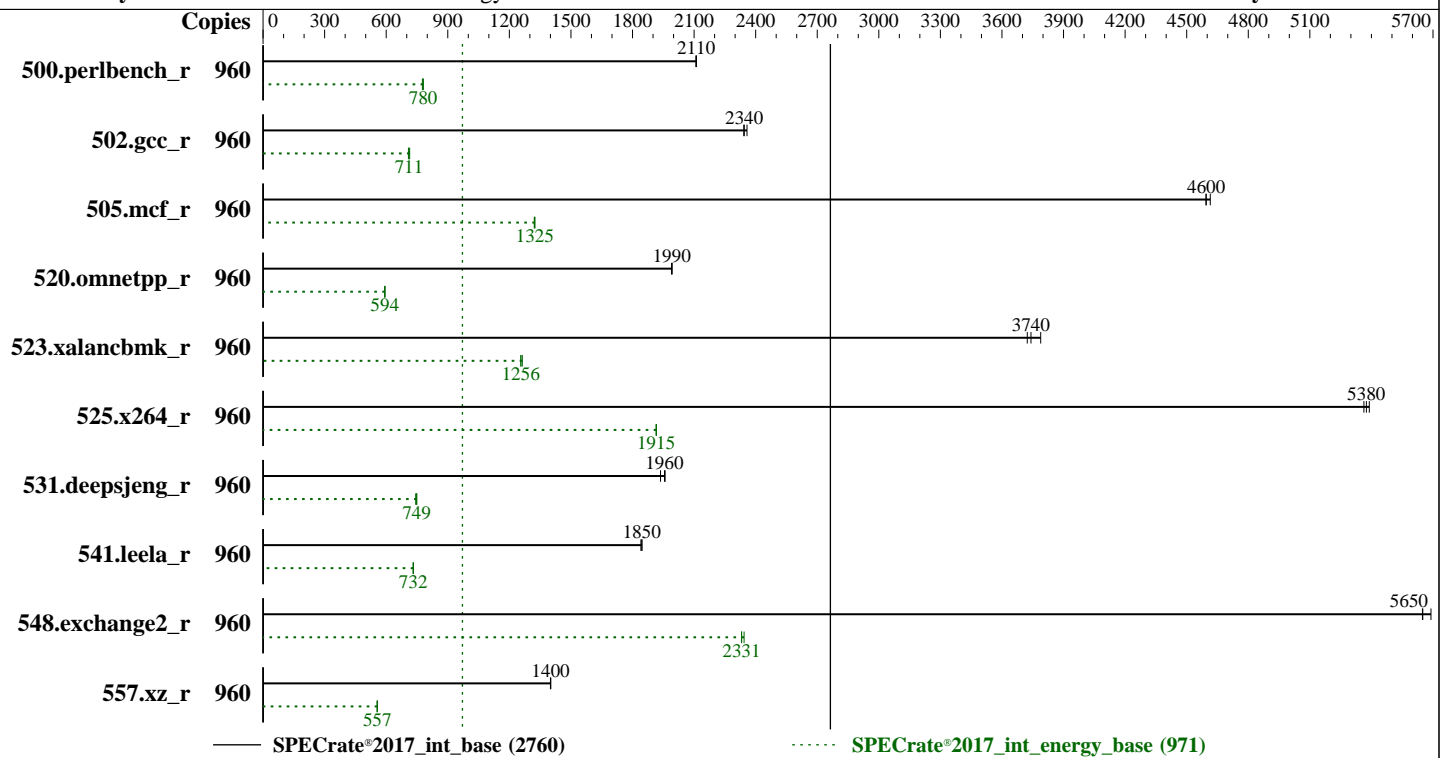
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2024

Hardware Availability: Oct-2023

Software Availability: Jun-2024



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 960GB M.2 NVMe SSD
 Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP5
 Kernel 5.14.21-150500.53-default
 Compiler: C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;
 Parallel: No
 Firmware: Lenovo BIOS Version EBE107H 2.20 released Jun-2024
 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 balance power and performance

Power

Max. Power (W): 4336.9
 Idle Power (W): 1474.21
 Min. Temperature (C): 21.44
 Elevation (m): 43
 Line Standard: 220 V / 50 Hz / 1 phase / 3 wires
 Provisioning: Line-powered



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Power Settings

Management FW: Version 3.10 of EBX307I
Memory Mode: Normal

Power-Relevant Hardware

Power Supply: 8 x 1800 W (redundant)
Details: ThinkSystem V3 1800W 230V Titanium Power Supply 4P57A78359
Backplane: Embedded M.2 drive
Other Storage: None
Storage Model #s: 4XB7A13999
NICs Installed: 1 x ThinkSystem Ethernet 4-port Adaptor @ 10 / 25 Gb
NICs Enabled (FW/OS): 4 / 1
NICs Connected/Speed: 1 @ 10 Gb
Other HW Model #s: 24 x simple-swap dual-rotor 60 mm fan

Power Analyzer #1

Power Analyzer: WIN1:9888
Hardware Vendor: YOKOGAWA, Inc.
Model: YokogawaWT310E
Serial Number: C3SH31009E
Input Connection: Default
Metrology Institute: CNAS
Calibration By: GRG METROLOGY & TEST (BEIJING) CO., LTD.
Calibration Label: J202308266858A-0007
Calibration Date: 16-Oct-2023
PTDaemon® Version: 1.10.0 (82175bac; 2022-08-17)
Setup Description: Connected to PSU1
Current Ranges Used: 20A
Voltage Range Used: 300V

Power Analyzer #2

Power Analyzer: WIN:9888
Hardware Vendor: YOKOGAWA, Inc.
Model: YokogawaWT310E
Serial Number: C3UG05013E
Input Connection: Default
Metrology Institute: CNAS
Calibration By: GRG METROLOGY & TEST (BEIJING) CO., LTD.
Calibration Label: J202308266858A-0004
Calibration Date: 16-Oct-2023
PTDaemon Version: 1.10.0 (82175bac; 2022-08-17)
Setup Description: Connected to PSU1
Current Ranges Used: 20A
Voltage Range Used: 300V

Temperature Meter #1

Temperature Meter: WIN1:9889
Hardware Vendor: Digi International, Inc.
Model: DigiWATCHPORT_H
Serial Number: W63074362
Input Connection: USB
PTDaemon Version: 1.10.0 (82175bac; 2022-08-17)
Setup Description: 50 mm in front of SUT main intake

Temperature Meter #2

Temperature Meter: WIN:9889
Hardware Vendor: Digi International, Inc.
Model: DigiWATCHPORT_H
Serial Number: W63181846
Input Connection: USB
PTDaemon Version: 1.10.0 (82175bac; 2022-08-17)
Setup Description: 50 mm in front of SUT main intake

Base Results Table

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
500.peribench_r	960	725	2110	2140	776	2950	3610	724	2110	2130	780	2940	3600	724	2110	2120	781	2940	3560
502.gcc_r	960	580	2340	2080	708	3590	3980	577	2360	2070	714	3580	3970	580	2340	2080	711	3580	3990
505.mcf_r	960	336	4610	1280	1320	3820	4110	338	4600	1280	1320	3800	4080	338	4590	1280	1320	3800	4100
520.omnetpp_r	960	632	1990	2300	593	3640	3730	632	1990	2300	594	3630	3730	633	1990	2300	593	3640	3720
523.xalancbmk_r	960	272	3720	874	1260	3210	4330	268	3790	869	1260	3250	4340	271	3740	874	1260	3230	4320
525.x264_r	960	313	5360	951	1920	3030	3720	312	5390	951	1920	3050	3720	313	5380	951	1920	3040	3710
531.deepsjeng_r	960	562	1960	1600	749	2840	3500	562	1960	1600	749	2840	3450	568	1940	1610	744	2830	3500
541.leela_r	960	864	1840	2350	731	2720	3120	861	1850	2350	732	2730	3110	861	1850	2350	732	2730	3110
548.exchange2_r	960	445	5650	1170	2330	2630	2680	442	5690	1160	2340	2630	2680	445	5650	1170	2330	2630	2680

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



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Base Results Table (Continued)

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
557.xz_r	960	740	1400	2030	556	2740	3400	740	1400	2030	556	2740	3410	740	1400	2020	557	2730	3410

SPECrate®2017_int_base = **2760**

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

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.9-ic2024.1/lib/intel64:/home/cpu2017-1.1.9-ic2024.1/lib/ia32:/home/cpu2017-1.1.9-ic
2024.1/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>
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:
Choose Operating Mode set to Efficiency - Favor Power and then set it to Custom Mode
Memory Speed set to Maximum Performance
Optimized Power Mode set to Enable
SNC set to SNC4

Sysinfo program /home/cpu2017-1.1.9-ic2024.1/bin/sysinfo

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Platform Notes (Continued)

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on SR950V3 Sun Aug 11 00:11:44 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 249 (249.16+suse.171.gdad0071f15)
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 SR950V3 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043)
x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
00:11:44 up 2 days, 7 min, 1 user, load average: 54.06, 531.52, 777.87
USER      TTY      FROM          LOGIN@      IDLE        JCPU   PCPU   WHAT
root      tty1    -              Fri00       5:05m     2.19s   0.07s  sh
Run502-compliant-ic2024.1-lin-sapphirerapids-rateint-base-smt-on-20240308.sh
```

```
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) 16511861
max locked memory       (kbytes, -l) unlimited
```

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Platform Notes (Continued)

```

max memory size      (kbytes, -m) unlimited
open files           (-n) 1024000
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) 16511861
virtual memory       (kbytes, -v) unlimited
file locks           (-x) unlimited

```

```

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
/bin/bash ./run_SR950V3.sh
sh Run502-compliant-ic2024.1-lin-sapphirerapids-rateint-base-smt-on-20240308.sh
runcpu --power --nobuild --action validate --define default-platform-flags --define numcopies=960 -c
ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=480 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base -o all intrate
runcpu --power --nobuild --action validate --define default-platform-flags --define numcopies=960
--configfile ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=480 --define
physicalfirst --define invoke_with_interleave --define drop_caches --tune base --output_format all
--runmode rate --tune base --size refrate intrate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.049/temlogs/preenv.intrate.049.0.log --lognum 049.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017-1.1.9-ic2024.1

```

```

-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) Platinum 8490H
vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping       : 8
microcode      : 0x2b0005d1
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
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

```

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Platform Notes (Continued)

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

```

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Platform Notes (Continued)

```

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 and seccomp
Vulnerability Spectre v1:   Mitigation; usercopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2:   Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSE-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: 128670 MB
node 0 free: 127145 MB
node 1 cpus: 15-29,495-509
node 1 size: 129016 MB
node 1 free: 127762 MB
node 2 cpus: 30-44,510-524
node 2 size: 129016 MB
node 2 free: 127766 MB
node 3 cpus: 45-59,525-539
node 3 size: 129016 MB
node 3 free: 127709 MB

```

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Platform Notes (Continued)

```
node 4 cpus: 60-74,540-554
node 4 size: 129016 MB
node 4 free: 127700 MB
node 5 cpus: 75-89,555-569
node 5 size: 129016 MB
node 5 free: 127672 MB
node 6 cpus: 90-104,570-584
node 6 size: 129016 MB
node 6 free: 127647 MB
node 7 cpus: 105-119,585-599
node 7 size: 129016 MB
node 7 free: 127706 MB
node 8 cpus: 120-134,600-614
node 8 size: 129016 MB
node 8 free: 127685 MB
node 9 cpus: 135-149,615-629
node 9 size: 129016 MB
node 9 free: 127711 MB
node 10 cpus: 150-164,630-644
node 10 size: 129016 MB
node 10 free: 127688 MB
node 11 cpus: 165-179,645-659
node 11 size: 129016 MB
node 11 free: 127679 MB
node 12 cpus: 180-194,660-674
node 12 size: 129016 MB
node 12 free: 127645 MB
node 13 cpus: 195-209,675-689
node 13 size: 129016 MB
node 13 free: 127721 MB
node 14 cpus: 210-224,690-704
node 14 size: 129016 MB
node 14 free: 127705 MB
node 15 cpus: 225-239,705-719
node 15 size: 129016 MB
node 15 free: 127746 MB
node 16 cpus: 240-254,720-734
node 16 size: 129016 MB
node 16 free: 127712 MB
node 17 cpus: 255-269,735-749
node 17 size: 129016 MB
node 17 free: 127757 MB
node 18 cpus: 270-284,750-764
node 18 size: 129016 MB
node 18 free: 127717 MB
node 19 cpus: 285-299,765-779
node 19 size: 129016 MB
node 19 free: 127611 MB
node 20 cpus: 300-314,780-794
node 20 size: 129016 MB
node 20 free: 127707 MB
node 21 cpus: 315-329,795-809
node 21 size: 129016 MB
node 21 free: 127702 MB
node 22 cpus: 330-344,810-824
node 22 size: 129016 MB
node 22 free: 127741 MB
```

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Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2024

Hardware Availability: Oct-2023

Software Availability: Jun-2024

Platform Notes (Continued)

```

node 23 cpus: 345-359,825-839
node 23 size: 129016 MB
node 23 free: 127748 MB
node 24 cpus: 360-374,840-854
node 24 size: 129016 MB
node 24 free: 127722 MB
node 25 cpus: 375-389,855-869
node 25 size: 128981 MB
node 25 free: 127662 MB
node 26 cpus: 390-404,870-884
node 26 size: 129016 MB
node 26 free: 127746 MB
node 27 cpus: 405-419,885-899
node 27 size: 129016 MB
node 27 free: 127688 MB
node 28 cpus: 420-434,900-914
node 28 size: 129016 MB
node 28 free: 127713 MB
node 29 cpus: 435-449,915-929
node 29 size: 129016 MB
node 29 free: 127660 MB
node 30 cpus: 450-464,930-944
node 30 size: 129016 MB
node 30 free: 127692 MB
node 31 cpus: 465-479,945-959
node 31 size: 128869 MB
node 31 free: 127579 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 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 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 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 21 21 21 21 21
21 21 21 31 31 31 31
4: 21 21 21 21 21 10 12 12 12 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 21 12 10 12 12 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 21 12 12 10 12 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 21 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

```

(Continued on next page)



SPEC CPU®2017 Integer Rate Result

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Lenovo Global Technology
ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 2760
SPECrate®2017_int_energy_base = 971
SPECrate®2017_int_peak = Not Run
SPECrate®2017_int_energy_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Aug-2024
Hardware Availability: Oct-2023
Software Availability: Jun-2024

Platform Notes (Continued)

```

21 21 21 31 31 31 31
14: 31 31 31 31 31 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 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 21 21 21 21 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 21 21 21 21 12 10 12 12 31
31 31 31 21 21 21
22: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 21 12 12 10 12 31
31 31 31 21 21 21
23: 21 21 21 21 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
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
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
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
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
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 31 21 21 21 21 21
21 21 21 12 12 12 10

```

```

-----
9. /proc/meminfo
MemTotal: 4227068576 kB

```

```

-----
10. who -r
run-level 3 Aug 9 00:06

```

```

-----
11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)
Default Target Status
multi-user running

```

```

-----
12. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ irqbalance issue-generator
kbdsettings klog lvm2-monitor nscd nvme-fc-boot-connections postfix purge-kernels rollback
rsyslog sapconf smartd sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4

```

(Continued on next page)



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Platform Notes (Continued)

```

enabled-runtime  wickedd-dhcp6 wickedd-nanny
disabled         systemd-remount-fs
                 autofsd autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                 chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info
                 firewallld gpm grub2-once haveged haveged-switch-root ipmi ipmievd issue-add-ssh-keys
                 kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nvmmf-autoconnect rpcbind
                 rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd sysstat
                 systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                 systemd-time-wait-sync systemd-timesyncd tuned
generated        jexec
indirect         uuid wickedd

```

```

-----
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
root=UUID=b8alc7fb-42d6-488a-810e-11797ff5b84f
splash=silent
mitigations=auto
quiet
security=apparmor

```

```

-----
14. cpupower frequency-info
analyzing CPU 0:
Unable to determine current policy
boost state support:
Supported: no
Active: no

```

```

-----
15. tuned-adm active
It seems that tuned daemon is not running, preset profile is not activated.
Preset profile: throughput-performance

```

```

-----
16. sysctl
kernel.numa_balancing          0
kernel.randomize_va_space     2
vm.compaction_proactiveness    20
vm.dirty_background_bytes     314572800
vm.dirty_background_ratio     0
vm.dirty_bytes                629145600
vm.dirty_expire_centiseecs    3000
vm.dirty_ratio                0
vm.dirty_writeback_centiseecs 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                  60
vm.watermark_boost_factor     15000
vm.watermark_scale_factor     10
vm.zone_reclaim_mode          0

```

(Continued on next page)



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Platform Notes (Continued)

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 SP5

20. Disk information
SPEC is set to: /home/cpu2017-1.1.9-ic2024.1
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p3 xfs 890G 36G 855G 4% /

21. /sys/devices/virtual/dmi/id
Vendor: Lenovo
Product: ThinkSystem SR950 V3
Product Family: ThinkSystem
Serial: BLRSDV044

22. dmidecode
Additional information from dmidecode 3.4 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:
41x SK Hynix HMCG94AEBRA102N 64 GB 2 rank 4800
14x SK Hynix HMCG94AEBRA109N 64 GB 2 rank 4800
9x SK Hynix HMCG94AEBRA123N 64 GB 2 rank 4800

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

BIOS Vendor: Lenovo
BIOS Version: EBE107H-2.20
BIOS Date: 06/18/2024
BIOS Revision: 2.20
Firmware Revision: 3.10



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CPU2017 License: 9017	Test Date: Aug-2024
Test Sponsor: Lenovo Global Technology	Hardware Availability: Oct-2023
Tested by: Lenovo Global Technology	Software Availability: Jun-2024

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 2024.1.0 Build 20240308
Copyright (C) 1985-2024 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 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
-----
```

```
=====
Fortran | 548.exchange2_r(base)
-----
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 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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CPU2017 License: 9017

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Test Date: Aug-2024

Hardware Availability: Oct-2023

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Base Optimization Flags

C benchmarks:

```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/opt/intel/oneapi/compiler/2024.1/lib -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/opt/intel/oneapi/compiler/2024.1/lib -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/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc
```

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

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Eaglestream-AB.html>
<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.html>

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

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Eaglestream-AB.xml>
<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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