SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMERGY RX1330 M6,
Intel Xeon E-2488, 3.2 GHz

$SPECrate^{®}2017_int_base = $ 98.0

$SPECrate^{®}2017_int_peak = $ Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Apr-2024
Hardware Availability: Apr-2024
Software Availability: Dec-2023

Copies		
500.perlbench_r	16	75.7
502.gcc_r	16	80.5
505.mcf_r	16	160
520.omnetpp_r	16	57.4
523.xalancbmk_r	16	144
525.x264_r	16	204
531.deepsjeng_r	16	75.7
541.leela_r	16	71.5
548.exchange2_r	16	193
557.xz_r	16	47.3

—— SPECrate®2017_int_base (98.0)

Hardware

CPU Name: Intel Xeon E-2488
 Max MHz: 5600
 Nominal: 3200
Enabled: 8 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 24 MB I+D on chip per chip
 Other: None
Memory: 64 GB (2 x 32 GB 2Rx8 PC5-4800B-E,
  running at 4400)
Storage: 1 x SATA M.2 SSD, 960 GB
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP5
 5.14.21-150500.53-default
Compiler: C/C++: Version 2024.0.2 of Intel oneAPI
 DPC++/C++ Compiler for Linux;
 Fortran: Version 2024.0.2 of Intel Fortran
 Compiler for Linux;
Parallel: No
Firmware: Fujitsu BIOS Version V5.0.0.27 R1.5.0 for
 D4133-A1x. Released Jul-2024
 tested as V5.0.0.27 R1.0.0 for D4133-A1x Mar-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 prefer performance
 at the cost of additional power usage

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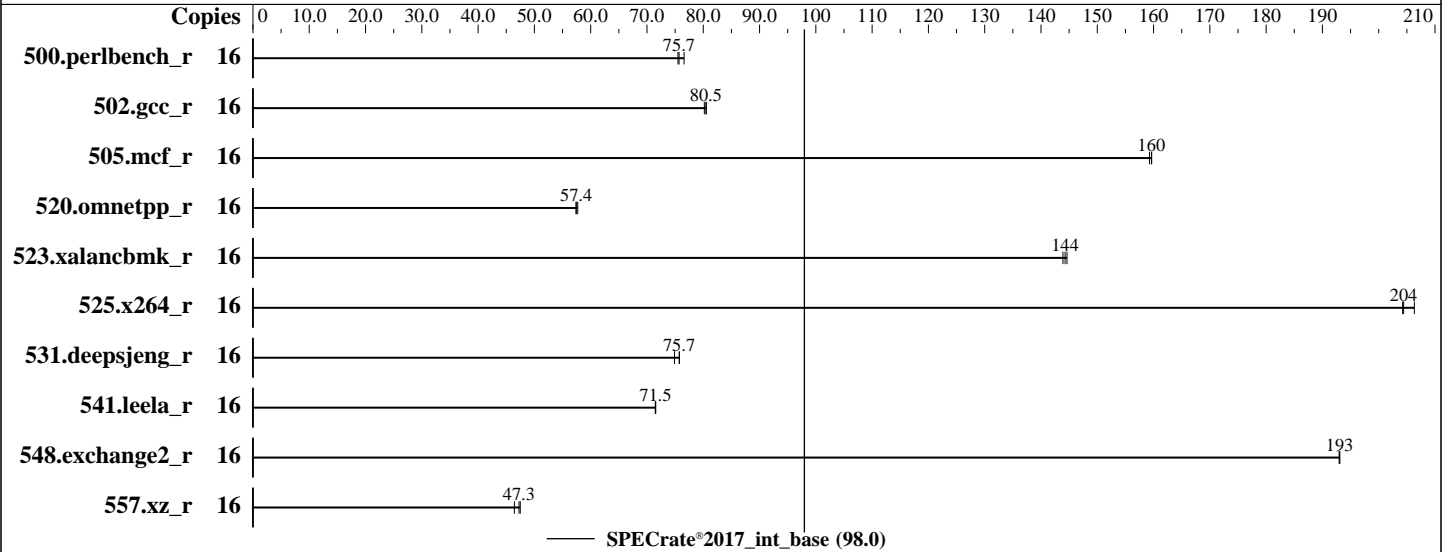SPECrate®2017_int_peak = Not Run

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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	16	333	76.6	**336**	**75.7**	337	75.5							
502.gcc_r	16	281	80.5	283	80.2	**282**	**80.5**							
505.mcf_r	16	**162**	**160**	162	160	162	159							
520.omnetpp_r	16	366	57.4	364	57.7	**365**	**57.4**							
523.xalancbmk_r	16	117	145	117	144	**117**	**144**							
525.x264_r	16	136	206	**137**	**204**	137	204							
531.deepsjeng_r	16	242	75.8	**242**	**75.7**	245	74.9							
541.leela_r	16	371	71.5	**370**	**71.5**	370	71.5							
548.exchange2_r	16	**217**	**193**	217	193	217	193							
557.xz_r	16	372	46.4	364	47.5	**366**	**47.3**							
SPECrate®2017_int_base =	**98.0**													
SPECrate®2017_int_peak =	Not Run													

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

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate taskset 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"

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
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.

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Platform Notes

```
BIOS configuration:
Fan Control = Full
Intel(R) Turbo Boost Max Technology 3.0 = Disabled
Total Memory Encryption = Disabled


Sysinfo program /home/Benchmark/speccpu/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Apr  2 05:43:21 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 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
   05:43:21 up 18:33,  2 users,  load average: 4.23, 12.21, 14.66
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                Mon11  18:21m 1.42s  0.35s -bash
  root     tty2     -                Mon14   7:16m 0.06s  0.06s -bash

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


------------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) unlimited
  data seg size           (kbytes, -d) unlimited
```

(Continued on next page)

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CPU2017 License:	19	**Test Date:**	Apr-2024
Test Sponsor:	Fujitsu	**Hardware Availability:**	Apr-2024
Tested by:	Fujitsu	**Software Availability:**	Dec-2023

Platform Notes (Continued)

```
  scheduling priority             (-e) 0
  file size            (blocks, -f) unlimited
  pending signals                 (-i) 254564
  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) 254564
  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=16 -c
   ic2024.0.2-lin-core-avx2-rate-20231213.cfg --define smt-on --define cores=8 --define physicallogical
   --define no-numa --tune base -o all --define drop_caches intrate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 --configfile
   ic2024.0.2-lin-core-avx2-rate-20231213.cfg --define smt-on --define cores=8 --define physicallogical
   --define no-numa --tune base --output_format all --define drop_caches --nopower --runmode rate --tune base
   --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/Benchmark/speccpu


  ----------------------------------------------------------
6. /proc/cpuinfo
   model name      : Intel(R) Xeon(R) E E-2488
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 183
   stepping        : 1
   microcode       : 0x121
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
   cpu cores       : 8
   siblings        : 16
   1 physical ids (chips)
   16 processors (hardware threads)
   physical id 0: core ids 0-7
   physical id 0: apicids 0-15
  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, 48 bits virtual
   Byte Order:                Little Endian
   CPU(s):                    16
   On-line CPU(s) list:       0-15
```

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Platform Notes (Continued)

```
   Vendor ID:                GenuineIntel
   Model name:               Intel(R) Xeon(R) E E-2488
   CPU family:               6
   Model:                    183
   Thread(s) per core:       2
   Core(s) per socket:       8
   Socket(s):                1
   Stepping:                 1
   CPU max MHz:              7200.0000
   CPU min MHz:              800.0000
   BogoMIPS:                 6374.40
   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 sse4_1 sse4_2
                             x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm
                             abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd ibrs ibpb stibp
                             ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase
                             tsc_adjust bmi1 avx2 smep bmi2 erms invpcid rdseed adx smap clflushopt
                             clwb intel_pt sha_ni xsaveopt xsavec xgetbv1 xsaves split_lock_detect
                             avx_vnni dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp
                             hwp_pkg_req hfi umip pku ospke waitpkg gfni vaes vpclmulqdq tme rdpid
                             movdiri movdir64b fsrm md_clear serialize pconfig arch_lbr flush_l1d
                             arch_capabilities
   Virtualization:           VT-x
   L1d cache:                384 KiB (8 instances)
   L1i cache:                256 KiB (8 instances)
   L2 cache:                 16 MiB (8 instances)
   L3 cache:                 24 MiB (1 instance)
   NUMA node(s):             1
   NUMA node0 CPU(s):        0-15
   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 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      384K  12 Data            1    64      1             64
     L1i      32K      256K   8 Instruction     1    64      1             64
     L2        2M       16M  16 Unified         2  2048      1             64
     L3       24M       24M  12 Unified         3 32768      1             64

   ------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 1 nodes (0)
   node 0 cpus: 0-15
   node 0 size: 63670 MB
   node 0 free: 63078 MB
   node distances:
```

(Continued on next page)

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Platform Notes (Continued)

```
     node   0
       0:   10


   -----------------------------------------------------------
   9. /proc/meminfo
     MemTotal:       65198988 kB


   -----------------------------------------------------------
   10. who -r
     run-level 3 Apr 1 11:10


   -----------------------------------------------------------
   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 display-manager getty@ irqbalance
                       iscsi issue-generator kbdsettings kdump kdump-early klog libvirtd lvm2-monitor nscd
                       postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked wickedd-auto4
                       wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
     enabled-runtime   systemd-remount-fs
     disabled          autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                       chronyd console-getty cups cups-browsed debug-shell dnsmasq ebtables exchange-bmc-os-info
                       firewalld gpm grub2-once haveged haveged-switch-root ipmi ipmievd iscsi-init iscsid
                       issue-add-ssh-keys kexec-load ksm kvm_stat libvirt-guests lunmask man-db-create multipathd
                       nfs nfs-blkmap nfs-server nfsserver rpcbind rpmconfigcheck rsyncd serial-getty@
                       smartd_generate_opts snmpd snmptrapd strongswan strongswan-starter svnserve
                       systemd-boot-check-no-failures systemd-network-generator systemd-nspawn@ systemd-sysext
                       systemd-time-wait-sync systemd-timesyncd tcsd tuned udisks2 virtinterfaced virtnetworkd
                       virtnodedevd virtnwfilterd virtproxyd virtqemud virtsecretd virtstoraged vncserver@
     indirect          pcscd virtlockd virtlogd wickedd

   -----------------------------------------------------------
   13. Linux kernel boot-time arguments, from /proc/cmdline
     BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
     root=UUID=b3265823-ba87-4e42-87d0-25e99edb5ca6
     splash=silent
     resume=/dev/disk/by-uuid/a5855c9d-a4a0-4b74-baec-bd075bde416b
     mitigations=auto
     quiet
     security=apparmor
     crashkernel=309M,high
     crashkernel=72M,low

   -----------------------------------------------------------
   14. cpupower frequency-info
     analyzing CPU 0:
       current policy: frequency should be within 800 MHz and 6.90 GHz.
                       The governor "powersave" may decide which speed to use
                       within this range.
       boost state support:
         Supported: yes
         Active: yes


   -----------------------------------------------------------
   15. tuned-adm active
     Current active profile: balanced
```

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Platform Notes (Continued)

```
          -------------------------------------------------------------
          16. sysctl
            kernel.numa_balancing             0
            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


          -------------------------------------------------------------
          17. /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


          -------------------------------------------------------------
          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/Benchmark/speccpu
            Filesystem     Type  Size  Used Avail Use% Mounted on
            /dev/sda3      xfs   791G   21G  771G   3% /home


          -------------------------------------------------------------
          21. /sys/devices/virtual/dmi/id
              Vendor:         FUJITSU
              Product:        PRIMERGY RX1330 M6
              Product Family: SERVER
              Serial:         xxxxxxxxxx


          -------------------------------------------------------------
          22. 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:
     2x Samsung M324R4GA3BB0-CQKOD 32 GB 2 rank 4800, configured at 4400


   ------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       FUJITSU // American Megatrends International, LLC.
   BIOS Version:      V5.0.0.27 R1.0.0 for D4133-A1x
   BIOS Date:         03/13/2024
   BIOS Revision:     1.0
```

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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
Fortran | 548.exchange2_r(base)
--------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

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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 -xCORE-AVX2 -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/opt/intel/oneapi/compiler/2024.0/lib -lqkmalloc`

C++ benchmarks:
`-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/opt/intel/oneapi/compiler/2024.0/lib -lqkmalloc`

Fortran benchmarks:
`-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-nostandard-realloc-lhs -align array32byte -auto`
`-L/opt/intel/oneapi/compiler/2024.0/lib -lqkmalloc`

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/Fujitsu-Platform-Settings-V1.0-RPL-RevA.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/Fujitsu-Platform-Settings-V1.0-RPL-RevA.xml

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

Tested with SPEC CPU®2017 v1.1.9 on 2024-04-01 16:43:21-0400.
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