# SPECaccel®2023 Result

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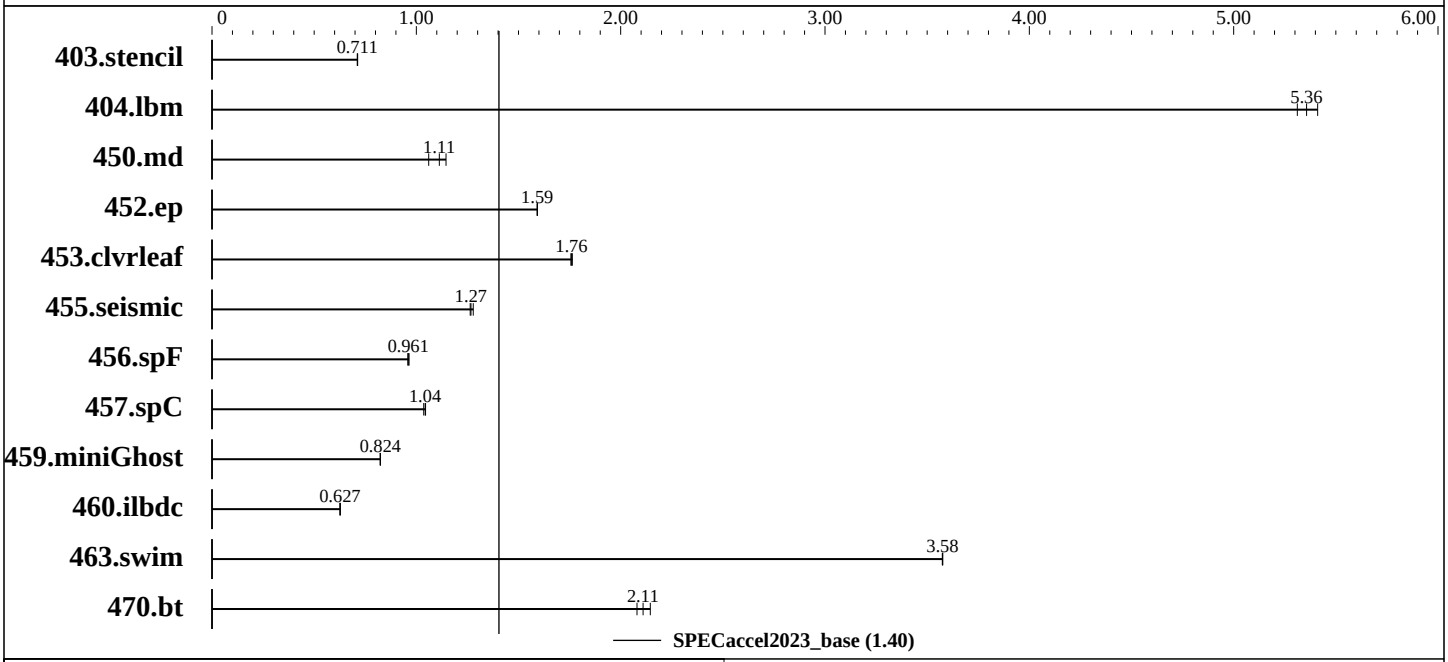
## Supermicro
## Intel Xeon Platinum 8592+
## SuperServer SYS-221H-TN24R

SPECaccel 2023_base = 1.40

SPECaccel 2023_peak = Not Run

**accel2023 License:** 001176
**Test Sponsor:** Supermicro
**Tested by:** Supermicro

**Test Date:** Dec-2023
**Hardware Availability:** Oct-2023
**Software Availability:** Nov-2023




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon Platinum 8592+ |
| Max MHz.: | 3900 |
| Nominal: | 1900 |
| Enabled: | 128 cores, 2 chips, 2 threads/core |
| Orderable: | 1,2 chips |
| Cache L1: | 32 KB I + 48 KB D on chip per core |
| L2: | 2 MB I+D on chip per core |
| L3: | 320 KB I+D on chip per chip |
| Other: | None |
| Memory: | 1 TB (16 x 64 GB 2Rx4 PC5-5600B-R) |
| Storage: | 1 x 960 GB NVMe SSD |
| Other: | None |
| Base Threads Run: | 256 |
| Min. Peak Threads: | -- |
| Max. Peak Threads: | -- |

### Accelerator

| | |
|---|---|
| Accel Model Name: | Intel Xeon Platinum 8592+ |
| Accel Vendor: | Intel |
| Accel Name: | Intel Xeon Platinum 8592+ |
| Type of Accel: | CPU |
| Accel Connection: | N/A |
| Does Accel Use ECC: | Yes |
| Accel Description: | 2 x Intel Xeon Platinum 8592+ |
| Accel Driver: | N/A |

### Software

| | |
|---|---|
| OS: | Ubuntu 22.04.3 LTS<br>6.2.0-39-generic |
| Compiler: | C/C++/Fortran: Version 2024.0 of Intel oneAPI DPC++/C++ |
| Firmware: | Version 2.0 released Oct-2023 |
| File System: | ext4 |
| System State: | Run level 3 (multi-user) |
| Other: | None |
| Base Parallel Model: | LOP |
| Base Threads Run: | 256 |

**(Continued on next page)**

## 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 | LOP | 619 | 0.711 | 617 | 0.713 | **619** | **0.711** | | | | | | | |
| 404.lbm | LOP | 84.1 | 5.41 | **84.9** | **5.36** | 85.7 | 5.31 | | | | | | | |
| 450.md | LOP | 566 | 1.06 | 524 | 1.15 | **539** | **1.11** | | | | | | | |
| 452.ep | LOP | 261 | 1.59 | 261 | 1.59 | **261** | **1.59** | | | | | | | |
| 453.clvrleaf | LOP | **568** | **1.76** | 569 | 1.76 | 567 | 1.76 | | | | | | | |
| 455.seismic | LOP | 610 | 1.28 | 617 | 1.26 | **615** | **1.27** | | | | | | | |
| 456.spF | LOP | 496 | 0.958 | 493 | 0.964 | **494** | **0.961** | | | | | | | |
| 457.spC | LOP | **518** | **1.04** | 517 | 1.05 | 521 | 1.04 | | | | | | | |
| 459.miniGhost | LOP | 717 | 0.823 | **716** | **0.824** | 716 | 0.824 | | | | | | | |
| 460.ilbdc | LOP | **885** | **0.627** | 886 | 0.626 | 884 | 0.628 | | | | | | | |
| 463.swim | LOP | **123** | **3.58** | 123 | 3.57 | 123 | 3.58 | | | | | | | |
| 470.bt | LOP | 492 | 2.15 | **500** | **2.11** | 507 | 2.08 | | | | | | | |

**SPEC accel2023_base = 1.40**

**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"
KMP_BLOCKTIME = "infinite"
KMP_HW_SUBSET = "2S,64C,2T"S
KMP_LIBRARY = "turnaround"
OMP_DYNAMIC = "FALSE"
OMP_NUM_THREADS = "128"
OMP_WAIT_POLICY = "active"

     is mitigated in the system as tested and documented.
    Yes: The test sponsor attests, as of date of publication, the 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.
==========================================================================
OS tunning:
    Stack size set to unlimited using "ulimit -s unlimited"
==========================================================================
```

## Platform Notes

```
Sysinfo program /home/accel/bin/sysinfo
Rev: r6622 of 2021-04-07 b1a7d5f8f71be5aff70a755cad7211a0
running on mingyuan-Super-Server Sun Dec 24 11:20:49 2023

SUT (System Under Test) info as seen by some common utilities.
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) PLATINUM 8592+
      2  "physical id"s (chips)
      256 "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 : 64
      siblings  : 128
      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 43 44 45 46 47 48 49 50 51 52
      53 54 55 56 57 58 59 60 61 62 63
      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 43 44 45 46 47 48 49 50 51 52
      53 54 55 56 57 58 59 60 61 62 63

From lscpu from util-linux 2.37.2:
     Architecture:                         x86_64
     CPU op-mode(s):                       32-bit, 64-bit
     Address sizes:                        46 bits physical, 57 bits virtual
     Byte Order:                           Little Endian
     CPU(s):                               256
     On-line CPU(s) list:                  0-255
     Vendor ID:                            GenuineIntel
     Model name:                           INTEL(R) XEON(R) PLATINUM 8592+
     CPU family:                           6
     Model:                                207
     Thread(s) per core:                   2
     Core(s) per socket:                   64
     Socket(s):                            2
     Stepping:                             2
     BogoMIPS:                             3800.00
     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 cdp_l2 ssbd mba ibrs ibpb stibp
```

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## Platform Notes (Continued)

```
      ibrs_enhanced tpr_shadow vnmi 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 avx_vnni avx512_bf16
      wbnoinvd dtherm ida arat pln pts 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:                         6 MiB (128 instances)
      L1i cache:                         4 MiB (128 instances)
      L2 cache:                          256 MiB (128 instances)
      L3 cache:                          640 MiB (2 instances)
      NUMA node(s):                      2
      NUMA node0 CPU(s):                 0-63,128-191
      NUMA node1 CPU(s):                 64-127,192-255
      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 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       6M   12 Data            1     64        1             64
      L1i       32K       4M    8 Instruction     1     64        1             64
      L2         2M     256M   16 Unified         2   2048        1             64
      L3       320M     640M   20 Unified         3 262144        1             64

/proc/cpuinfo cache data
   cache size : 327680 KB

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 2 nodes (0-1)
```

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## Platform Notes (Continued)

```
  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 43 44 45 46 47 48 49 50 51 52 53 54 55 56
  57 58 59 60 61 62 63 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143
  144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165
  166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187
  188 189 190 191
  node 0 size: 515702 MB
  node 0 free: 512744 MB
  node 1 cpus: 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 99 100 101 102 103 104 105 106 107 108 109 110 111 112
  113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 192 193 194 195 196 197 198
  199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220
  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
  node 1 size: 516000 MB
  node 1 free: 513762 MB
  node distances:
  node   0   1
    0:  10  21
    1:  21  10

From /proc/meminfo
   MemTotal:       1056463060 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/sbin/tuned-adm active
    Current active profile: throughput-performance

/usr/bin/lsb_release -d
   Ubuntu 22.04.3 LTS

From /etc/*release* /etc/*version*
   debian_version: bookworm/sid
   os-release:
      PRETTY_NAME="Ubuntu 22.04.3 LTS"
      NAME="Ubuntu"
      VERSION_ID="22.04"
      VERSION="22.04.3 LTS (Jammy Jellyfish)"
      VERSION_CODENAME=jammy
      ID=ubuntu
      ID_LIKE=debian
      HOME_URL="https://www.ubuntu.com/"

uname -a:
   Linux mingyuan-Super-Server 6.2.0-39-generic #40~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC
   Thu Nov 16 10:53:04 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
```

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## Platform Notes (Continued)

```
 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 IBRS, IBPB:
                                                        conditional, RSB filling,
                                                        PBRSB-eIBRS: SW sequence
 CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
 CVE-2019-11135 (TSX Asynchronous Abort):               Not affected

 run-level 3 Dec 21 15:43

 SPEC is set to: /home/accel
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/nvme0n1p2 ext4  879G  250G  585G  30% /

 From /sys/devices/virtual/dmi/id
     Vendor:         Supermicro
     Product:        Super Server
     Product Family: Family
     Serial:         0123456789

 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:
     16x NO DIMM NO DIMM
     15x Samsung M321R8GA0PB0-CWMKH 64 GB 2 rank 5600
     1x Samsung M321R8GA0PB0-CWMXH 64 GB 2 rank 5600

 BIOS:
    BIOS Vendor:       American Megatrends International, LLC.
    BIOS Version:      2.0
    BIOS Date:         10/07/2023
```

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## Platform Notes (Continued)

```
    BIOS Revision:     5.32

 (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 2024.0.0 (2024.0.0.20231017)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2024.0/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2024.0/bin/compiler/../icx.cfg
------------------------------------------------------------------------------

==============================================================================
Fortran    | 450.md(base) 455.seismic(base) 456.spF(base) 460.ilbdc(base)
           | 463.swim(base)
------------------------------------------------------------------------------
ifx (IFX) 2024.0.0 20231017
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran, C | 453.clvrleaf(base) 459.miniGhost(base)
------------------------------------------------------------------------------
ifx (IFX) 2024.0.0 20231017
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler 2024.0.0 (2024.0.0.20231017)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2024.0/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2024.0/bin/compiler/../icx.cfg
------------------------------------------------------------------------------
```

## Base Compiler Invocation

C benchmarks:
icx

Fortran benchmarks:
ifx

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## Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifx icx

## Base Portability Flags

450.md: -80
457.spC: -Wl,--no-relax(icx)(*) -mcmodel=medium -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:
-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

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

The flags files that were used to format this result can be browsed at
http://www.spec.org/accel2023/flags/Supermicro-Platform-Settings-V1.2-SPR-revG.html
http://www.spec.org/accel2023/flags/Intel_compiler_flags.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/accel2023/flags/Supermicro-Platform-Settings-V1.2-SPR-revG.xml
http://www.spec.org/accel2023/flags/Intel_compiler_flags.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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