



# SPEC CPU®2017 Integer Rate Result

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## Supermicro

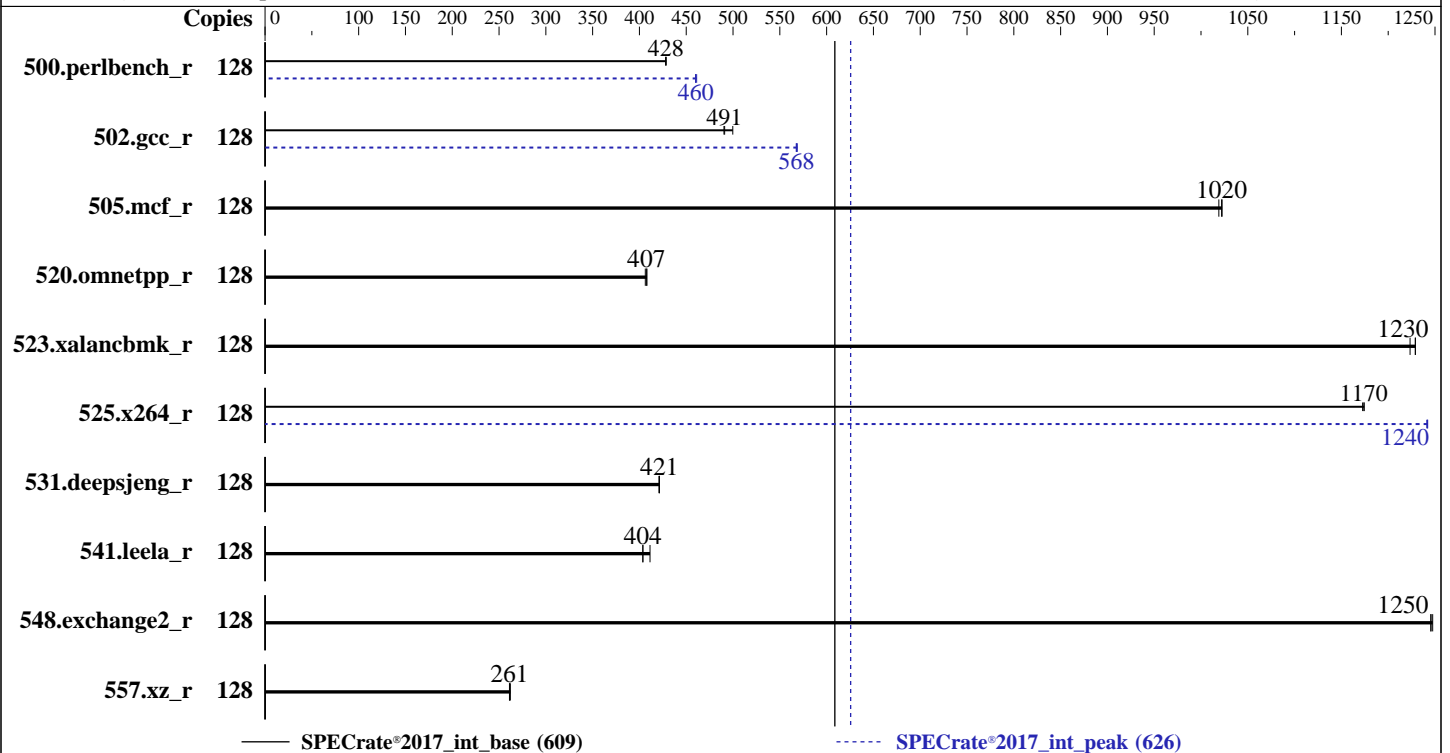
SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon 9462)

SPECrate®2017\_int\_base = 609

SPECrate®2017\_int\_peak = 626

CPU2017 License: 001176  
Test Sponsor: Supermicro  
Tested by: Supermicro

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



### Hardware

CPU Name: Intel Xeon Max 9462  
Max MHz: 3500  
Nominal: 2700  
Enabled: 64 cores, 2 chips, 2 threads/core  
Orderable: 1,2 chips  
Cache L1: 32 KB I + 48 KB D on chip per core  
L2: 2 MB I+D on chip per core  
L3: 75 MB I+D on chip per chip  
Other: None  
Memory: 1152 GB (16 x 64 GB 2Rx4 PC5-4800-R + 2 x 64 GB HBM)  
Storage: 1 x 960 GB NVMe SSD  
Other: None

### Software

OS: SUSE Linux Enterprise Server 15 SP5  
5.14.21-150500.53-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: Version 1.4 released Aug-2023  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other: jemalloc memory allocator V5.0.1  
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	128	476	428	475	429	<b>476</b>	<b>428</b>	128	442	461	443	460	<b>443</b>	<b>460</b>
502.gcc_r	128	370	490	<b>369</b>	<b>491</b>	363	500	128	<b>319</b>	<b>568</b>	319	568	319	569
505.mcf_r	128	<b>202</b>	<b>1020</b>	203	1020	202	1020	128	<b>202</b>	<b>1020</b>	203	1020	202	1020
520.omnetpp_r	128	<b>412</b>	<b>407</b>	412	408	413	406	128	<b>412</b>	<b>407</b>	412	408	413	406
523.xalancbmk_r	128	<b>110</b>	<b>1230</b>	110	1230	110	1220	128	<b>110</b>	<b>1230</b>	110	1230	110	1220
525.x264_r	128	191	1170	191	1170	<b>191</b>	<b>1170</b>	128	<b>180</b>	<b>1240</b>	181	1240	180	1240
531.deepsjeng_r	128	<b>348</b>	<b>421</b>	349	421	348	421	128	<b>348</b>	<b>421</b>	349	421	348	421
541.leela_r	128	525	404	<b>525</b>	<b>404</b>	515	411	128	525	404	<b>525</b>	<b>404</b>	515	411
548.exchange2_r	128	269	1250	<b>269</b>	<b>1250</b>	269	1250	128	269	1250	<b>269</b>	<b>1250</b>	269	1250
557.xz_r	128	527	262	529	261	<b>529</b>	<b>261</b>	128	527	262	529	261	<b>529</b>	<b>261</b>

SPECrate®2017\_int\_base = **609**

SPECrate®2017\_int\_peak = **626**

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 config file option 'submit' was used.

## 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/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/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.  
jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  
sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

## Platform Notes

### BIOS Settings:

Power Performance Tuning = BIOS Controls EPB  
ENERGY\_PERF\_BIAS\_CFG mode = Performance  
DCU Streamer Prefetcher = Disable  
SNC = Enable SNC4 (4-clusters)  
LLC Dead Line Alloc = Disable

### IPMI Settings:

Fan Mode: Full Speed  
Enable Smart Power: OFF  
Using upgraded fans at 16.8K RPM

Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
running on localhost Mon Oct 23 17:31:36 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 (249.16+suse.171.gdad0071f15)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. sysctl
16. /sys/kernel/mm/transparent\_hugepage
17. /sys/kernel/mm/transparent\_hugepage/khugepaged
18. OS release

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### Platform Notes (Continued)

- 19. Disk information
- 20. /sys/devices/virtual/dmi/id
- 21. dmidecode
- 22. BIOS

```
-----
1. uname -a
Linux localhost 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
17:31:36 up 5 min, 3 users, load average: 0.04, 0.03, 0.00
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
root      tty1     -               17:31    8.00s  1.30s  0.02s -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) 4124881
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) 4124881
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
-bash
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=64 --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=128 --configfile
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=64 --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/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
-----
```

```
-----
6. /proc/cpuinfo
model name      : Intel (R) Xeon (R) CPU Max 9462
-----
```

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### Platform Notes (Continued)

```
vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping       : 8
microcode      : 0x2c000271
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
cpu cores      : 32
siblings       : 64
2 physical ids (chips)
128 processors (hardware threads)
physical id 0: core ids 0-31
physical id 1: core ids 0-31
physical id 0: apicids 0-63
physical id 1: apicids 128-191
```

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):                 128
On-line CPU(s) list:   0-127
Vendor ID:              GenuineIntel
Model name:             Intel (R) Xeon (R) CPU Max 9462
CPU family:             6
Model:                  143
Thread(s) per core:    2
Core(s) per socket:    32
Socket(s):              2
Stepping:               8
CPU max MHz:            3500.0000
CPU min MHz:            800.0000
BogoMIPS:               5400.00
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 avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes
                        vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpoperntdq 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:              3 MiB (64 instances)
L1i cache:              2 MiB (64 instances)
L2 cache:               128 MiB (64 instances)
L3 cache:               150 MiB (2 instances)
```

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### Platform Notes (Continued)

```

NUMA node(s):                8
NUMA node0 CPU(s):          0-7,64-71
NUMA node1 CPU(s):          8-15,72-79
NUMA node2 CPU(s):          16-23,80-87
NUMA node3 CPU(s):          24-31,88-95
NUMA node4 CPU(s):          32-39,96-103
NUMA node5 CPU(s):          40-47,104-111
NUMA node6 CPU(s):          48-55,112-119
NUMA node7 CPU(s):          56-63,120-127
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/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:   Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBR SB-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	3M	12	Data	1	64	1	64
L1i	32K	2M	8	Instruction	1	64	1	64
L2	2M	128M	16	Unified	2	2048	1	64
L3	75M	150M	15	Unified	3	81920	1	64

8. numactl --hardware

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

```

available: 8 nodes (0-7)
node 0 cpus: 0-7,64-71
node 0 size: 128587 MB
node 0 free: 128103 MB
node 1 cpus: 8-15,72-79
node 1 size: 129019 MB
node 1 free: 128608 MB
node 2 cpus: 16-23,80-87
node 2 size: 129019 MB
node 2 free: 128602 MB
node 3 cpus: 24-31,88-95
node 3 size: 129019 MB
node 3 free: 128668 MB
node 4 cpus: 32-39,96-103
node 4 size: 129019 MB
node 4 free: 128528 MB
node 5 cpus: 40-47,104-111
node 5 size: 128985 MB
node 5 free: 128211 MB
node 6 cpus: 48-55,112-119
node 6 size: 129019 MB
node 6 free: 128648 MB
node 7 cpus: 56-63,120-127
node 7 size: 128578 MB
node 7 free: 128068 MB
node distances:
node  0  1  2  3  4  5  6  7
0:  10 17 17 17 26 26 26 26

```

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### Platform Notes (Continued)

1:	17	10	17	17	26	26	26	26
2:	17	17	10	17	26	26	26	26
3:	17	17	17	10	26	26	26	26
4:	26	26	26	26	10	17	17	17
5:	26	26	26	26	17	10	17	17
6:	26	26	26	26	17	17	10	17
7:	26	26	26	26	17	17	17	10

```
-----
9. /proc/meminfo
   MemTotal:      1056000572 kB
-----
```

```
-----
10. who -r
    run-level 3 Oct 23 17:31 last=5
-----
```

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

```
-----
12. Services, from systemctl list-unit-files
    STATE          UNIT FILES
    enabled         YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd bluetooth cron
                    display-manager firewalld getty@ irqbalance issue-generator kbdsettings kdump kdump-early
                    klog lvm2-monitor nscd nvme-fc-boot-connections postfix purge-kernels rollback rsyslog
                    smartd sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
    enabled-runtime systemd-remount-fs
    disabled        accounts-daemon 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 gpm grub2-once haveged haveged-switch-root ipmi ipmievd
                    issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb
                    nvme-autoconnect ostree-remount 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
                    update-system-flatpaks upower vncserver@
    indirect        wickedd
-----
```

```
-----
13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
    root=UUID=475d08b3-7eb6-429c-bff6-902e151200b2
    splash=silent
    resume=/dev/disk/by-uuid/fd0c744c-3382-422c-a977-6b10483703f7
    mitigations=auto
    quiet
    security=apparmor
    crashkernel=402M,high
    crashkernel=72M,low
-----
```

```
-----
14. 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
-----
```

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### Platform Notes (Continued)

```

-----
15. 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
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

-----
16. /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

-----
17. /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

-----
18. OS release
From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP5

-----
19. Disk information
SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p4 xfs 350G 5.3G 344G 2% /home

-----
20. /sys/devices/virtual/dmi/id
Vendor: Supermicro
Product: Super Server
Product Family: Family
Serial: 0123456789

-----
21. dmidecode

```

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### Platform Notes (Continued)

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:

8x Intel 16 GB 1 rank 3200  
16x Micron Technology MTC36F2046S1PC48BA1 64 GB 2 rank 4800

#### 22. BIOS

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

BIOS Vendor: American Megatrends International, LLC.  
BIOS Version: 1.4  
BIOS Date: 08/25/2023  
BIOS Revision: 5.31

Each Intel Xeon CPU Max 9462 is configured with 64 GB of High Bandwidth Memory (HBM) in-package. dmidecode is additionally reporting the capacity of the CPU in-package HBM stack as: '8x Intel 16 GB 1 rank 3200'

### Compiler Version Notes

C | 502.gcc\_r(peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.0.0 Build 20221201  
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C | 500.perlbench\_r(base, peak) 502.gcc\_r(base) 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  
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C | 502.gcc\_r(peak)

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C | 500.perlbench\_r(base, peak) 502.gcc\_r(base) 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  
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C++ | 520.omnetpp\_r(base, peak) 523.xalanbmk\_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  
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# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon 9462)

SPECrate®2017\_int\_base = 609

SPECrate®2017\_int\_peak = 626

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

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

## Compiler Version Notes (Continued)

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

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201  
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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  
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

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## Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin  
-lqkmalloc
```

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto  
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-nostandard-realloc-lhs -align array32byte -auto  
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin  
-lqkmalloc
```

## Peak Compiler Invocation

C benchmarks:

```
icx
```

C++ benchmarks:

```
icpx
```

Fortran benchmarks:

```
ifx
```

## Peak Portability Flags

```
500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64  
502.gcc_r: -D_FILE_OFFSET_BITS=64  
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
```

## Peak Optimization Flags

C benchmarks:

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## Peak Optimization Flags (Continued)

```
500.perlbench_r: -w -std=c11 -m64 -Wl,-z,muldefs  
-fprofile-generate(pass 1)  
-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  
-lqkmallocc
```

```
502.gcc_r: -m32  
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/ia32_lin  
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)  
-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  
-L/usr/local/jemalloc32-5.0.1/lib -ljemallocc
```

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  
-lqkmallocc
```

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/Supermicro-Platform-Settings-V1.2-SPR-revF.html>



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**CPU2017 License:** 001176

**Test Sponsor:** Supermicro

**Tested by:** Supermicro

**Test Date:** Oct-2023

**Hardware Availability:** Aug-2023

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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/Supermicro-Platform-Settings-V1.2-SPR-revF.xml>

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