SPECaccel®2023 Result

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Intel
Intel Xeon Platinum 8360Y

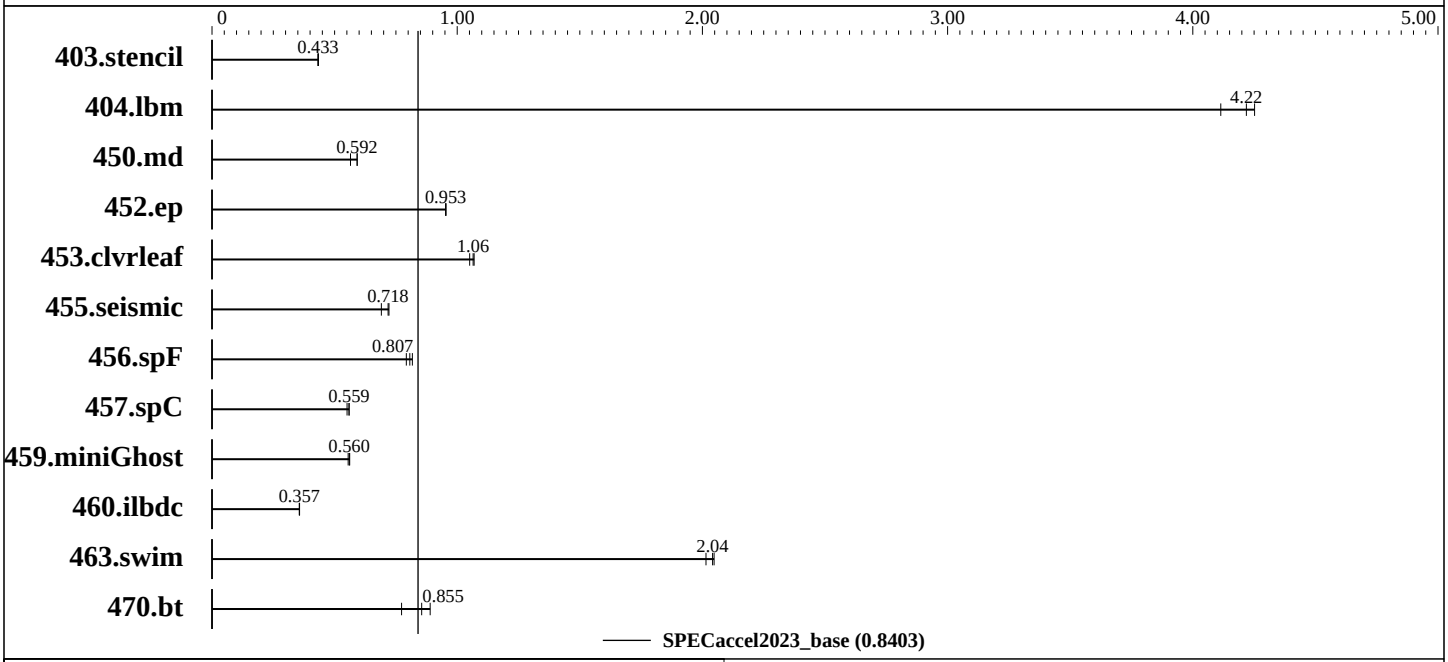
Intel Server M50CYP2SBSTD (2 x Intel Xeon Platinum 8360Y, 2.4GHz)

SPECaccel 2023_base = 0.8403

SPECaccel 2023_peak = Not Run

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

Test Date: Dec-2023
Hardware Availability: Apr-2021
Software Availability: Nov-2023



Hardware

CPU Name:	Intel Xeon Platinum 8360Y
Max MHz.:	3500
Nominal:	2400
Enabled:	72 cores, 2 chips, 2 threads/core
Orderable:	1, 2 chips
Cache L1:	32 KB I + 48 KB D on chip per core
L2:	1280 KB I+D on chip per core
L3:	54 MB I+D on chip per chip
Other:	None
Memory:	256 GB (16 x 16 GB 2Rx8 DDR4-3200Y-R ECC Registered)
Storage:	269 TB
Other:	None
Base Threads Run:	144
Min. Peak Threads:	--
Max. Peak Threads:	--

Accelerator

Accel Model Name:	Intel Xeon Platinum 8360Y
Accel Vendor:	Intel
Accel Name:	Intel Xeon Platinum 8360Y
Type of Accel:	CPU
Accel Connection:	N/A
Does Accel Use ECC:	yes
Accel Description:	Intel Xeon Platinum 8360Y SMT ON, Turbo ON
Accel Driver:	N/A

Software

OS:	Rocky Linux 8.8 (Green Obsidian) SUSE Linux Enterprise Server 15 SP4 5.14.21-150400.24.100-default
Compiler:	Intel oneAPI Compiler 2024.0.2
Firmware:	SE5C620.86B.01.01.0003.2104260124
File System:	panfs
System State:	Run level 5
Other:	None
Base Parallel Model:	SMD

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Software (Continued)

Base Threads Run: 144
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	**1016**	**0.433**	1014	0.434	1018	0.432							
404.lbm	SMD	**108**	**4.22**	111	4.11	107	4.25							
450.md	SMD	1062	0.565	1014	0.592	**1014**	**0.592**							
452.ep	SMD	**435**	**0.953**	435	0.954	435	0.953							
453.clvrleaf	SMD	**939**	**1.06**	935	1.07	952	1.05							
455.seismic	SMD	**1086**	**0.718**	1081	0.722	1129	0.691							
456.spF	SMD	599	0.792	**589**	**0.807**	581	0.817							
457.spC	SMD	966	0.559	**966**	**0.559**	980	0.551							
459.miniGhost	SMD	1063	0.555	1051	0.562	**1054**	**0.560**							
460.ilbdc	SMD	1554	0.357	**1556**	**0.357**	1559	0.356							
463.swim	SMD	215	2.05	**216**	**2.04**	218	2.01							
470.bt	SMD	1365	0.773	1186	0.890	**1234**	**0.855**							

SPEC accel2023_base = 0.8403

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,36C,2T"
KMP_LIBRARY = "turnaround"
KMP_STACKSIZE = "8M"
OMP_DYNAMIC = "FALSE"
OMP_WAIT_POLICY = "active"

The PANASAS filesystem as described on this result page was formerly
generally available.  At the time of this publication, it may
not be shipping, and/or may not be supported, and/or may fail
to meet other tests of General Availability described in the
SPEC HPG Policy document, http://www.spec.org/hpg/policy.html
```

Platform Notes

```
Sysinfo program /global/panfs02/innl/abobyr/SpecACCEL_OMP/kits/accel2023_emr/bin/sysinfo
Rev: r6622 of 2021-04-07 b1a7d5f8f71be5aff70a755cad7211a0
running on eix150 Sat Dec 30 17:17:38 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 8360Y CPU @ 2.40GHz
      2  "physical id"s (chips)
      144 "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 : 36
      siblings  : 72
      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
      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

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):                          144
     On-line CPU(s) list:             0-143
     Vendor ID:                       GenuineIntel
     Model name:                      Intel(R) Xeon(R) Platinum 8360Y CPU @ 2.40GHz
     CPU family:                      6
     Model:                           106
     Thread(s) per core:              2
     Core(s) per socket:              36
     Socket(s):                       2
     Stepping:                        6
     Frequency boost:                 enabled
     CPU max MHz:                     2401.0000
     CPU min MHz:                     800.0000
     BogoMIPS:                        4800.00
     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 pni pclmulqdq dtes64 monitor ds_cpl 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
```

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Platform Notes (Continued)

```
      epb cat_l3 invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust
      bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx
      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 wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp
      hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
      avx512_bitalg tme avx512_vpopcntdq la57 rdpid fsrm md_clear pconfig flush_l1d
      arch_capabilities
      L1d cache:                            3.4 MiB (72 instances)
      L1i cache:                            2.3 MiB (72 instances)
      L2 cache:                             90 MiB (72 instances)
      L3 cache:                             108 MiB (2 instances)
      NUMA node(s):                         2
      NUMA node0 CPU(s):                    0-35,72-107
      NUMA node1 CPU(s):                    36-71,108-143
      Vulnerability Gather data sampling: Vulnerable: No microcode
      Vulnerability Itlb multihit:          Not affected
      Vulnerability L1tf:                   Not affected
      Vulnerability Mds:                    Not affected
      Vulnerability Meltdown:               Not affected
      Vulnerability Mmio stale data:        Vulnerable: Clear CPU buffers attempted, no
      microcode; SMT vulnerable
      Vulnerability Retbleed:               Not affected
      Vulnerability Spec rstack overflow: 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 / Automatic 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     3.4M   12 Data            1    64        1             64
      L1i       32K     2.3M    8 Instruction     1    64        1             64
      L2       1.3M      90M   20 Unified         2  1024        1             64
      L3        54M     108M   12 Unified         3 73728        1             64

  /proc/cpuinfo cache data
     cache size : 55296 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
```

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Platform Notes (Continued)

```
  28 29 30 31 32 33 34 35 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
  node 0 size: 128586 MB
  node 0 free: 116242 MB
  node 1 cpus: 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 64 65 66 67 68 69 70 71 108 109 110 111 112 113 114 115 116 117 118 119 120
  121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142
  143
  node 1 size: 128958 MB
  node 1 free: 127700 MB
  node distances:
  node   0   1
    0:  10  20
    1:  20  10

From /proc/meminfo
   MemTotal:       263726088 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

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

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 15 SP4

From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP4"
      VERSION_ID="15.4"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp4"

uname -a:
   Linux eix150 5.14.21-150400.24.100-default #1 SMP PREEMPT_DYNAMIC Mon Dec 4 19:12:13
   UTC 2023 (3f5cd84) x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

gather_data_sampling:                                Vulnerable: No microcode
CVE-2018-12207 (iTLB Multihit):                      Not affected
CVE-2018-3620 (L1 Terminal Fault):                   Not affected
Microarchitectural Data Sampling:                    Not affected
```

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Platform Notes (Continued)

```
 CVE-2017-5754 (Meltdown):                                    Not affected
 mmio_stale_data:                                             Vulnerable: Clear CPU buffers
                                                              attempted, no microcode; SMT
                                                              vulnerable
 retbleed:                                                    Not affected
 spec_rstack_overflow:                                        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
                                                              barriers and __user pointer
                                                              sanitization
 CVE-2017-5715 (Spectre variant 2):                           Mitigation: Enhanced / Automatic
                                                               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 5 Dec 22 00:17

 SPEC is set to: /global/panfs02/innl/abobyr/SpecACCEL_OMP/kits/accel2023_emr
    Filesystem                Type   Size  Used Avail Use% Mounted on
    panfs://36.101.212.1/innl panfs  269T  245T   25T  92% /global/panfs02/innl

 From /sys/devices/virtual/dmi/id
     Vendor:         Intel Corporation
     Product:        WHITLEY
     Product Family: Family

 Cannot run dmidecode; consider saying (as root)
    chmod +s /usr/sbin/dmidecode

 BIOS:
    BIOS Vendor:       Intel Corporation
    BIOS Version:      SE5C620.86B.01.01.0003.2104260124
    BIOS Date:         04/26/2021

 (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 2024.0.2 (2024.0.2.20231213)
```

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Compiler Version Notes (Continued)

```
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /home/abobyr/intel/oneapi/compiler/2024.0/bin/compiler
Configuration file:
  /home/abobyr/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) 2024.0.2 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran, C | 453.clvrleaf(base) 459.miniGhost(base)
------------------------------------------------------------------------------
ifx (IFX) 2024.0.2 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler 2024.0.2 (2024.0.2.20231213)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /home/abobyr/intel/oneapi/compiler/2024.0/bin/compiler
Configuration file:
  /home/abobyr/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)(*) -shared-intel -Wl,--no-relax(icx)

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Base Portability Flags (Continued)

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 -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`

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
(*) 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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