SPECaccel®2023 Result

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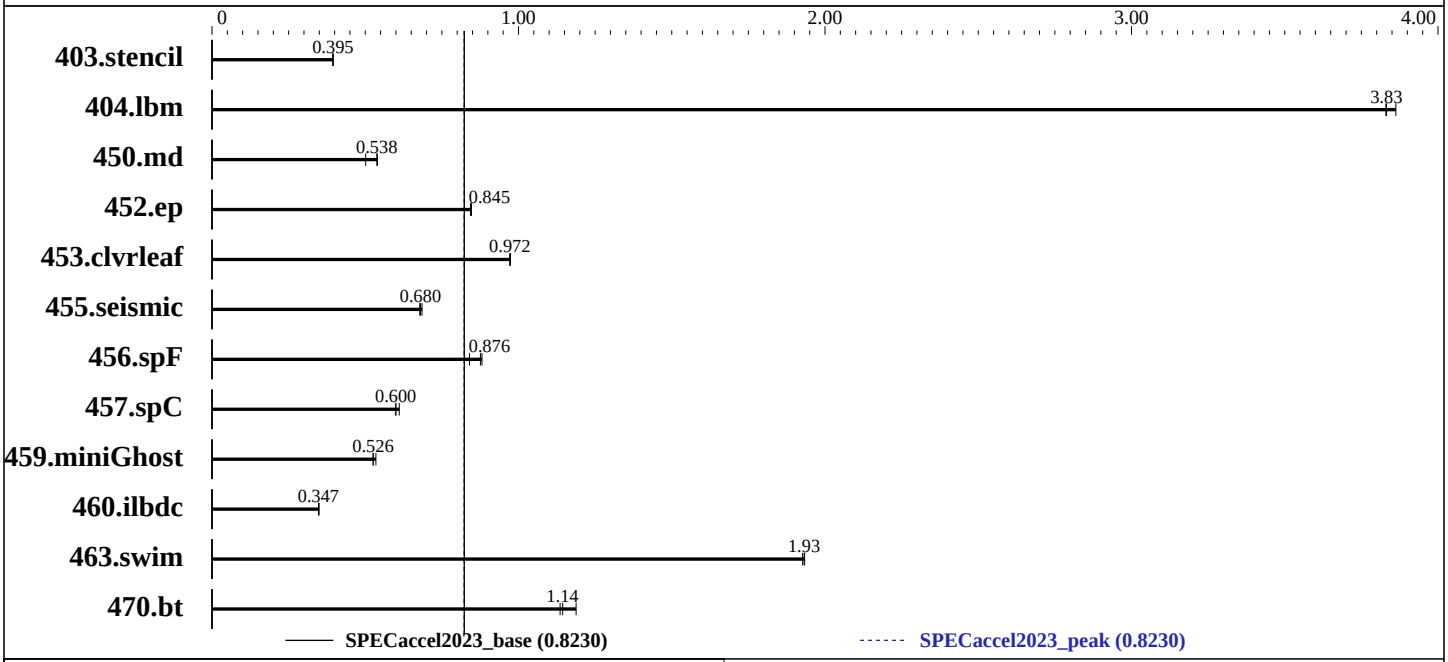
Supermicro
Intel Xeon Platinum 8592+
UP SuperServer SYS-521C-NR

SPECaccel 2023_base = 0.8230

SPECaccel 2023_peak = 0.8230

accel2023 License: 6569
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Feb-2024
Hardware Availability: Dec-2023
Software Availability: Nov-2023



Hardware

CPU Name:	INTEL Xeon Platinum 8592+
Max MHz.:	3900
Nominal:	1900
Enabled:	64 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:	320 MB I+D on chip per chip
Other:	None
Memory:	512 GB (8 x 64 GB 2Rx4 PC5-5600B-R)
Storage:	1 x 240 GB SATA III SSD
Other:	None
Base Threads Run:	128
Min. Peak Threads:	128
Max. Peak Threads:	128

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:	1 x Intel Xeon Platinum 8592+
Accel Driver:	N/A

Software

OS:	SUSE Linux Enterprise Server 15 SP5 Kernel 5.14.21-150500.53-default
Compiler:	C/C++/Fortran: Version 2024.0.0.20231017 of Intel oneAPI DPC++/C++
Firmware:	Version 2.1 released Dec-2023
File System:	xfs
System State:	Run level 3 (multi-user)
Other:	None
Base Parallel Model:	LOP
Base Threads Run:	128

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Software (Continued)

Peak Parallel Models: LOP
Max. Peak Threads: 128
Min. Peak Threads: 128

Results Table

Benchmark	Base							Peak						
	Model	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
403.stencil	LOP	1114	0.395	**1114**	**0.395**	1117	0.394	LOP	1114	0.395	**1114**	**0.395**	1117	0.394
404.lbm	LOP	119	3.83	**119**	**3.83**	118	3.86	LOP	119	3.83	**119**	**3.83**	118	3.86
450.md	LOP	1112	0.540	**1116**	**0.538**	1197	0.501	LOP	1112	0.540	**1116**	**0.538**	1197	0.501
452.ep	LOP	490	0.847	492	0.843	**491**	**0.845**	LOP	490	0.847	492	0.843	**491**	**0.845**
453.clvrleaf	LOP	**1029**	**0.972**	1027	0.974	1029	0.972	LOP	**1029**	**0.972**	1027	0.974	1029	0.972
455.seismic	LOP	1138	0.685	**1147**	**0.680**	1151	0.678	LOP	1138	0.685	**1147**	**0.680**	1151	0.678
456.spF	LOP	539	0.881	565	0.840	**542**	**0.876**	LOP	539	0.881	565	0.840	**542**	**0.876**
457.spC	LOP	884	0.611	901	0.600	**900**	**0.600**	LOP	884	0.611	901	0.600	**900**	**0.600**
459.miniGhost	LOP	**1122**	**0.526**	1122	0.526	1103	0.535	LOP	**1122**	**0.526**	1122	0.526	1103	0.535
460.ilbdc	LOP	**1597**	**0.347**	1588	0.349	1598	0.347	LOP	**1597**	**0.347**	1588	0.349	1598	0.347
463.swim	LOP	228	1.93	228	1.93	**228**	**1.93**	LOP	228	1.93	228	1.93	**228**	**1.93**
470.bt	LOP	929	1.14	**922**	**1.14**	888	1.19	LOP	929	1.14	**922**	**1.14**	888	1.19

SPEC accel2023_base = 0.8230

SPEC accel2023_peak = 0.8230

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

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

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 = "1S,64C,2T"
KMP_LIBRARY = "turnaround"
OMP_DYNAMIC = "FALSE"
OMP_NUM_THREADS = "64"
OMP_WAIT_POLICY = "active"

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, 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.
```

Platform Notes

```
Sysinfo program /home/accel2023/bin/sysinfo
Rev: r6622 of 2021-04-07 b1a7d5f8f71be5aff70a755cad7211a0
running on 135-175-25 Fri Feb  9 10:18:36 2024

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+
      1  "physical id"s (chips)
      128 "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

From lscpu from util-linux 2.37.4:
     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):                          128
     On-line CPU(s) list:             0-127
     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):                       1
     Stepping:                        2
     Frequency boost:                 enabled
     CPU max MHz:                     1901.0000
     CPU min MHz:                     800.0000
     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
      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 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 avx512_fp16 amx_tile flush_l1d arch_capabilities
      Virtualization:                  VT-x
      L1d cache:                       3 MiB (64 instances)
      L1i cache:                       2 MiB (64 instances)
      L2 cache:                        128 MiB (64 instances)
      L3 cache:                        320 MiB (1 instance)
      NUMA node(s):                    2
      NUMA node0 CPU(s):               0-31,64-95
      NUMA node1 CPU(s):               32-63,96-127
      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       3M   12 Data            1     64        1             64
       L1i       32K       2M    8 Instruction     1     64        1             64
       L2         2M     128M   16 Unified         2   2048        1             64
       L3       320M     320M   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)
    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 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
```

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Platform Notes (Continued)

```
  node 0 size: 257638 MB
  node 0 free: 255603 MB
  node 1 cpus: 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 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
  node 1 size: 257993 MB
  node 1 free: 257320 MB
  node distances:
  node   0   1
    0:  10  12
    1:  12  10

From /proc/meminfo
   MemTotal:       528006388 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
   performance

From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP5"
      VERSION_ID="15.5"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP5"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp5"

uname -a:
   Linux 135-175-25 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

Kernel self-reported vulnerability status:

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
CVE-2018-3639 (Speculative Store Bypass):          Mitigation: Speculative Store
                                                   Bypass disabled via prctl and
                                                   seccomp
CVE-2017-5753 (Spectre variant 1):                 Mitigation: usercopy/swapgs
```

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Platform Notes (Continued)

```
                                                      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 Feb 8 16:39

 SPEC is set to: /home/accel2023
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda2      xfs   221G   38G  184G  18% /

 From /sys/devices/virtual/dmi/id
     Vendor:         Supermicro
     Product:        SYS-521C-NR
     Product Family: Family
     Serial:         1234567890

 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:
     8x Micron Technology MTC40F2046S1RC56BD1 64 GB 2 rank 5600

 BIOS:
    BIOS Vendor:       American Megatrends International, LLC.
    BIOS Version:      2.1
    BIOS Date:         12/06/2023
    BIOS Revision:     5.32

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C          | 403.stencil(base, peak) 404.lbm(base, peak) 452.ep(base, peak)
           | 457.spC(base, peak) 470.bt(base, peak)
------------------------------------------------------------------------------
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
```

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Compiler Version Notes (Continued)

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

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

==============================================================================
Fortran, C | 453.clvrleaf(base, peak) 459.miniGhost(base, peak)
------------------------------------------------------------------------------
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

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 -xsapphirerapids -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 -xsapphirerapids -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 -xsapphirerapids -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

Peak Compiler Invocation

C benchmarks:
icx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Peak 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.

Peak Optimization Flags

C benchmarks:

403.stencil: `basepeak = yes`

404.lbm: `basepeak = yes`

452.ep: `basepeak = yes`

457.spC: `basepeak = yes`

470.bt: `basepeak = yes`

Fortran benchmarks:

450.md: `basepeak = yes`

455.seismic: `basepeak = yes`

456.spF: `basepeak = yes`

460.ilbdc: `basepeak = yes`

463.swim: `basepeak = yes`

Benchmarks using both Fortran and C:

453.clvrleaf: `basepeak = yes`

459.miniGhost: `basepeak = yes`

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.2024-03-06.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.2024-03-06.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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