SPEC CPU®2017 Integer Rate Result

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IEIT Systems Co., Ltd.

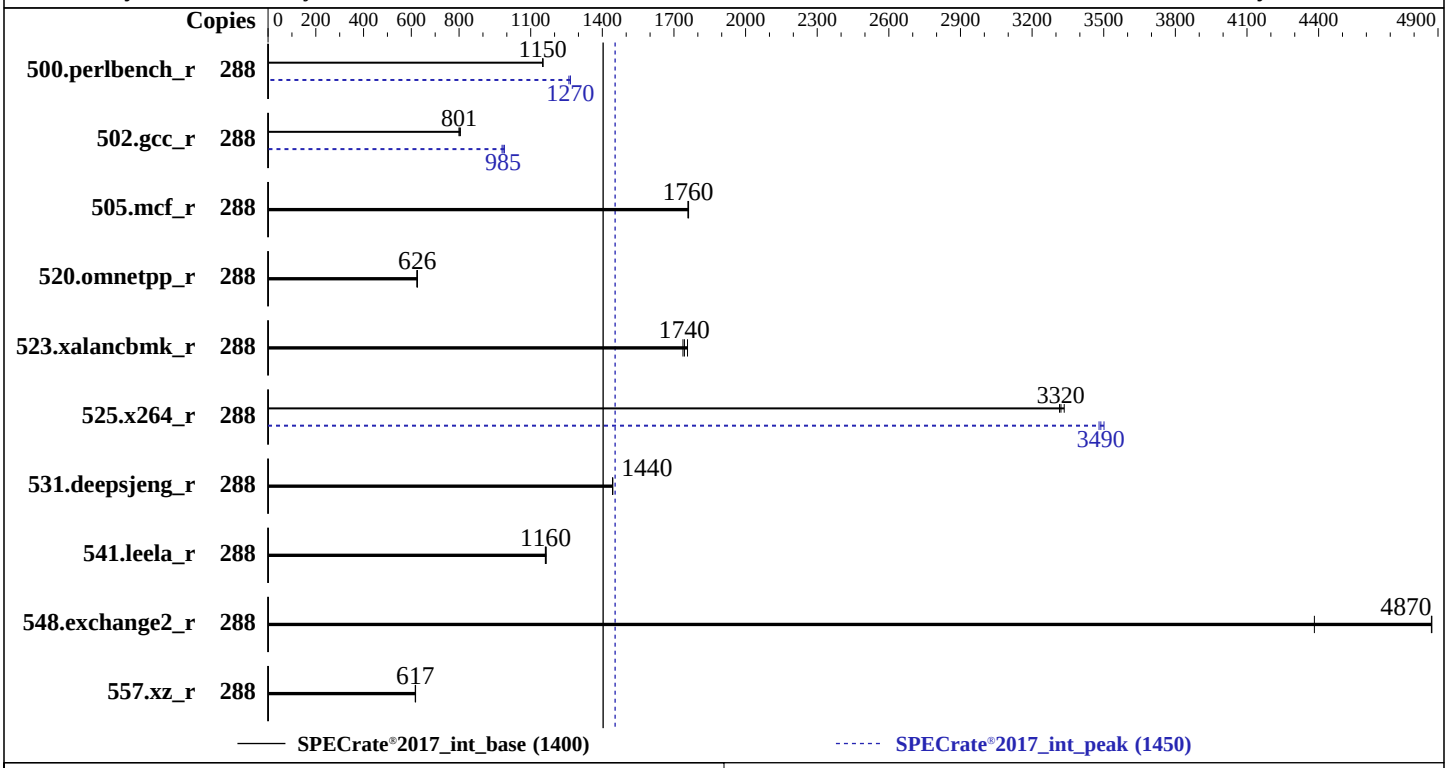
meta brain NF5280G8 (Intel Xeon 6780E)

SPECrate®2017_int_base = 1400

SPECrate®2017_int_peak = 1450

CPU2017 License: 3358
Test Sponsor: IEIT Systems Co., Ltd.
Tested by: IEIT Systems Co., Ltd.

Test Date: Jul-2024
Hardware Availability: Oct-2024
Software Availability: Mar-2024



Hardware

CPU Name:	Intel Xeon 6780E
Max MHz:	3000
Nominal:	2200
Enabled:	288 cores, 2 chips
Orderable:	1,2 chips
Cache L1:	64 KB I + 32 KB D on chip per core
L2:	4 MB I+D on chip per core
L3:	108 MB I+D on chip per chip
Other:	None
Memory:	1 TB (16 x 64 GB 2Rx4 PC5-6400B-R)
Storage:	1 x 1.92 TB NVME SSD
Other:	CPU Cooling: Air

Software

OS:	SUSE Linux Enterprise Server 15 SP5 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:	Version 00.14.00 released Jun-2024
File System:	btrfs
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	288	**398**	**1150**	398	1150	399	1150	288	362	1270	364	1260	**362**	**1270**
502.gcc_r	288	506	806	**509**	**801**	510	800	288	**414**	**985**	416	980	412	990
505.mcf_r	288	264	1760	265	1760	**264**	**1760**	288	264	1760	265	1760	**264**	**1760**
520.omnetpp_r	288	**604**	**626**	604	626	607	623	288	**604**	**626**	604	626	607	623
523.xalancbmk_r	288	173	1760	**174**	**1740**	175	1740	288	173	1760	**174**	**1740**	175	1740
525.x264_r	288	151	3330	**152**	**3320**	152	3310	288	144	3500	**145**	**3490**	145	3480
531.deepsjeng_r	288	229	1440	229	1440	**229**	**1440**	288	229	1440	229	1440	**229**	**1440**
541.leela_r	288	411	1160	**410**	**1160**	409	1170	288	411	1160	**410**	**1160**	409	1170
548.exchange2_r	288	155	4870	**155**	**4870**	172	4380	288	155	4870	**155**	**4870**	172	4380
557.xz_r	288	**504**	**617**	503	618	504	617	288	**504**	**617**	503	618	504	617

SPECrate®2017_int_base = 1400

SPECrate®2017_int_peak = 1450

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/lib/intel64:/home/CPU2017/lib/ia32:/home/CPU2017/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)
```

(Continued on next page)

General Notes (Continued)

```
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 configuration:
ENERGY_PERF_BIAS_CFG mode set to Performance
Hardware Prefetch set to Disable
VT Support set to Disable

Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Jul  9 04:35:45 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. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
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
   04:35:45 up 1 min,  1 user,  load average: 0.31, 0.13, 0.05
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                04:34    9.00s  1.73s  0.16s sh
  reportable-ic2024.1-lin-sierraforest-rate-20240308.sh

------------------------------------------------------------
```

(Continued on next page)

Platform Notes (Continued)

```
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) 4124105
  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) 4124105
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 29
 login -- root
 -bash
 sh reportable-ic2024.1-lin-sierraforest-rate-20240308.sh
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=288 -c
   ic2024.1-lin-sierraforest-rate-20240308.cfg --define smt-on --define cores=288 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --reportable --tune base,peak -o all intrate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=288 --configfile
   ic2024.1-lin-sierraforest-rate-20240308.cfg --define smt-on --define cores=288 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --reportable --tune base,peak --output_format all
   --nopower --runmode rate --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.034/templogs/preenv.intrate.034.0.log --lognum 034.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/CPU2017

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) 6780E
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 175
    stepping        : 3
    microcode       : 0x130001a0
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores       : 4
    siblings        : 4
    72 physical ids (chips)
    288 processors (hardware threads)
    physical id 0: core ids 0-3
    physical id 1: core ids 0-3
    physical id 2: core ids 0-3
    physical id 3: core ids 0-3
    physical id 4: core ids 0-3
    physical id 5: core ids 0-3
    physical id 6: core ids 0-3
    physical id 7: core ids 0-3
```

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Platform Notes (Continued)

```
physical id 8: core ids 0-3
physical id 9: core ids 0-3
physical id 10: core ids 0-3
physical id 11: core ids 0-3
physical id 12: core ids 0-3
physical id 13: core ids 0-3
physical id 14: core ids 0-3
physical id 15: core ids 0-3
physical id 16: core ids 0-3
physical id 17: core ids 0-3
physical id 18: core ids 0-3
physical id 19: core ids 0-3
physical id 20: core ids 0-3
physical id 21: core ids 0-3
physical id 22: core ids 0-3
physical id 23: core ids 0-3
physical id 24: core ids 0-3
physical id 25: core ids 0-3
physical id 26: core ids 0-3
physical id 27: core ids 0-3
physical id 28: core ids 0-3
physical id 29: core ids 0-3
physical id 30: core ids 0-3
physical id 31: core ids 0-3
physical id 32: core ids 0-3
physical id 33: core ids 0-3
physical id 34: core ids 0-3
physical id 35: core ids 0-3
physical id 64: core ids 0-3
physical id 65: core ids 0-3
physical id 66: core ids 0-3
physical id 67: core ids 0-3
physical id 68: core ids 0-3
physical id 69: core ids 0-3
physical id 70: core ids 0-3
physical id 71: core ids 0-3
physical id 72: core ids 0-3
physical id 73: core ids 0-3
physical id 74: core ids 0-3
physical id 75: core ids 0-3
physical id 76: core ids 0-3
physical id 77: core ids 0-3
physical id 78: core ids 0-3
physical id 79: core ids 0-3
physical id 80: core ids 0-3
physical id 81: core ids 0-3
physical id 82: core ids 0-3
physical id 83: core ids 0-3
physical id 84: core ids 0-3
physical id 85: core ids 0-3
physical id 86: core ids 0-3
physical id 87: core ids 0-3
physical id 88: core ids 0-3
physical id 89: core ids 0-3
physical id 90: core ids 0-3
physical id 91: core ids 0-3
physical id 92: core ids 0-3
physical id 93: core ids 0-3
physical id 94: core ids 0-3
physical id 95: core ids 0-3
```

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Platform Notes (Continued)

```
physical id 96: core ids 0-3
physical id 97: core ids 0-3
physical id 98: core ids 0-3
physical id 99: core ids 0-3
physical id 0: apicids 0,2,4,6
physical id 1: apicids 8,10,12,14
physical id 2: apicids 16,18,20,22
physical id 3: apicids 24,26,28,30
physical id 4: apicids 32,34,36,38
physical id 5: apicids 40,42,44,46
physical id 6: apicids 48,50,52,54
physical id 7: apicids 56,58,60,62
physical id 8: apicids 64,66,68,70
physical id 9: apicids 72,74,76,78
physical id 10: apicids 80,82,84,86
physical id 11: apicids 88,90,92,94
physical id 12: apicids 96,98,100,102
physical id 13: apicids 104,106,108,110
physical id 14: apicids 112,114,116,118
physical id 15: apicids 120,122,124,126
physical id 16: apicids 128,130,132,134
physical id 17: apicids 136,138,140,142
physical id 18: apicids 144,146,148,150
physical id 19: apicids 152,154,156,158
physical id 20: apicids 160,162,164,166
physical id 21: apicids 168,170,172,174
physical id 22: apicids 176,178,180,182
physical id 23: apicids 184,186,188,190
physical id 24: apicids 192,194,196,198
physical id 25: apicids 200,202,204,206
physical id 26: apicids 208,210,212,214
physical id 27: apicids 216,218,220,222
physical id 28: apicids 224,226,228,230
physical id 29: apicids 232,234,236,238
physical id 30: apicids 240,242,244,246
physical id 31: apicids 248,250,252,254
physical id 32: apicids 256,258,260,262
physical id 33: apicids 264,266,268,270
physical id 34: apicids 272,274,276,278
physical id 35: apicids 280,282,284,286
physical id 64: apicids 512,514,516,518
physical id 65: apicids 520,522,524,526
physical id 66: apicids 528,530,532,534
physical id 67: apicids 536,538,540,542
physical id 68: apicids 544,546,548,550
physical id 69: apicids 552,554,556,558
physical id 70: apicids 560,562,564,566
physical id 71: apicids 568,570,572,574
physical id 72: apicids 576,578,580,582
physical id 73: apicids 584,586,588,590
physical id 74: apicids 592,594,596,598
physical id 75: apicids 600,602,604,606
physical id 76: apicids 608,610,612,614
physical id 77: apicids 616,618,620,622
physical id 78: apicids 624,626,628,630
physical id 79: apicids 632,634,636,638
physical id 80: apicids 640,642,644,646
physical id 81: apicids 648,650,652,654
physical id 82: apicids 656,658,660,662
physical id 83: apicids 664,666,668,670
```

(Continued on next page)

Platform Notes (Continued)

```
    physical id 84: apicids 672,674,676,678
    physical id 85: apicids 680,682,684,686
    physical id 86: apicids 688,690,692,694
    physical id 87: apicids 696,698,700,702
    physical id 88: apicids 704,706,708,710
    physical id 89: apicids 712,714,716,718
    physical id 90: apicids 720,722,724,726
    physical id 91: apicids 728,730,732,734
    physical id 92: apicids 736,738,740,742
    physical id 93: apicids 744,746,748,750
    physical id 94: apicids 752,754,756,758
    physical id 95: apicids 760,762,764,766
    physical id 96: apicids 768,770,772,774
    physical id 97: apicids 776,778,780,782
    physical id 98: apicids 784,786,788,790
    physical id 99: apicids 792,794,796,798
  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, 48 bits virtual
  Byte Order:                      Little Endian
  CPU(s):                          288
  On-line CPU(s) list:             0-287
  Vendor ID:                       GenuineIntel
  Model name:                      Intel(R) Xeon(R) 6780E
  CPU family:                      6
  Model:                           175
  Thread(s) per core:              1
  Core(s) per socket:              4
  Socket(s):                       72
  Stepping:                        3
  Frequency boost:                 enabled
  CPU max MHz:                     2201.0000
  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 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 cdp_l2
                                   ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust bmi1 avx2 smep
                                   bmi2 erms invpcid cqm rdt_a rdseed adx smap clflushopt clwb intel_pt
                                   sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                                   cqm_mbm_local avx_vnni wbnoinvd dtherm ida arat pln pts umip pku ospke
                                   waitpkg gfni vaes vpclmulqdq tme rdpid bus_lock_detect cldemote movdiri
                                   movdir64b enqcmd fsrm md_clear serialize pconfig arch_lbr flush_l1d
                                   arch_capabilities
  L1d cache:                       9 MiB (288 instances)
  L1i cache:                       18 MiB (288 instances)
  L2 cache:                        288 MiB (72 instances)
  L3 cache:                        216 MiB (2 instances)
  NUMA node(s):                    2
```

(Continued on next page)

Platform Notes (Continued)

```
  NUMA node0 CPU(s):                0-143
  NUMA node1 CPU(s):                144-287
  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, PBRSB-eIBRS Not
                                    affected
  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       32K       9M    8 Data            1     64        1             64
     L1i       64K      18M    8 Instruction     1    128        1             64
     L2         4M     288M   16 Unified         2   4096        1             64
     L3       108M     216M   12 Unified         3 147456        1             64

------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0-143
  node 0 size: 515583 MB
  node 0 free: 514107 MB
  node 1 cpus: 144-287
  node 1 size: 515465 MB
  node 1 free: 514194 MB
  node distances:
  node   0   1
    0:  10  21
    1:  21  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1055794400 kB

------------------------------------------------------------
10. who -r
  run-level 3 Jul 9 04:34

------------------------------------------------------------
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          apparmor auditd cron firewalld getty@ irqbalance issue-generator kbdsettings kdump
                   kdump-early nvmefc-boot-connections postfix purge-kernels rollback sshd systemd-pstore
                   wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
  enabled-runtime  systemd-remount-fs
  disabled         boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell ebtables
                   exchange-bmc-os-info grub2-once haveged haveged-switch-root ipmievd issue-add-ssh-keys
                   kexec-load lunmask nfs nfs-blkmap nvmf-autoconnect rpcbind rpmconfigcheck serial-getty@
```

(Continued on next page)

Platform Notes (Continued)

```
                  systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                  systemd-time-wait-sync systemd-timesyncd
  indirect        wickedd

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
  root=UUID=a325eb06-40f4-4cc5-af19-3d970ad882af
  splash=silent
  mitigations=auto
  quiet
  security=apparmor
  crashkernel=487M,high
  crashkernel=72M,low

------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 800 MHz and 2.20 GHz.
                    The governor "ondemand" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes

------------------------------------------------------------
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+madvise [madvise] never
  enabled         [always] madvise 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
```

(Continued on next page)

Platform Notes (Continued)

```
  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/nvme0n1p2 btrfs  892G   65G  827G   8% /home

------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Product Family: Not specified
    Serial:         Not Filled

------------------------------------------------------------
21. 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:
    16x Samsung M321R8GA0PB2-CCPEC 64 GB 2 rank 6400


------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       American Megatrends International, LLC.
   BIOS Version:      00.14.00
   BIOS Date:         06/21/2024
   BIOS Revision:     5.35
```

Compiler Version Notes

```
==============================================================================================================
C       | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
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)
--------------------------------------------------------------------------------------------------------------
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==============================================================================================================
C       | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------------------
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```

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Compiler Version Notes (Continued)

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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)
------------------------------------------------------------------------------------------------------------------------
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==============================================================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
        | 541.leela_r(base, peak)
------------------------------------------------------------------------------------------------------------------------
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==============================================================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------------------------------------------------
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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

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Base Portability Flags (Continued)

557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xsierraforest -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 -xsierraforest -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 -xsierraforest -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

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

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Peak Portability Flags (Continued)

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:

500.perlbench_r: -w -std=c11 -m64 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2 -flto
-Ofast -ffast-math -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fno-strict-overflow
-L/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc

502.gcc_r: -m32 -L/opt/intel/oneapi/compiler/2024.1/lib32 -std=gnu89
-Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2 -flto
-Ofast -ffast-math -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc32-5.0.1/lib
-ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xsierraforest -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fno-alias
-L/opt/intel/oneapi/compiler/2024.1/lib -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:

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Peak Optimization Flags (Continued)

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-ic2024-official-linux64.html
http://www.spec.org/cpu2017/flags/IEIT-Platform-Settings-intel-V1.0.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml
http://www.spec.org/cpu2017/flags/IEIT-Platform-Settings-intel-V1.0.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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