# SPEC CPU®2026 Integer Rate Result

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## Fsas Technologies Inc.

(Test Sponsor: Fujitsu)

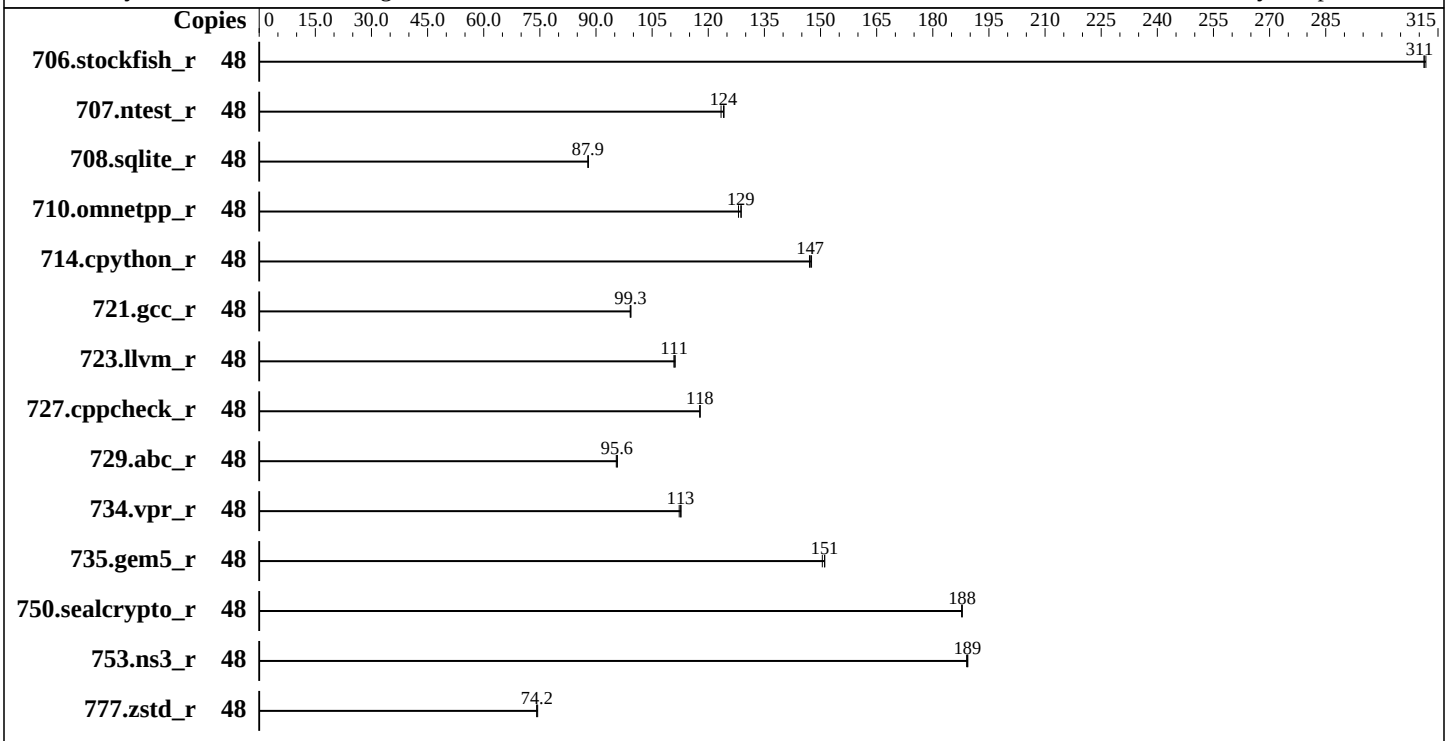
PRIMERGY RX2540 M8, Intel Xeon 6505P, 2.20GHz

SPECrate®2026_int_base = 129

SPECrate®2026_int_peak = Not Run

**CPU2026 License:** 19
**Test Sponsor:** Fujitsu
**Tested by:** Fsas Technologies Inc.

**Test Date:** Jun-2026
**Hardware Availability:** Oct-2025
**Software Availability:** Apr-2026




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon 6505P |
| Max MHz: | 4100 |
| Nominal: | 2200 |
| Enabled: | 24 cores, 2 chips, 2 threads/core |
| Orderable: | 1,2 chips |
| Cache L1: | 64 KB I + 48 KB D on chip per core |
| L2: | 2 MB I+D on chip per core |
| L3: | 48 MB I+D on chip per chip |
| Other: | None |
| Memory: | 512 GB (16 x 32 GB 2Rx8 PC5-6400B-R) |
| Storage: | 1 x PCIe SSD, 1.92TB |
| Cooling: | Air |
| Other: | None |

## Software

| | |
|---|---|
| OS: | SUSE Linux Enterprise Server 15 SP7 6.4.0-150700.51-default |
| Compiler: | C/C++: Version 2026.0 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2026.0 of Intel Fortran Compiler for Linux |
| Compiler Category: | Vendor |
| Firmware: | Fsas Technologies Inc. BIOS Version V1.0.0.0 R1.5.0 for D4135-A1x. Released Apr-2026 |
| File System: | btrfs |
| 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 |
| 706.stockfish_r | 48 | 194 | 312 | 194 | 311 | **194** | **311** | | | | | | | |
| 707.ntest_r | 48 | 230 | 123 | **229** | **124** | 229 | 124 | | | | | | | |
| 708.sqlite_r | 48 | **288** | **87.9** | 288 | 88.0 | 288 | 87.9 | | | | | | | |
| 710.omnetpp_r | 48 | 181 | 129 | **181** | **129** | 182 | 128 | | | | | | | |
| 714.cpython_r | 48 | 156 | 148 | 156 | 147 | **156** | **147** | | | | | | | |
| 721.gcc_r | 48 | 332 | 99.3 | 332 | 99.1 | **332** | **99.3** | | | | | | | |
| 723.llvm_r | 48 | **219** | **111** | 220 | 111 | 219 | 111 | | | | | | | |
| 727.cppcheck_r | 48 | 146 | 118 | **146** | **118** | 146 | 118 | | | | | | | |
| 729.abc_r | 48 | **230** | **95.6** | 230 | 95.7 | 231 | 95.4 | | | | | | | |
| 734.vpr_r | 48 | **197** | **113** | 197 | 112 | 196 | 113 | | | | | | | |
| 735.gem5_r | 48 | **155** | **151** | 155 | 150 | 155 | 151 | | | | | | | |
| 750.sealcrypto_r | 48 | 137 | 188 | **137** | **188** | 137 | 188 | | | | | | | |
| 753.ns3_r | 48 | 156 | 189 | 155 | 189 | **155** | **189** | | | | | | | |
| 777.zstd_r | 48 | 415 | 74.4 | **417** | **74.2** | 417 | 74.2 | | | | | | | |

**SPECrate®2026_int_base = 129**

**SPECrate®2026_int_peak = Not Run**

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/Benchmark/cpu2026/lib"
MALLOC_CONF = "retain:true"
```

## General Notes

```
Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using CentOS Stream 9.
Transparent Huge Pages enabled by default
Prior to runcpu invocation
```

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## General Notes (Continued)

```
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>
```

## Platform Notes

```
BIOS Settings:
Fan Control = Full
CPU Performance Boost = Aggressive
UPI Link Frequency Select = 16.0GT/s
APS rocketing = Enabled

Sysinfo program /home/Benchmark/cpu2026/bin/sysinfo
Rev: 779ab21020787073335a329f3a45e2cd
running on localhost Thu Jun 18 23:06:27 2026

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

------------------------------------------------------------
Table of contents
------------------------------------------------------------
 1. uname -srvm
 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 254 (254.24+suse.148.g83b9060b6e)
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
------------------------------------------------------------
```

**(Continued on next page)**

## Platform Notes (Continued)

```
------------------------------------------------------------
1. uname -srvm
  Linux 6.4.0-150700.51-default #1 SMP PREEMPT_DYNAMIC Wed Apr 30 21:35:43 UTC 2025 (6930611) x86_64

------------------------------------------------------------
2. w
   23:06:27 up 1 min,  1 user,  load average: 0.39, 0.29, 0.11
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     pts/0    192.168.10.106   23:05   11.00s  1.47s  0.12s -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) 2062449
  max locked memory       (kbytes, -l) 8192
  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) 2062449
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize=30
 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
 sshd: root [priv]
 sshd: root@pts/0
 -bash
 -bash
 runcpu --nobuild --action validate --define default-platform-flags --copies 48 -c
   ic2026.0-graniterapids-cpu2026-1.0.1-rate-20260429.cfg --define smt-on --define cores=24 --define
   physicalfirst --define invoke_with_interleave --define drop_caches --tune base -o all -n 3 intrate
 runcpu --nobuild --action validate --define default-platform-flags --copies 48 --configfile
   ic2026.0-graniterapids-cpu2026-1.0.1-rate-20260429.cfg --define smt-on --define cores=24 --define
   physicalfirst --define invoke_with_interleave --define drop_caches --tune base --output_format all
```

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## Platform Notes (Continued)

```
   --iterations 3 --nopower --runmode rate --tune base --size refrate intrate --nopreenv --note-preenv
   --logfile $SPEC/tmp/CPU2026.002/templogs/preenv.intrate.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/Benchmark/cpu2026

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) 6505P
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 173
    stepping        : 1
    microcode       : 0x1000405
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
    cpu cores       : 12
    siblings        : 24
    2 physical ids (chips)
    48 processors (hardware threads)
    physical id 0: core ids 0-11
    physical id 1: core ids 0-11
    physical id 0: apicids 0-23
    physical id 1: apicids 128-151
  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 2.40.4:
  Architecture:                         x86_64
  CPU op-mode(s):                       32-bit, 64-bit
  Address sizes:                        52 bits physical, 57 bits virtual
  Byte Order:                           Little Endian
  CPU(s):                               48
  On-line CPU(s) list:                  0-47
  Vendor ID:                            GenuineIntel
  Model name:                           Intel(R) Xeon(R) 6505P
  CPU family:                           6
  Model:                                173
  Thread(s) per core:                   2
  Core(s) per socket:                   12
  Socket(s):                            2
  Stepping:                             1
  CPU(s) scaling MHz:                   24%
  CPU max MHz:                          4100.0000
  CPU min MHz:                          800.0000
  BogoMIPS:                             4400.00
```

**(Continued on next page)**

## Platform Notes (Continued)

```
  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 intel_ppin cdp_l2
                                   ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow 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 user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida
                                   arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req vnmi 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 ibt amx_bf16 avx512_fp16 amx_tile amx_int8 flush_l1d
                                            arch_capabilities
   Virtualization:                          VT-x
   L1d cache:                               1.1 MiB (24 instances)
   L1i cache:                               1.5 MiB (24 instances)
   L2 cache:                                48 MiB (24 instances)
   L3 cache:                                96 MiB (2 instances)
   NUMA node(s):                            2
   NUMA node0 CPU(s):                       0-11,24-35
   NUMA node1 CPU(s):                       12-23,36-47
   Vulnerability Gather data sampling:      Not affected
   Vulnerability Itlb multihit:             Not affected
   Vulnerability L1tf:                      Not affected
   Vulnerability Mds:                       Not affected
   Vulnerability Meltdown:                  Not affected
   Vulnerability Mmio stale data:           Not affected
   Vulnerability Reg file data sampling:    Not affected
   Vulnerability Retbleed:                  Not affected
   Vulnerability Spec rstack overflow:      Not affected
   Vulnerability Spec store bypass:         Mitigation; Speculative Store Bypass disabled via prctl
   Vulnerability Spectre v1:                Mitigation; usercopy/swapgs barriers and __user pointer sanitization
   Vulnerability Spectre v2:                Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling;
                                            PBRSB-eIBRS Not affected; BHI BHI_DIS_S
   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     1.1M   12 Data            1    64        1             64
```

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## Platform Notes (Continued)

```
      L1i       64K     1.5M   16 Instruction     1    64        1             64
      L2         2M      48M   16 Unified         2  2048        1             64
      L3        48M      96M   16 Unified         3 49152        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: 0-11,24-35
  node 0 size: 257610 MB
  node 0 free: 256761 MB
  node 1 cpus: 12-23,36-47
  node 1 size: 258029 MB
  node 1 free: 257248 MB
  node distances:
  node   0   1
    0:  10  21
    1:  21  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       528014656 kB

------------------------------------------------------------
10. who -r
  run-level 3 Jun 18 23:05

------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.24+suse.148.g83b9060b6e)
  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
                     issue-generator kbdsettings klog lvm2-monitor nscd nvmefc-boot-connections
                   nvmf-autoconnect postfix purge-kernels rollback rsyslog sep5 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 ebtables exchange-bmc-os-info
                   firewalld fsidd gpm grub2-once haveged ipmi ipmievd issue-add-ssh-keys kexec-load lunmask
                    man-db-create multipathd nfs nfs-blkmap rpcbind rpmconfigcheck rsyncd serial-getty@
                     smartd_generate_opts snmpd snmptrapd sysstat systemd-boot-check-no-failures
                    systemd-confext systemd-network-generator systemd-sysext systemd-time-wait-sync
                     systemd-timesyncd vncserver@
```

**(Continued on next page)**

## Platform Notes (Continued)

```
  indirect         systemd-userdbd wickedd

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-6.4.0-150700.51-default
  root=UUID=6490486a-f020-45c4-b83e-03e98fc56a3b
  splash=silent
  mitigations=auto
  quiet
  security=apparmor
  tsx=auto

------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 42:
    current policy: frequency should be within 800 MHz and 4.10 GHz.
                    The governor "powersave" 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
```

**(Continued on next page)**

## Platform Notes (Continued)

```
  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
  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 SP7

------------------------------------------------------------
19. Disk information
SPEC is set to: /home/Benchmark/cpu2026
  Filesystem     Type   Size  Used Avail Use% Mounted on
  /dev/nvme1n1p2 btrfs  1.9T  156G  1.8T   9% /home

------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:         Fsas Technologies
    Product:        PRIMERGY RX2540 M8
    Product Family: SERVER
    Serial:         xxxxxxxxxx

------------------------------------------------------------
21. dmidecode
  Additional information from dmidecode 3.6 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 Micron MTC20F2085S1RC64BD2 MWFF 32 GB 2 rank 6400


------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       Fsas Technologies
   BIOS Version:      V1.0.0.0 R1.5.0 for D4135-A1x
```

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## Platform Notes (Continued)

```
    BIOS Date:          03/06/2026
    BIOS Revision:      1.5
    Firmware Revision: 3.12
```

## Compiler Version Notes

```
==============================================================================
C      | 708.sqlite_r(base) 714.cpython_r(base) 777.zstd_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++    | 706.stockfish_r(base) 707.ntest_r(base) 727.cppcheck_r(base)
       | 753.ns3_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++, C | 710.omnetpp_r(base) 721.gcc_r(base) 723.llvm_r(base) 729.abc_r(base)
       | 734.vpr_r(base) 735.gem5_r(base) 750.sealcrypto_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

# Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Benchmarks using both C and C++:
icpx icx

## Base Optimization Flags

C benchmarks:
```
-m64 -std=c18 -Wl,-z,muldefs -Wl,-plugin-opt=-inline-threshold=1500
-xgraniterapids -mprefer-vector-width=512 -O3 -ffp-model=fast -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-fno-strict-aliasing -L/opt/intel/oneapi/compiler/2026.0/lib -lqkmalloc
```

C++ benchmarks:
```
-m64 -std=c++17 -Wl,-z,muldefs -Wl,-plugin-opt=-inline-threshold=1500
-xgraniterapids -mprefer-vector-width=512 -O3 -ffp-model=fast -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/opt/intel/oneapi/compiler/2026.0/lib -lqkmalloc
```

Benchmarks using both C and C++:
```
-m64 -std=c++17 -std=c18 -Wl,-z,muldefs
-Wl,-plugin-opt=-inline-threshold=1500 -xgraniterapids
-mprefer-vector-width=512 -O3 -ffp-model=fast -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -fno-strict-aliasing
-L/opt/intel/oneapi/compiler/2026.0/lib -lqkmalloc
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2026/results/flags/Intel-ic2026-official-linux64-v1.1.html
http://www.spec.org/cpu2026/results/flags/Fsas-Platform-Settings-V1.0-GNR-RevC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2026/results/flags/Intel-ic2026-official-linux64-v1.1.xml
http://www.spec.org/cpu2026/results/flags/Fsas-Platform-Settings-V1.0-GNR-RevC.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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