SPECaccel®2023 Result

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Intel
Intel Xeon 6980P

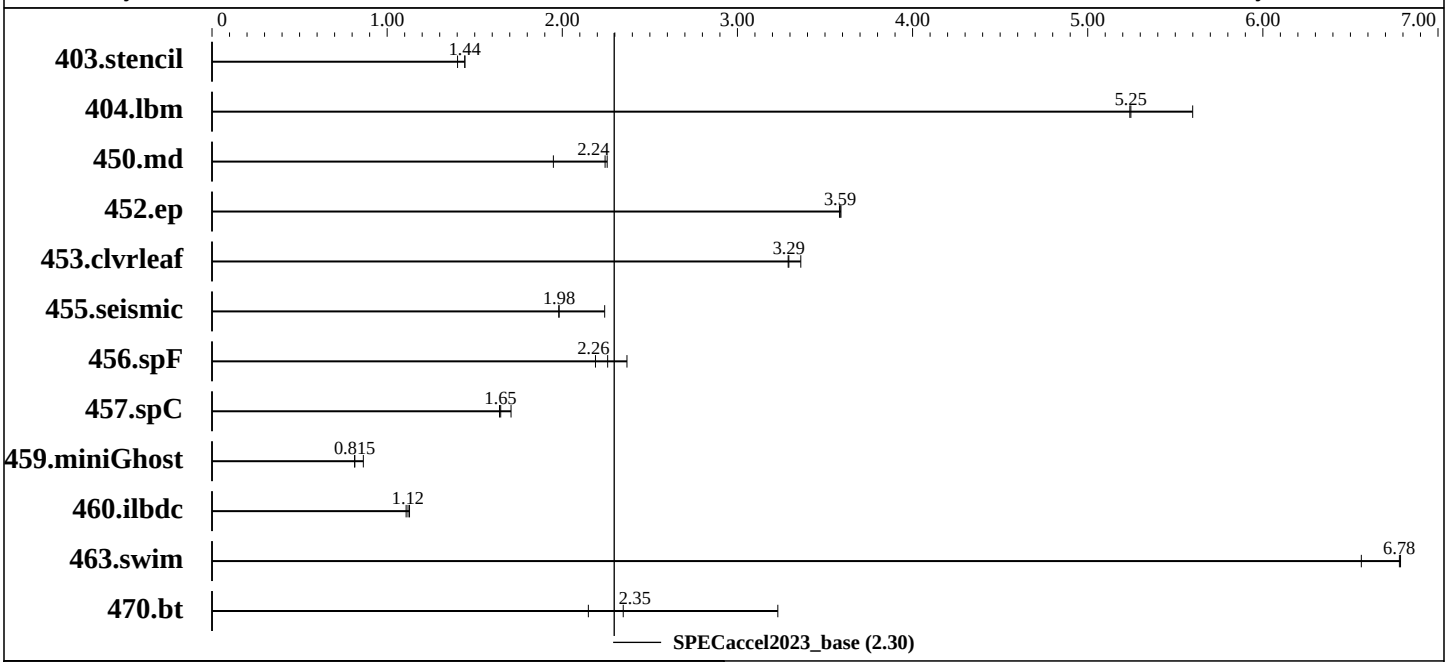
Supermicro SYS-222HA-TN (2 x Intel Xeon 6980P, 2.0GHz)

SPECaccel 2023_base = 2.30

SPECaccel 2023_peak = Not Run

accel2023 License: 13
Test Sponsor: Intel
Tested by: Intel

Test Date: Aug-2025
Hardware Availability: Sep-2024
Software Availability: Jun-2025



Hardware

CPU Name:	Intel Xeon 6980P
Max MHz.:	3900
Nominal:	2000
Enabled:	256 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:	504 MB I+D on chip per chip
Other:	None
Memory:	1536 GB (24 x 64 GB 2Rx4 PC5-8800X)
Storage:	1 x 3.5 TB NVMe SSD
Other:	None
Base Threads Run:	512
Min. Peak Threads:	--
Max. Peak Threads:	--

Accelerator

Accel Model Name:	Intel Xeon 6980P
Accel Vendor:	Intel
Accel Name:	Intel Xeon 6980P
Type of Accel:	CPU
Accel Connection:	N/A
Does Accel Use ECC:	yes
Accel Description:	Intel Xeon 6980P SMT ON, Turbo ON
Accel Driver:	None

Software

OS:	Ubuntu 22.04.5 LTS Ubuntu 22.04.5 LTS 6.5.0-21-generic
Compiler:	Intel oneAPI Compiler 2025.2
Firmware:	SE5C7411.86B.9533.D01.2310110651
File System:	ext4
System State:	Run level 5
Other:	None
Base Parallel Model:	SMD
Base Threads Run:	512

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Software (Continued)

Peak Parallel Models: Not Run
Max. Peak Threads: --
Min. Peak Threads: --

Results Table

Benchmark	Base							Peak						
	Model	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
403.stencil	SMD	**305**	**1.44**	305	1.44	314	1.40							
404.lbm	SMD	86.8	5.24	**86.7**	**5.25**	81.3	5.60							
450.md	SMD	308	1.95	**267**	**2.24**	266	2.26							
452.ep	SMD	**116**	**3.59**	116	3.58	116	3.59							
453.clvrleaf	SMD	297	3.36	**304**	**3.29**	304	3.29							
455.seismic	SMD	394	1.98	**394**	**1.98**	348	2.24							
456.spF	SMD	**210**	**2.26**	200	2.37	217	2.19							
457.spC	SMD	316	1.71	329	1.64	**328**	**1.65**							
459.miniGhost	SMD	683	0.864	**724**	**0.815**	724	0.815							
460.ilbdc	SMD	492	1.13	501	1.11	**496**	**1.12**							
463.swim	SMD	67.1	6.56	64.8	6.79	**64.9**	**6.78**							
470.bt	SMD	**449**	**2.35**	491	2.15	327	3.23							

SPEC accel2023_base = 2.30

SPEC accel2023_peak = Not Run

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

General Notes

```
Environment variables set by runaccel before the start of the run:
FORT_BUFFERED = "true"
KMP_AFFINITY = "compact,0,granularity=thread"
KMP_BLOCKTIME = "infinite"
KMP_HW_SUBSET = "2S,128C,2T"
KMP_LIBRARY = "turnaround"
KMP_STACKSIZE = "8M"
OMP_DYNAMIC = "FALSE"
OMP_WAIT_POLICY = "active"
```

Platform Notes

```
Sysinfo program /root/knektyag/accel2023-2.0.18/bin/sysinfo
Rev: r6622 of 2021-04-07 b1a7d5f8f71be5aff70a755cad7211a0
running on SMCAP5 Tue Aug 19 08:38:47 2025

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

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Platform Notes (Continued)

```
For more information on this section, see
   https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) 6980P
      2  "physical id"s (chips)
      512 "processors"
   cores, siblings (Caution: counting these is hw and system dependent. The following
   excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
      cpu cores : 128
      siblings  : 256
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
      25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 64 65 66 67 68 69 70 71 72 73
      74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
      101 102 103 104 105 106 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142
      143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163
      164 165 166 167 168 169
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
      25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 64 65 66 67 68 69 70 71 72 73
      74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
      101 102 103 104 105 106 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142
      143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163
      164 165 166 167 168 169

From lscpu from util-linux 2.37.2:
     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):                               512
     On-line CPU(s) list:                  0-511
     Vendor ID:                            GenuineIntel
     Model name:                           Intel(R) Xeon(R) 6980P
     CPU family:                           6
     Model:                                173
     Thread(s) per core:                   2
     Core(s) per socket:                   128
     Socket(s):                            2
     Stepping:                             1
     BogoMIPS:                             4000.00
     Flags:                               fpu vme de pse tsc msr pae mce cx8 apic sep mtrr
     pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx
     pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
     nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx
     smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
     tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault
     epb cat_l3 cat_l2 cdp_l3 invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp
```

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Platform Notes (Continued)

```
      ibrs_enhanced tpr_shadow flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2
      smep bmi2 erms invpcid 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 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:                         12 MiB (256 instances)
      L1i cache:                         16 MiB (256 instances)
      L2 cache:                          512 MiB (256 instances)
      L3 cache:                          1008 MiB (2 instances)
      NUMA node(s):                      6
      NUMA node0 CPU(s):                 0-42,256-298
      NUMA node1 CPU(s):                 43-85,299-341
      NUMA node2 CPU(s):                 86-127,342-383
      NUMA node3 CPU(s):                 128-170,384-426
      NUMA node4 CPU(s):                 171-213,427-469
      NUMA node5 CPU(s):                 214-255,470-511
      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 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
      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      12M   12 Data            1     64        1             64
      L1i       64K      16M   16 Instruction     1     64        1             64
      L2         2M     512M   16 Unified         2   2048        1             64
      L3       504M    1008M   16 Unified         3 516096        1             64

  /proc/cpuinfo cache data
     cache size : 516096 KB
```

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Platform Notes (Continued)

```
From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 6 nodes (0-5)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
  28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 256 257 258 259 260 261 262 263 264 265
  266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287
  288 289 290 291 292 293 294 295 296 297 298
  node 0 size: 257534 MB
  node 0 free: 255297 MB
  node 1 cpus: 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
  68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 299 300 301 302 303 304 305 306
  307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328
  329 330 331 332 333 334 335 336 337 338 339 340 341
  node 1 size: 258026 MB
  node 1 free: 255204 MB
  node 2 cpus: 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107
  108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 342 343
  344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365
  366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383
  node 2 size: 258027 MB
  node 2 free: 257041 MB
  node 3 cpus: 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145
  146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167
  168 169 170 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402
  403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424
  425 426
  node 3 size: 257974 MB
  node 3 free: 256543 MB
  node 4 cpus: 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188
  189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210
  211 212 213 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445
  446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467
  468 469
  node 4 size: 258026 MB
  node 4 free: 256636 MB
  node 5 cpus: 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231
  232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253
  254 255 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489
  490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511
  node 5 size: 257999 MB
  node 5 free: 256835 MB
  node distances:
  node   0   1   2   3   4   5
    0:  10  12  12  21  21  21
    1:  12  10  12  21  21  21
    2:  12  12  10  21  21  21
```

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Platform Notes (Continued)

```
     3:  21  21  21  10  12  12
     4:  21  21  21  12  10  12
     5:  21  21  21  12  12  10

  From /proc/meminfo
     MemTotal:       1584730352 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  /usr/bin/lsb_release -d
     Ubuntu 22.04.5 LTS

  From /etc/*release* /etc/*version*
     debian_version: bookworm/sid
     os-release:
        PRETTY_NAME="Ubuntu 22.04.5 LTS"
        NAME="Ubuntu"
        VERSION_ID="22.04"
        VERSION="22.04.5 LTS (Jammy Jellyfish)"
        VERSION_CODENAME=jammy
        ID=ubuntu
        ID_LIKE=debian
        HOME_URL="https://www.ubuntu.com/"

  uname -a:
     Linux SMCAP5 6.5.0-21-generic #21~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Fri Feb  9
     13:32:52 UTC 2 x86_64 x86_64 x86_64 GNU/Linux

  Kernel self-reported vulnerability status:

  gather_data_sampling:                                  Not affected
  CVE-2018-12207 (iTLB Multihit):                        Not affected
  CVE-2018-3620 (L1 Terminal Fault):                     Not affected
  Microarchitectural Data Sampling:                      Not affected
  CVE-2017-5754 (Meltdown):                              Not affected
  mmio_stale_data:                                       Not affected
  retbleed:                                              Not affected
  spec_rstack_overflow:                                  Not affected
  CVE-2018-3639 (Speculative Store Bypass):              Mitigation: Speculative Store
                                                         Bypass disabled via prctl
  CVE-2017-5753 (Spectre variant 1):                     Mitigation: usercopy/swapgs
                                                         barriers and __user pointer
                                                         sanitization
  CVE-2017-5715 (Spectre variant 2):                    Mitigation: Enhanced / Automatic
                                                          IBRS, IBPB: conditional, RSB
                                                        filling, PBRSB-eIBRS: Not affected
  CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
```

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Platform Notes (Continued)

```
 CVE-2019-11135 (TSX Asynchronous Abort):              Not affected

 run-level 5 Aug 14 08:35

 SPEC is set to: /root/knektyag/accel2023-2.0.18
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/nvme0n1p2 ext4  1.8T  131G  1.6T   8% /

 From /sys/devices/virtual/dmi/id
     Vendor:         Supermicro
     Product:        SYS-222HA-TN
     Product Family: Family
     Serial:         S928613X4614555

 Additional information from dmidecode 3.3 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:
     24x Micron Technology MTC40F2046S1HC88XDY WCCCC 64 GB 2 rank 8800

 BIOS:
    BIOS Vendor:       American Megatrends International, LLC.
    BIOS Version:      1.2
    BIOS Date:         02/14/2025
    BIOS Revision:     5.35

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C           | 403.stencil(base) 404.lbm(base) 452.ep(base) 457.spC(base)
            | 470.bt(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2025.2.0 (2025.2.0.20250605)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2025.2/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2025.2/bin/compiler/../icx.cfg
------------------------------------------------------------------------------

==============================================================================
Fortran     | 450.md(base) 455.seismic(base) 456.spF(base) 460.ilbdc(base)
            | 463.swim(base)
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
ifx (IFX) 2025.2.0 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran, C | 453.clvrleaf(base) 459.miniGhost(base)
------------------------------------------------------------------------------
ifx (IFX) 2025.2.0 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler 2025.2.0 (2025.2.0.20250605)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2025.2/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2025.2/bin/compiler/../icx.cfg
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Base Portability Flags

450.md: -80
457.spC: -Wl,--no-relax(icx)(*) -shared-intel -Wl,--no-relax(icx)
459.miniGhost: -nofor-main

(*) Indicates a portability flag that was found in a non-portability variable.

Base Optimization Flags

C benchmarks:

403.stencil: -Ofast -O3 -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -flto -ffast-math

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Base Optimization Flags (Continued)

403.stencil (continued):
-fiopenmp -qopt-dynamic-align -fvec-peel-loops
-qopt-streaming-stores always -Xclang
-fopenmp-declare-target-scalar-defaultmap-firstprivate
-fimf-precision=low

404.lbm: Same as 403.stencil

452.ep: Same as 403.stencil

457.spC: -Ofast -O3 -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -flto -ffast-math
-fiopenmp -qopt-dynamic-align -fvec-peel-loops
-qopt-streaming-stores always -Xclang
-fopenmp-declare-target-scalar-defaultmap-firstprivate
-fimf-precision=low -mcmodel=medium(*)

470.bt: Same as 403.stencil

Fortran benchmarks:
-Ofast -O3 -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -flto -ffast-math -fiopenmp
-qopt-dynamic-align -fvec-peel-loops -qopt-streaming-stores always
-nostandard-realloc-lhs -align array32byte -auto
-fimf-accuracy-bits-sqrt=14 -fimf-precision=low

Benchmarks using both Fortran and C:
-Ofast -O3 -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -flto -ffast-math -fiopenmp
-qopt-dynamic-align -fvec-peel-loops -qopt-streaming-stores always
-Xclang -fopenmp-declare-target-scalar-defaultmap-firstprivate
-fimf-precision=low -nostandard-realloc-lhs -align array32byte -auto
-fimf-accuracy-bits-sqrt=14

(*) Indicates an optimization flag that was found in a portability variable.

The flags file that was used to format this result can be browsed at
http://www.spec.org/accel2023/flags/Intel_compiler_flags.2024-02-14.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/accel2023/flags/Intel_compiler_flags.2024-02-14.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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