SPECaccel®2023 Result

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Supermicro
Intel Xeon 6787P

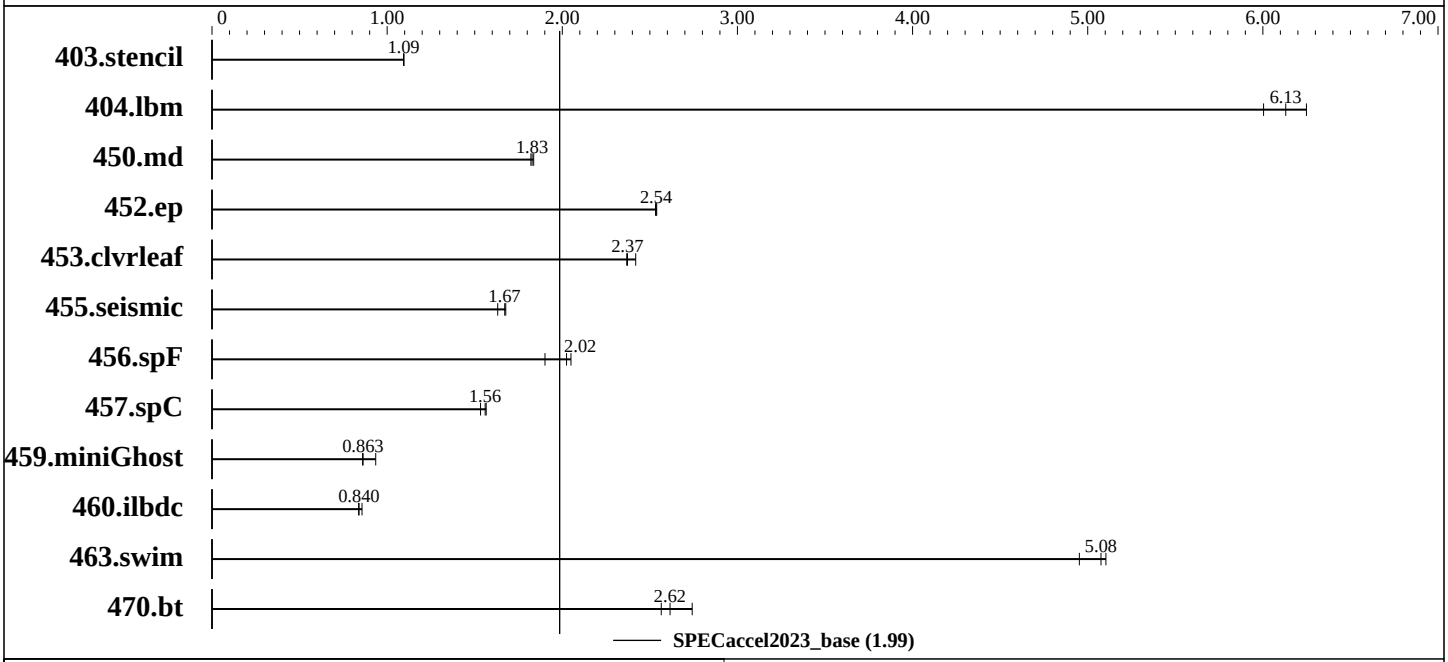
SuperServer SYS-222H-TN (2 x Intel Xeon 6787P, 2.0GHz, MCR)

SPECaccel 2023_base = 1.99

SPECaccel 2023_peak = Not Run

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

Test Date: Feb-2025
Hardware Availability: Feb-2025
Software Availability: Oct-2024



Hardware

CPU Name:	Intel Xeon 6787P
Max MHz.:	3800
Nominal:	2000
Enabled:	172 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:	336 MB I+D on chip per chip
Other:	None
Memory:	1024 GB (16x64GB DDR5 MRDIMM 8800 MT/s)
Storage:	1 x 1.6TB NVMe SSD
Other:	None
Base Threads Run:	344
Min. Peak Threads:	--
Max. Peak Threads:	--

Accelerator

Accel Model Name:	Intel Xeon 6787P
Accel Vendor:	Intel
Accel Name:	Intel Xeon 6787P
Type of Accel:	CPU
Accel Connection:	N/A
Does Accel Use ECC:	yes
Accel Description:	Intel Xeon 6787P SMT ON, Turbo ON
Accel Driver:	None

Software

OS:	SUSE Linux Enterprise Server 15 SP6 6.4.0-150600.21-default
Compiler:	Intel oneAPI Compiler 2025.0.0
Firmware:	Version 1.2 released Jan-2025
File System:	btrfs
System State:	Run level 3 (multi-user)
Other:	None
Base Parallel Model:	SMD
Base Threads Run:	344
Peak Parallel Models:	Not Run

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Software (Continued)

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	402	1.09	402	1.09	**402**	**1.09**							
404.lbm	SMD	75.8	6.00	**74.2**	**6.13**	72.8	6.25							
450.md	SMD	**328**	**1.83**	327	1.84	330	1.82							
452.ep	SMD	**164**	**2.54**	164	2.53	163	2.54							
453.clvrleaf	SMD	422	2.37	**422**	**2.37**	413	2.42							
455.seismic	SMD	465	1.68	478	1.63	**467**	**1.67**							
456.spF	SMD	**235**	**2.02**	250	1.90	232	2.05							
457.spC	SMD	352	1.53	**346**	**1.56**	345	1.57							
459.miniGhost	SMD	**684**	**0.863**	686	0.860	631	0.935							
460.ilbdc	SMD	**661**	**0.840**	663	0.837	648	0.857							
463.swim	SMD	88.8	4.95	86.2	5.10	**86.7**	**5.08**							
470.bt	SMD	411	2.57	**403**	**2.62**	385	2.74							

SPEC accel2023_base = 1.99

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,86C,2T"
KMP_LIBRARY = "turnaround"
KMP_STACKSIZE = "8M"
OMP_DYNAMIC = "FALSE"
OMP_WAIT_POLICY = "active"

BIOS Setting:
    Power Performance Tuning = BIOS Controls EPB
    ENERGY_PERF_BIAS_CFG Mode = Extreme Performance
OS tunning:
    Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
 Sysinfo program /home/accel2023/bin/sysinfo
```

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Platform Notes (Continued)

```
Rev: r6622 of 2021-04-07 b1a7d5f8f71be5aff70a755cad7211a0
running on 166-191 Tue Feb  4 02:17:41 2025

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) 6787P
      2  "physical id"s (chips)
      344 "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 : 86
      siblings  : 172
      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
      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

From lscpu from util-linux 2.39.3:
     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):                               344
     On-line CPU(s) list:                  0-343
     Vendor ID:                            GenuineIntel
     BIOS Vendor ID:                       Intel(R) Corporation
     Model name:                           Intel(R) Xeon(R) 6787P
     BIOS Model name:                      Intel(R) Xeon(R) 6787P  CPU @ 2.0GHz
     BIOS CPU family:                      179
     CPU family:                           6
     Model:                                173
     Thread(s) per core:                   2
     Core(s) per socket:                   86
     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
```

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Platform Notes (Continued)

```
      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 intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
      tpr_shadow 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 split_lock_detect user_shstk
      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:                           8.1 MiB (172 instances)
      L1i cache:                           10.8 MiB (172 instances)
      L2 cache:                            344 MiB (172 instances)
      L3 cache:                            672 MiB (2 instances)
      NUMA node(s):                        4
      NUMA node0 CPU(s):                   0-42,172-214
      NUMA node1 CPU(s):                   43-85,215-257
      NUMA node2 CPU(s):                   86-128,258-300
      NUMA node3 CPU(s):                   129-171,301-343
      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 Reg file data sampling: 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; BHI BHI_DIS_S
      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     8.1M   12 Data            1     64        1             64
      L1i       64K    10.8M   16 Instruction     1     64        1             64
      L2         2M     344M   16 Unified         2   2048        1             64
      L3       336M     672M   16 Unified         3 344064        1             64
```

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Platform Notes (Continued)

```
 /proc/cpuinfo cache data
    cache size : 344064 KB

 From numactl --hardware
 WARNING: a numactl 'node' might or might not correspond to a physical chip.
   available: 4 nodes (0-3)
   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 42 172 173 174 175 176 177 178 179 180 181
   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
   node 0 size: 257468 MB
   node 0 free: 256316 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 85 215 216 217 218 219 220 221 222
   223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244
   245 246 247 248 249 250 251 252 253 254 255 256 257
   node 1 size: 258025 MB
   node 1 free: 257261 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
   108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 258
   259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280
   281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
   node 2 size: 257986 MB
   node 2 free: 257120 MB
   node 3 cpus: 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
   169 170 171 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319
   320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341
   342 343
   node 3 size: 257578 MB
   node 3 free: 256693 MB
   node distances:
   node   0   1   2   3
     0:  10  12  21  21
     1:  12  10  21  21
     2:  21  21  10  12
     3:  21  21  12  10

 From /proc/meminfo
    MemTotal:       1055804660 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 From /etc/*release* /etc/*version*
    os-release:
       NAME="SLES"
       VERSION="15-SP6"
```

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Platform Notes (Continued)

```
      VERSION_ID="15.6"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP6"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp6"

uname -a:
   Linux 166-191 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC
   2024 (36c1e09) 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
reg_file_data_sampling:                               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; BHI: BHI_DIS_S
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort):              Not affected

run-level 3 Feb 4 02:14 last=5

SPEC is set to: /home/accel2023
   Filesystem     Type   Size  Used Avail Use% Mounted on
   /dev/nvme0n1p2 btrfs  1.5T   24G  1.5T   2% /home

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

Additional information from dmidecode 3.4 follows.  WARNING: Use caution when you
```

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Platform Notes (Continued)

```
 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 Samsung M327R8GA0EB0-CLVXB 64 GB 2 rank 11200, configured at 8000

 BIOS:
    BIOS Vendor:       American Megatrends International, LLC.
    BIOS Version:      1.2
    BIOS Date:         01/24/2025
    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 2025.0.0 (2025.0.0.20241008)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2025.0/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2025.0/bin/compiler/../icx.cfg
------------------------------------------------------------------------------

==============================================================================
Fortran    | 450.md(base) 455.seismic(base) 456.spF(base) 460.ilbdc(base)
           | 463.swim(base)
------------------------------------------------------------------------------
ifx (IFX) 2025.0.0 20241008
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran, C | 453.clvrleaf(base) 459.miniGhost(base)
------------------------------------------------------------------------------
ifx (IFX) 2025.0.0 20241008
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler 2025.0.0 (2025.0.0.20241008)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/intel/oneapi/compiler/2025.0/bin/compiler
Configuration file: /opt/intel/oneapi/compiler/2025.0/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: -mcmodel=medium -Wl,--no-relax
459.miniGhost: -nofor-main

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
-fimf-precision=low -Xclang
-fopenmp-declare-target-scalar-defaultmap-firstprivate

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
-fimf-precision=low -nostandard-realloc-lhs -align array32byte -auto
-fimf-accuracy-bits-sqrt=14

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
-fimf-precision=low -Xclang
-fopenmp-declare-target-scalar-defaultmap-firstprivate
-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.2024-12-31.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.2024-12-31.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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