



SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMEQUEST 4400E, Intel Xeon Platinum 8460H, 2.20GHz

SPECrate®2017_int_base = 1480

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

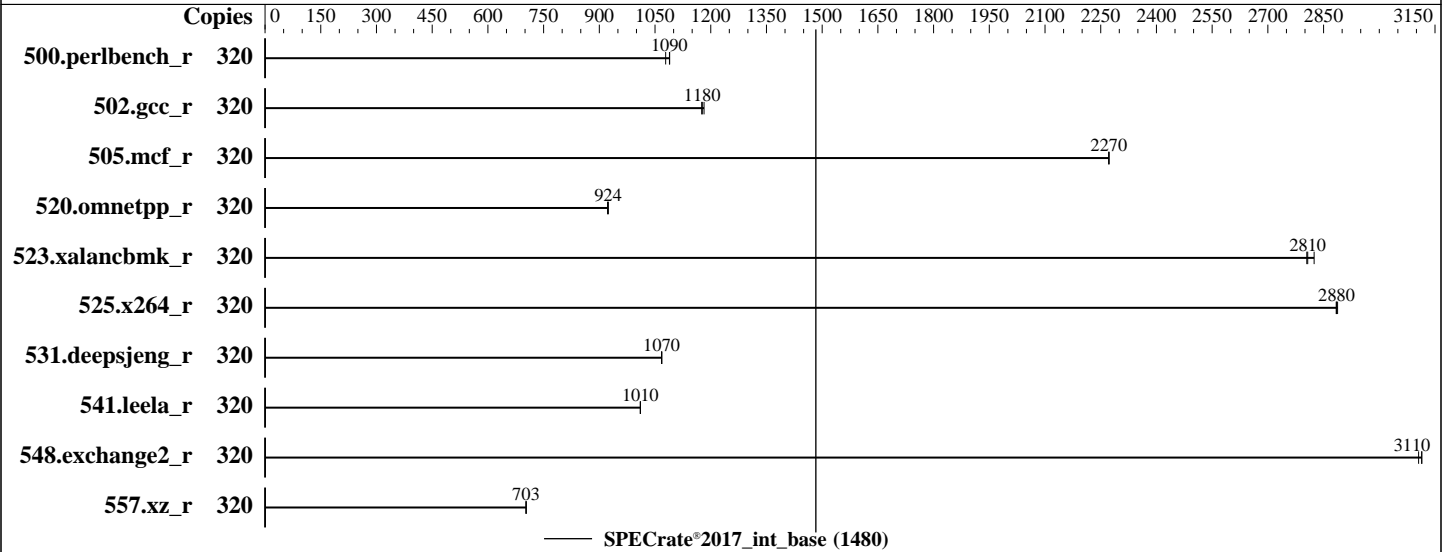
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Apr-2023

Hardware Availability: Jun-2023

Software Availability: Dec-2022



Hardware

CPU Name: Intel Xeon Platinum 8460H
 Max MHz: 3800
 Nominal: 2200
 Enabled: 160 cores, 4 chips, 2 threads/core
 Orderable: 2,4 chips
 Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 105 MB I+D on chip per chip
 Other: None
 Memory: 2 TB (32 x 64 GB 2Rx4 PC5-4800B-R)
 Storage: 1 x 1.92 TB SATA SSD
 Other: None

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 R1.10.0 for D3984-A1x. Released Jun-2023
 tested as V1.0.0.0 R0.20.0 for D3984-A1x Apr-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	320	472	1080	468	1090	468	1090							
502.gcc_r	320	383	1180	385	1180	385	1180							
505.mcf_r	320	228	2270	228	2270	228	2270							
520.omnetpp_r	320	455	924	454	924	455	922							
523.xalancbmk_r	320	120	2820	120	2800	120	2810							
525.x264_r	320	194	2880	194	2880	194	2890							
531.deepsjeng_r	320	343	1070	343	1070	343	1070							
541.leela_r	320	524	1010	524	1010	524	1010							
548.exchange2_r	320	270	3110	269	3110	269	3110							
557.xz_r	320	492	703	492	703	492	703							

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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
 Package C State limit = C0
 LLC Dead Line Alloc = Disabled
 CPU Performance Boost = Aggressive
 SNC (Sub NUMA) = Enable SNC4
 FAN Control = Full
 System date was wrongly set. The actual date is Apr-2023

Sysinfo program /home/Benchmark/speccpu/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Fri Apr 29 21:04:57 2022

SUT (System Under Test) info as seen by some common utilities.

Table of contents

1. `uname -a`
2. `w`
3. Username
4. `ulimit -a`
5. `sysinfo process ancestry`
6. `/proc/cpuinfo`
7. `lscpu`
8. `numactl --hardware`
9. `/proc/meminfo`
10. `who -r`
11. Systemd service manager version: `systemd 249 (249.11+suse.124.g2bc0b2c447)`
12. Failed units, from `systemctl list-units --state=failed`
13. Services, from `systemctl list-unit-files`
14. Linux kernel boot-time arguments, from `/proc/cmdline`
15. `cpupower frequency-info`
16. `sysctl`
17. `/sys/kernel/mm/transparent_hugepage`
18. `/sys/kernel/mm/transparent_hugepage/khugepaged`
19. OS release
20. Disk information
21. `/sys/devices/virtual/dmi/id`
22. `dmidecode`
23. BIOS

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Platform Notes (Continued)

```

-----
1. uname -a
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux

-----
2. w
 21:04:57 up 5 min,  1 user,  load average: 1.06, 7.39, 4.40
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU   WHAT
root      tty1    -             21:04   17.00s 3.05s  0.26s /home/Benchmark/PTU/ptat -mon -i 5000000
-filter 0x3f -ts -y

-----
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) 8253663
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) 8253663
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=320 -c
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=160 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base -o all intrate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=320 --configfile
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=160 --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/templots/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 8460H
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      : 40
siblings       : 80
4 physical ids (chips)
320 processors (hardware threads)
physical id 0: core ids 0-39
physical id 1: core ids 0-39
physical id 2: core ids 0-39
physical id 3: core ids 0-39
physical id 0: apicids 0-79
physical id 1: apicids 128-207
physical id 2: apicids 256-335
physical id 3: apicids 384-463
```

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):                320
On-line CPU(s) list:  0-319
Vendor ID:             GenuineIntel
Model name:            Intel(R) Xeon(R) Platinum 8460H
CPU family:            6
Model:                 143
Thread(s) per core:   2
Core(s) per socket:   40
Socket(s):             4
Stepping:              6
CPU max MHz:           3800.0000
CPU min MHz:           800.0000
BogoMIPS:              4400.00
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 sse3 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
                      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:             7.5 MiB (160 instances)
L1i cache:             5 MiB (160 instances)
L2 cache:              320 MiB (160 instances)
```

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Platform Notes (Continued)

```

L3 cache:                420 MiB (4 instances)
NUMA node(s):            16
NUMA node0 CPU(s):      0-9,160-169
NUMA node1 CPU(s):      10-19,170-179
NUMA node2 CPU(s):      20-29,180-189
NUMA node3 CPU(s):      30-39,190-199
NUMA node4 CPU(s):      40-49,200-209
NUMA node5 CPU(s):      50-59,210-219
NUMA node6 CPU(s):      60-69,220-229
NUMA node7 CPU(s):      70-79,230-239
NUMA node8 CPU(s):      80-89,240-249
NUMA node9 CPU(s):      90-99,250-259
NUMA node10 CPU(s):     100-109,260-269
NUMA node11 CPU(s):     110-119,270-279
NUMA node12 CPU(s):     120-129,280-289
NUMA node13 CPU(s):     130-139,290-299
NUMA node14 CPU(s):     140-149,300-309
NUMA node15 CPU(s):     150-159,310-319
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	7.5M	12	Data	1	64	1	64
L1i	32K	5M	8	Instruction	1	64	1	64
L2	2M	320M	16	Unified	2	2048	1	64
L3	105M	420M	15	Unified	3	114688	1	64

8. numactl --hardware

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

```

available: 16 nodes (0-15)
node 0 cpus: 0-9,160-169
node 0 size: 128598 MB
node 0 free: 127616 MB
node 1 cpus: 10-19,170-179
node 1 size: 128984 MB
node 1 free: 128604 MB
node 2 cpus: 20-29,180-189
node 2 size: 129018 MB
node 2 free: 128596 MB
node 3 cpus: 30-39,190-199
node 3 size: 129018 MB
node 3 free: 128726 MB
node 4 cpus: 40-49,200-209
node 4 size: 129018 MB
node 4 free: 128411 MB
node 5 cpus: 50-59,210-219
node 5 size: 129018 MB
node 5 free: 128415 MB
node 6 cpus: 60-69,220-229
node 6 size: 129018 MB
node 6 free: 128170 MB

```

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Platform Notes (Continued)

```

node 7 cpus: 70-79,230-239
node 7 size: 129018 MB
node 7 free: 128385 MB
node 8 cpus: 80-89,240-249
node 8 size: 129018 MB
node 8 free: 128481 MB
node 9 cpus: 90-99,250-259
node 9 size: 129018 MB
node 9 free: 128645 MB
node 10 cpus: 100-109,260-269
node 10 size: 129018 MB
node 10 free: 128626 MB
node 11 cpus: 110-119,270-279
node 11 size: 129018 MB
node 11 free: 128594 MB
node 12 cpus: 120-129,280-289
node 12 size: 129018 MB
node 12 free: 128422 MB
node 13 cpus: 130-139,290-299
node 13 size: 129018 MB
node 13 free: 128511 MB
node 14 cpus: 140-149,300-309
node 14 size: 129018 MB
node 14 free: 128484 MB
node 15 cpus: 150-159,310-319
node 15 size: 128611 MB
node 15 free: 128130 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
0:  10 12 12 12 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
2:  12 12 10 12 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
4:  21 21 21 21 10 12 12 12 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
6:  21 21 21 21 12 12 10 12 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
8:  21 21 21 21 31 31 31 31 10 12 12 12 21 21 21 21
9:  21 21 21 21 31 31 31 31 12 10 12 12 21 21 21 21
10: 21 21 21 21 31 31 31 31 12 12 10 12 21 21 21 21
11: 21 21 21 21 31 31 31 31 12 12 12 10 21 21 21 21
12: 31 31 31 31 21 21 21 21 21 21 21 21 10 12 12 12
13: 31 31 31 31 21 21 21 21 21 21 21 21 12 10 12 12
14: 31 31 31 31 21 21 21 21 21 21 21 21 12 12 10 12
15: 31 31 31 31 21 21 21 21 21 21 21 21 12 12 12 10

```

```

-----
9. /proc/meminfo
   MemTotal:      2112962640 kB

```

```

-----
10. who -r
    run-level 3 Apr 29 21:01

```

```

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

```

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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

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 firewallld gpm grub2-once
	haveged-switch-root	ipmi ipmievd iscsi-init iscsid iscsiui issue-add-ssh-keys kexec-load
	lunmask	man-db-create multipathd nfs nfs-blkmap nmb numad 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=8b4cfla0-f943-46c1-a409-c2bca0c1173e
splash=silent
mitigations=auto
quiet
security=apparmor
crashkernel=324M,high
crashkernel=72M,low

15. cpupower frequency-info

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

16. sysctl

kernel.numa_balancing	1
kernel.randomize_va_space	2
vm.compaction_proactiveness	20
vm.dirty_background_bytes	0
vm.dirty_background_ratio	10
vm.dirty_bytes	0
vm.dirty_expire_centisecs	3000
vm.dirty_ratio	20
vm.dirty_writeback_centisecs	500
vm.dirtytime_expire_seconds	43200
vm.extfrag_threshold	500
vm.min_unmapped_ratio	1
vm.nr_hugepages	0
vm.nr_hugepages_mempolicy	0
vm.nr_overcommit_hugepages	0

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Platform Notes (Continued)

```

vm.swappiness          60
vm.watermark_boost_factor 15000
vm.watermark_scale_factor 10
vm.zone_reclaim_mode  0

```

```

-----
17. /sys/kernel/mm/transparent_hugepage
defrag          always defer defer+madvice [madvice] never
enabled         [always] madvice never
hpage_pmd_size 2097152
shmem_enabled  always within_size advise [never] deny force

```

```

-----
18. /sys/kernel/mm/transparent_hugepage/khugepaged
alloc_sleep_millisecs 60000
defrag                 1
max_ptes_none         511
max_ptes_shared       256
max_ptes_swap         64
pages_to_scan         4096
scan_sleep_millisecs 10000

```

```

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

```

```

-----
20. Disk information
SPEC is set to: /home/Benchmark/speccpu
Filesystem  Type  Size  Used Avail Use% Mounted on
/dev/sda2   xfs   1.8T  55G  1.7T   4% /

```

```

-----
21. /sys/devices/virtual/dmi/id
Vendor:      FUJITSU LIMITED

```

```

-----
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:
  9x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800
  4x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800
  1x Samsung M321R8GA0BB0-CQKMG 64 GB 2 rank 4800
 18x 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 R0.20.0 for D3986-A1
BIOS Date:        04/28/2023
BIOS Revision:    0.20
Firmware Revision: 1.0

```



SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMEQUEST 4400E, Intel Xeon Platinum 8460H, 2.20GHz

SPECrate®2017_int_base = 1480

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

Compiler Version Notes

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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C++ | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)

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



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

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/Fujitsu-Platform-Settings-V1.0-SPR-RevB.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/Fujitsu-Platform-Settings-V1.0-SPR-RevB.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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