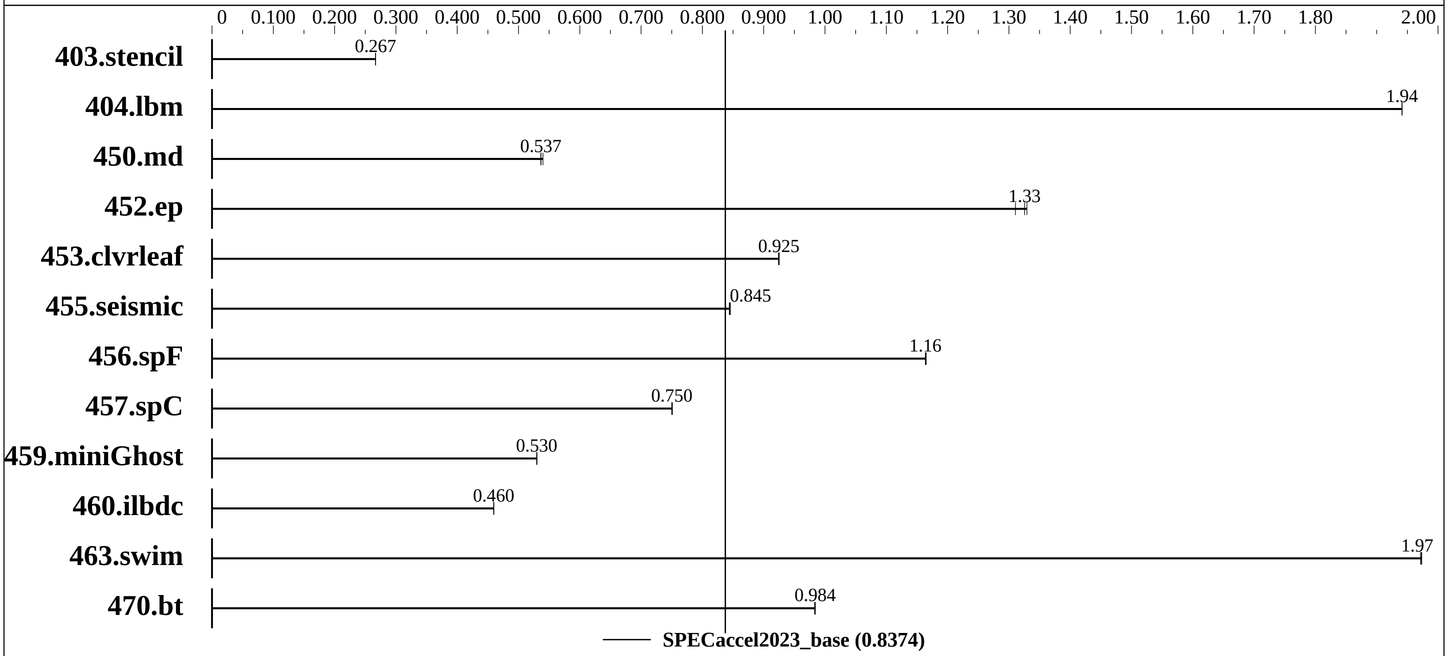
SPECaccel®2023 Result

Cisco Systems
AMD EPYC 9754
Cisco UCS C245 M8

SPECaccel 2023_base = 0.8374

SPECaccel 2023_peak = Not Run

accel2023 License:	9019	**Test Date:**	May-2024
Test Sponsor:	Cisco Systems	**Hardware Availability:**	Jun-2024
Tested by:	Cisco Systems	**Software Availability:**	Feb-2024



Hardware

CPU Name:	AMD EPYC 9754
Max MHz.:	3100
Nominal:	2250
Enabled:	128 cores, 1 chip, 2 threads/core
Orderable:	1 chip
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	256 MB I+D on chip per chip, 16 MB shared / 8 cores
Other:	None
Memory:	768 GB (12 x 64 GB 2Rx4 PC5-5600B-R, running at 4800 MHz)
Storage:	1 x 240 GB M.2 SSD
Other:	None
Base Threads Run:	256
Min. Peak Threads:	--
Max. Peak Threads:	--

Accelerator

Accel Model Name:	AMD EPYC 9754
Accel Vendor:	AMD
Accel Name:	AMD EPYC 9754
Type of Accel:	CPU
Accel Connection:	N/A
Does Accel Use ECC:	Yes
Accel Description:	1 x AMD EPYC 9754
Accel Driver:	N/A

Software

OS:	SUSE Linux Enterprise Server 15 SP5 5.14.21-150500.53-default
Compiler:	Intel oneAPI DPC++/C++ Compiler, Version 2024.0.2
Firmware:	Version C245M8.4.3.4.255.0410240854 released Apr-2024
File System:	xfs
System State:	Run level 3 (multi-user)

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Software (Continued)

Other: None
Base Parallel Model: LOP
Base Threads Run: 256
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	1649	0.267	**1648**	**0.267**	1648	0.267							
404.lbm	LOP	234	1.94	**234**	**1.94**	234	1.94							
450.md	LOP	**1118**	**0.537**	1111	0.540	1119	0.536							
452.ep	LOP	**313**	**1.33**	312	1.33	317	1.31							
453.clvrleaf	LOP	1081	0.925	1082	0.924	**1081**	**0.925**							
455.seismic	LOP	922	0.846	924	0.844	**923**	**0.845**							
456.spF	LOP	408	1.16	408	1.17	**408**	**1.16**							
457.spC	LOP	719	0.751	720	0.750	**720**	**0.750**							
459.miniGhost	LOP	**1114**	**0.530**	1114	0.530	1113	0.530							
460.ilbdc	LOP	1208	0.459	1207	0.460	**1208**	**0.460**							
463.swim	LOP	223	1.97	**223**	**1.97**	223	1.97							
470.bt	LOP	**1072**	**0.984**	1073	0.983	1072	0.984							

SPEC accel2023_base = 0.8374

SPEC accel2023_peak = Not Run

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,granularity=thread"
KMP_BLOCKTIME = "infinite"
KMP_HW_SUBSET = "1S,128C,2T"
KMP_LIBRARY = "turnaround"
KMP_STACKSIZE = "128M"
OMP_DYNAMIC = "FALSE"
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)
```

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General Notes (Continued)

```
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/specaccel/bin/sysinfo
 Rev: r6622 of 2021-04-07 b1a7d5f8f71be5aff70a755cad7211a0
 running on localhost Mon May 13 01:37:05 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 : AMD EPYC 9754 128-Core Processor
       1  "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 : 128
       siblings  : 256
       physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 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 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

 From lscpu from util-linux 2.37.4:
      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):                          256
      On-line CPU(s) list:             0-255
      Vendor ID:                       AuthenticAMD
      Model name:                      AMD EPYC 9754 128-Core Processor
      CPU family:                      25
      Model:                           160
      Thread(s) per core:              2
      Core(s) per socket:              128
      Socket(s):                       1
      Stepping:                        2
      Frequency boost:                 enabled
      CPU max MHz:                     3100.3411
```

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Platform Notes (Continued)

```
     CPU min MHz:                      1500.0000
     BogoMIPS:                         4493.21
     Flags:                            fpu vme de pse tsc msr pae mce cx8 apic sep mtrr
     pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt
     pdpe1gb rdtscp lm constant_tsc rep_good amd_lbr_v2 nopl nonstop_tsc cpuid
     extd_apicid aperfmperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2
     x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic
     cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
     perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single
     hw_pstate ssbd mba perfmon_v2 ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2
     erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb
     avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc
     cqm_occup_llc cqm_mbm_total cqm_mbm_local avx512_bf16 clzero irperf xsaveerptr rdpru
     wbnoinvd amd_ppin cppc arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean
     flushbyasid decodeassists pausefilter pfthreshold avic v_vmsave_vmload vgif
     v_spec_ctrl avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
     avx512_bitalg avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
     Virtualization:                   AMD-V
     L1d cache:                        4 MiB (128 instances)
     L1i cache:                        4 MiB (128 instances)
     L2 cache:                         128 MiB (128 instances)
     L3 cache:                         256 MiB (16 instances)
     NUMA node(s):                     1
     NUMA node0 CPU(s):                0-255
     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; Retpolines, IBPB conditional, IBRS_FW,
     STIBP always-on, 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       32K       4M    8 Data            1    64        1             64
     L1i       32K       4M    8 Instruction     1    64        1             64
     L2         1M     128M    8 Unified         2  2048        1             64
     L3        16M     256M   16 Unified         3 16384        1             64

 /proc/cpuinfo cache data
```

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Platform Notes (Continued)

```
   cache size : 1024 KB

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 1 nodes (0)
  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 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
  111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132
  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
  177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198
  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 0 size: 773242 MB
  node 0 free: 771830 MB
  node distances:
  node   0
    0:  10

From /proc/meminfo
   MemTotal:       791800784 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 localhost 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:
```

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Platform Notes (Continued)

```
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
                                                        barriers and __user pointer
                                                        sanitization
CVE-2017-5715 (Spectre variant 2):                      Mitigation: Retpolines, IBPB:
                                                        conditional, IBRS_FW, STIBP:
                                                        always-on, RSB filling,
                                                        PBRSB-eIBRS: Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort):                Not affected

run-level 3 May 13 01:31

SPEC is set to: /home/specaccel
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sdb2      xfs   223G  174G   50G  78% /

From /sys/devices/virtual/dmi/id
    Vendor:         Cisco Systems Inc
    Product:        UCSC-C245-M8SX
    Serial:         WZP27520MSW

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:
    12x 0xCE00 M321R8GA0PB0-CWMCH 64 GB 2 rank 5600, configured at 4800

BIOS:
   BIOS Vendor:       Cisco Systems, Inc.
   BIOS Version:      C245M8.4.3.4.255.0410240854
   BIOS Date:         04/10/2024
   BIOS Revision:     5.27

(End of data from sysinfo program)
```

Cisco Systems
AMD EPYC 9754
Cisco UCS C245 M8

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SPECaccel2023_peak = Not Run

accel2023 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems
Test Date: May-2024
Hardware Availability: Jun-2024
Software Availability: Feb-2024

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)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /home/intel_tools/compiler/compiler/2024.0/bin/compiler
Configuration file:
  /home/intel_tools/compiler/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/intel_tools/compiler/compiler/2024.0/bin/compiler
Configuration file:
  /home/intel_tools/compiler/compiler/2024.0/bin/compiler/../icx.cfg
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icx`

Fortran benchmarks:
`ifx`

Benchmarks using both Fortran and C:
`ifx icx`

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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:
```
-qopenmp -Ofast -O3 -march=common-avx512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -flto -ffast-math
-qopt-dynamic-align -fvec-peel-loops -qopt-streaming-stores always
-Xclang -fopenmp-declare-target-scalar-defaultmap-firstprivate
-fimf-precision=low
```

Fortran benchmarks:
```
-qopenmp -Ofast -O3 -march=common-avx512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -flto -ffast-math
-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:
```
-qopenmp -Ofast -O3 -march=common-avx512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -flto -ffast-math
-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 file that was used to format this result can be browsed at
http://www.spec.org/accel2023/flags/Intel_compiler_flags_accel.2024.2024-05-29.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/accel2023/flags/Intel_compiler_flags_accel.2024.2024-05-29.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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