



SPECaccel[®]2023 Result

Copyright 2023-2024 Standard Performance Evaluation Corporation

Intel Intel Xeon Max 9480

Intel Server D50DNP1SBB (1 x Intel Xeon Max 9480, 1.9GHz, HBM-only mode)

SPECaccel2023_base = 1.27

SPECaccel2023_peak = Not Run

accel2023 License: 13

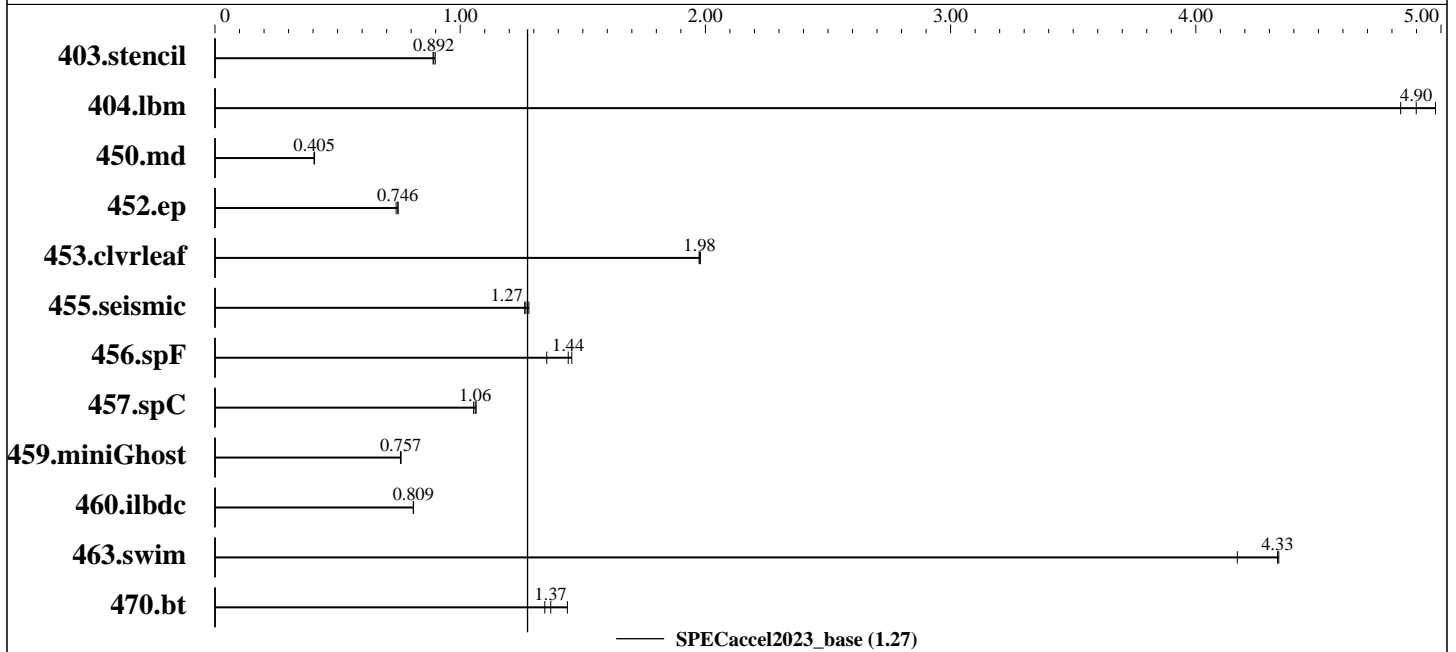
Test Sponsor: Intel

Tested by: Intel

Test Date: Dec-2023

Hardware Availability: Jan-2023

Software Availability: Nov-2023



Hardware

CPU Name: Intel Xeon Max 9480
 Max MHz.: 3500
 Nominal: 1900
 Enabled: 56 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: 115200 KB I+D on chip per chip
 Other: None
 Memory: 128 GB (8x16GB HBM2 3200 MT/s [3200 MT/s])
 Storage: 269 TB
 Other: None
 Base Threads Run: 112
 Min. Peak Threads: --
 Max. Peak Threads: --

Accelerator

Accel Model Name: Intel Xeon Max 9480
 Accel Vendor: Intel
 Accel Name: Intel Xeon Max 9480
 Type of Accel: CPU
 Accel Connection: N/A
 Does Accel Use ECC: yes
 Accel Description: Intel Xeon Max 9480
 SMT ON, Turbo ON
 Accel Driver: None

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: SE5C7411.86B.9525.D26.2305160804
 File System: panfs
 System State: Run level 5
 Other: None
 Base Parallel Model: SMD
 Base Threads Run: 112

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Software (Continued)

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	495	0.889	493	0.892	490	0.898									
404.lbm	SMD	91.4	4.98	94.1	4.84	92.9	4.90									
450.md	SMD	1484	0.404	1481	0.405	1478	0.406									
452.ep	SMD	556	0.747	557	0.746	562	0.739									
453.clvleaf	SMD	507	1.97	506	1.98	505	1.98									
455.seismic	SMD	609	1.28	618	1.26	615	1.27									
456.spF	SMD	330	1.44	326	1.46	351	1.35									
457.spC	SMD	507	1.07	509	1.06	512	1.05									
459.miniGhost	SMD	780	0.756	779	0.757	778	0.758									
460.ilbdc	SMD	686	0.809	685	0.810	686	0.809									
463.swim	SMD	102	4.33	101	4.34	106	4.17									
470.bt	SMD	771	1.37	784	1.34	734	1.44									

SPEC accel2023_base = 1.27

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 = "1S,56C,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>

HBM is configured as HBM-only mode.



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Tested by: Intel

Test Date: Dec-2023
Hardware Availability: Jan-2023
Software Availability: Nov-2023

Platform Notes

Sysinfo program /global/panfs02/innl/abobyrr/SpecACCEL_OMP/kits/accel2023/bin/sysinfo
Rev: r6622 of 2021-04-07 bla7d5f8f71be5aff70a755cad7211a0
running on eedh028 Wed Dec 27 05:38:11 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) CPU Max 9480
1 "physical id"s (chips)
112 "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 : 56
siblings : 112
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

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): 224
On-line CPU(s) list: 0-55,112-167
Off-line CPU(s) list: 56-111,168-223
Vendor ID: GenuineIntel
Model name: Intel (R) Xeon (R) CPU Max 9480
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 56
Socket(s): 1
Stepping: 8
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 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 invpcid_single intel_ppin cdp_l2 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 avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln
pts hwp hwp_act_window hwp_epp hwp_pkg_req 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_lld arch_capabilities
L1d cache:                2.6 MiB (56 instances)
L1i cache:                1.8 MiB (56 instances)
L2 cache:                 112 MiB (56 instances)
L3 cache:                 112.5 MiB (1 instance)
NUMA node(s):            8
NUMA node0 CPU(s):       0-13,112-125
NUMA node1 CPU(s):       14-27,126-139
NUMA node2 CPU(s):       28-41,140-153
NUMA node3 CPU(s):       42-55,154-167
NUMA node4 CPU(s):
NUMA node5 CPU(s):
NUMA node6 CPU(s):
NUMA node7 CPU(s):
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 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/swaps barriers and __user
pointer sanitization
Vulnerability Spectre v2:           Mitigation; Enhanced / Automatic IBRS, IBPB
conditional, RSB filling, PBR SB-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	2.6M	12	Data	1	64	1	64
L1i	32K	1.8M	8	Instruction	1	64	1	64
L2	2M	112M	16	Unified	2	2048	1	64
L3	112.5M	112.5M	15	Unified	3	122880	1	64

/proc/cpuinfo cache data

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Software Availability: Nov-2023

Platform Notes (Continued)

cache size : 115200 KB

From numactl --hardware

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

available: 8 nodes (0-7)

node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 112 113 114 115 116 117 118 119 120 121 122 123 124 125

node 0 size: 15838 MB

node 0 free: 4836 MB

node 1 cpus: 14 15 16 17 18 19 20 21 22 23 24 25 26 27 126 127 128 129 130 131 132 133 134 135 136 137 138 139

node 1 size: 16120 MB

node 1 free: 15153 MB

node 2 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 140 141 142 143 144 145 146 147 148 149 150 151 152 153

node 2 size: 16074 MB

node 2 free: 15635 MB

node 3 cpus: 42 43 44 45 46 47 48 49 50 51 52 53 54 55 154 155 156 157 158 159 160 161 162 163 164 165 166 167

node 3 size: 16120 MB

node 3 free: 15808 MB

node 4 cpus:

node 4 size: 16120 MB

node 4 free: 15874 MB

node 5 cpus:

node 5 size: 16120 MB

node 5 free: 15821 MB

node 6 cpus:

node 6 size: 16120 MB

node 6 free: 15934 MB

node 7 cpus:

node 7 size: 16072 MB

node 7 free: 15698 MB

node distances:

node	0	1	2	3	4	5	6	7
0:	10	14	14	14	23	23	23	23
1:	14	10	14	14	23	23	23	23
2:	14	14	10	14	23	23	23	23
3:	14	14	14	10	23	23	23	23
4:	23	23	23	23	10	14	14	14
5:	23	23	23	23	14	10	14	14
6:	23	23	23	23	14	14	10	14
7:	23	23	23	23	14	14	14	10

From /proc/meminfo

MemTotal: 131676532 kB

HugePages_Total: 0

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Platform Notes (Continued)

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 eedh028 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:	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
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, PBRSE-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 23 16:29

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Platform Notes (Continued)

```

SPEC is set to: /global/panfs02/innl/abobyr/SpecACCEL_OMP/kits/accel2023
Filesystem      Type      Size  Used Avail Use% Mounted on
panfs://36.101.212.1/innl panfs 269T 244T 25T 91% /global/panfs02/innl

```

```

From /sys/devices/virtual/dmi/id
Vendor:          Intel Corporation
Product:         D50DNP1SBB
Product Family: Family

```

```

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

```

```

BIOS:
  BIOS Vendor:    Intel Corporation
  BIOS Version:   SE5C7411.86B.9525.D26.2305160804
  BIOS Date:      05/16/2023

```

(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)
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.

```

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Compiler Version Notes (Continued)

Intel(R) oneAPI DPC++/C++ Compiler 2024.0.2 (2024.0.2.20231213)
 Target: x86_64-unknown-linux-gnu
 Thread model: posix
 InstalledDir: /home/aboby/r/intel/oneapi/compiler/2024.0/bin/compiler
 Configuration file:
 /home/aboby/r/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)
 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

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Base Optimization Flags (Continued)

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 -mcmmodel=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
```

(*) 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.

Tested with SPECaccel2023 v2.0.17 on 2023-12-27 07:38:10-0500.
 Report generated on 2024-02-14 12:22:31 by accel2023 PDF formatter v112.
 Originally published on 2024-02-14.