



SPECaccel[®]2023 Result

Copyright 2023-2024 Standard Performance Evaluation Corporation

Supermicro Intel Xeon 6960P

SuperServer SYS-122HA-TN-LCC (2 x Intel Xeon 6960P, 2.7GHz, MCR)

SPECaccel2023_base = 2.44

SPECaccel2023_peak = Not Run

accel2023 License: 001176

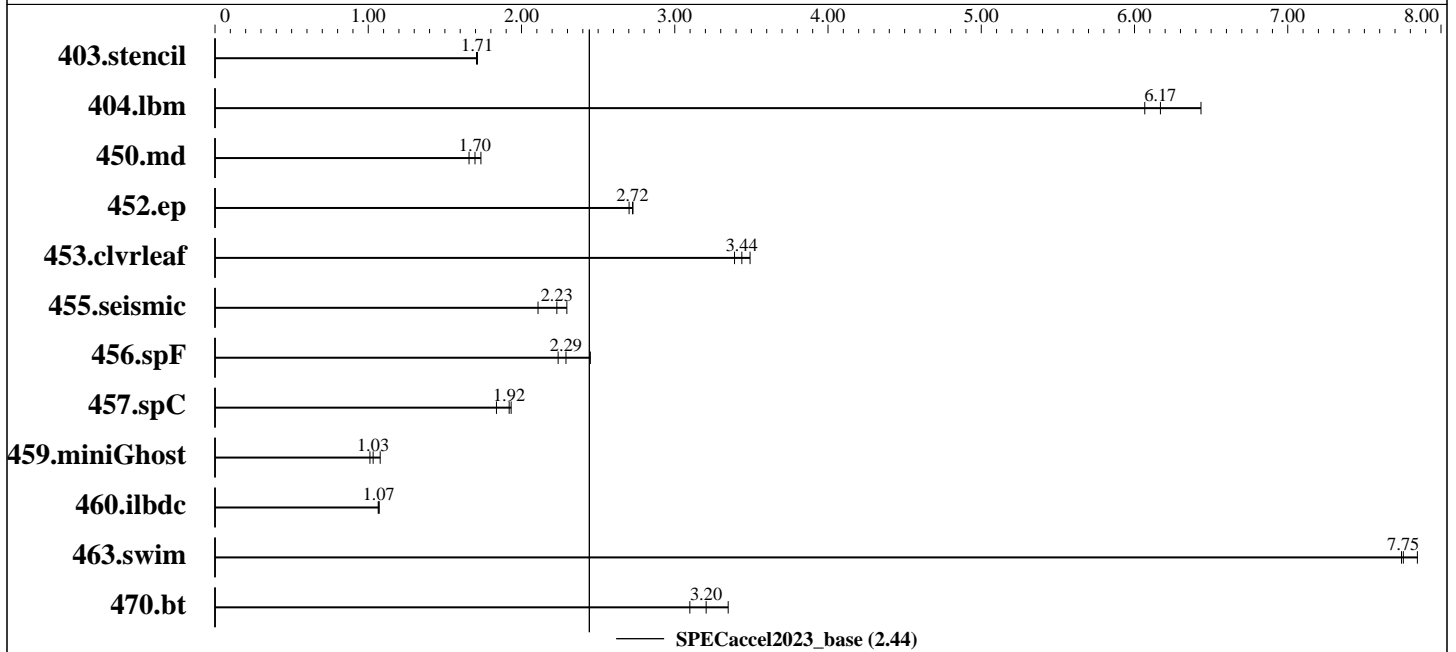
Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Dec-2024

Hardware Availability: Nov-2024

Software Availability: Oct-2024



Hardware

CPU Name: Intel Xeon 6960P
 Max MHz.: 3900
 Nominal: 2700
 Enabled: 144 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: 432 MB I+D on chip per chip
 Other: None
 Memory: 1536 GB (24x64GB DDR5 MRDIMM 8800 MT/s)
 Storage: 1 x 1.6TB NVMe SSD
 Other: None
 Base Threads Run: 288
 Min. Peak Threads: --
 Max. Peak Threads: --

Accelerator

Accel Model Name: Intel Xeon 6960P
 Accel Vendor: Intel
 Accel Name: Intel Xeon 6960P
 Type of Accel: CPU
 Accel Connection: N/A
 Does Accel Use ECC: yes
 Accel Description: Intel Xeon 6960P
 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 1.1 released Nov-2024
 File System: btrfs
 System State: Run level 3 (multi-user)
 Other: None
 Base Parallel Model: SMD
 Base Threads Run: 288
 Peak Parallel Models: Not Run

(Continued on next page)



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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	257	1.71	258	1.71	<u>257</u>	<u>1.71</u>							
404.lbm	SMD	70.7	6.43	<u>73.8</u>	<u>6.17</u>	75.0	6.07							
450.md	SMD	346	1.74	<u>354</u>	<u>1.70</u>	362	1.66							
452.ep	SMD	154	2.70	<u>152</u>	<u>2.72</u>	152	2.73							
453.clvrleaf	SMD	295	3.39	<u>291</u>	<u>3.44</u>	286	3.49							
455.seismic	SMD	340	2.30	370	2.11	<u>350</u>	<u>2.23</u>							
456.spF	SMD	212	2.24	194	2.45	<u>207</u>	<u>2.29</u>							
457.spC	SMD	279	1.93	<u>281</u>	<u>1.92</u>	294	1.84							
459.miniGhost	SMD	<u>572</u>	<u>1.03</u>	547	1.08	584	1.01							
460.ilbdc	SMD	<u>519</u>	<u>1.07</u>	518	1.07	521	1.06							
463.swim	SMD	<u>56.7</u>	<u>7.75</u>	56.1	7.85	56.8	7.74							
470.bt	SMD	340	3.10	315	3.35	<u>329</u>	<u>3.20</u>							

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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,72C,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 tuning:

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

Platform Notes

Sysinfo program /home/accel2023/bin/sysinfo

(Continued on next page)



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Platform Notes (Continued)

Rev: r6622 of 2021-04-07 b1a7d5f8f71be5aff70a755cad7211a0
running on 166-191 Sun Dec 8 16:39:45 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) 6960P
 2 "physical id"s (chips)
 288 "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 : 72
siblings : 144
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 64
65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 128 129 130
131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151
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 64
65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 128 129 130
131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151
```

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): 288
On-line CPU(s) list: 0-287
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation
Model name: Intel(R) Xeon(R) 6960P
BIOS Model name: Intel(R) Xeon(R) 6960P CPU @ 2.7GHz
BIOS CPU family: 179
CPU family: 6
Model: 173
Thread(s) per core: 2
Core(s) per socket: 72
Socket(s): 2
Stepping: 1
BogoMIPS: 5400.00
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
```

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Platform Notes (Continued)

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 hfi 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_llc arch_capabilities

Virtualization: VT-x

L1d cache: 6.8 MiB (144 instances)

L1i cache: 9 MiB (144 instances)

L2 cache: 288 MiB (144 instances)

L3 cache: 864 MiB (2 instances)

NUMA node(s): 6

NUMA node0 CPU(s): 0-23,144-167

NUMA node1 CPU(s): 24-47,168-191

NUMA node2 CPU(s): 48-71,192-215

NUMA node3 CPU(s): 72-95,216-239

NUMA node4 CPU(s): 96-119,240-263

NUMA node5 CPU(s): 120-143,264-287

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/swaps barriers and __user pointer sanitization

Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling; PBR SB-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	6.8M	12	Data	1	64	1	64
L1i	64K	9M	16	Instruction	1	64	1	64
L2	2M	288M	16	Unified	2	2048	1	64
L3	432M	864M	16	Unified	3	442368	1	64

(Continued on next page)



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Platform Notes (Continued)

```
/proc/cpuinfo cache data
cache size : 442368 KB
```

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.

available: 6 nodes (0-5)

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 23 144 145 146
147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167

node 0 size: 257480 MB

node 0 free: 256333 MB

node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
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 1 size: 258035 MB

node 1 free: 257478 MB

node 2 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213
214 215

node 2 size: 258035 MB

node 2 free: 257425 MB

node 3 cpus: 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237
238 239

node 3 size: 258035 MB

node 3 free: 257032 MB

node 4 cpus: 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114
115 116 117 118 119 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256
257 258 259 260 261 262 263

node 4 size: 257996 MB

node 4 free: 257450 MB

node 5 cpus: 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137
138 139 140 141 142 143 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279
280 281 282 283 284 285 286 287

node 5 size: 257588 MB

node 5 free: 256018 MB

node distances:

```
node  0  1  2  3  4  5
  0:  10  12  12  21  21  21
  1:  12  10  12  21  21  21
  2:  12  12  10  21  21  21
  3:  21  21  21  10  12  12
  4:  21  21  21  12  10  12
  5:  21  21  21  12  12  10
```

From /proc/meminfo

MemTotal: 1584303416 kB

HugePages_Total: 0

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Platform Notes (Continued)

Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*

```
os-release:
NAME="SLES"
VERSION="15-SP6"
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 (36cle09) 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; PBRSE-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 Dec 8 16:31 last=5

SPEC is set to: /home/accel2023

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p2 btrfs 1.5T 29G 1.5T 2% /home
```

From /sys/devices/virtual/dmi/id

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Platform Notes (Continued)

Vendor: Supermicro
Product: Super Server
Product Family: Family
Serial: 0123456789

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:

24x Micron Technology MTC40F2046S1HC88XD1 WCCC 64 GB 2 rank 8800

BIOS:

BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 1.1
BIOS Date: 11/06/2024
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.
```

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Compiler Version Notes (Continued)

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: -mcmmodel=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

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Base Optimization Flags (Continued)

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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