SPEC ACCEL™ OMP Result

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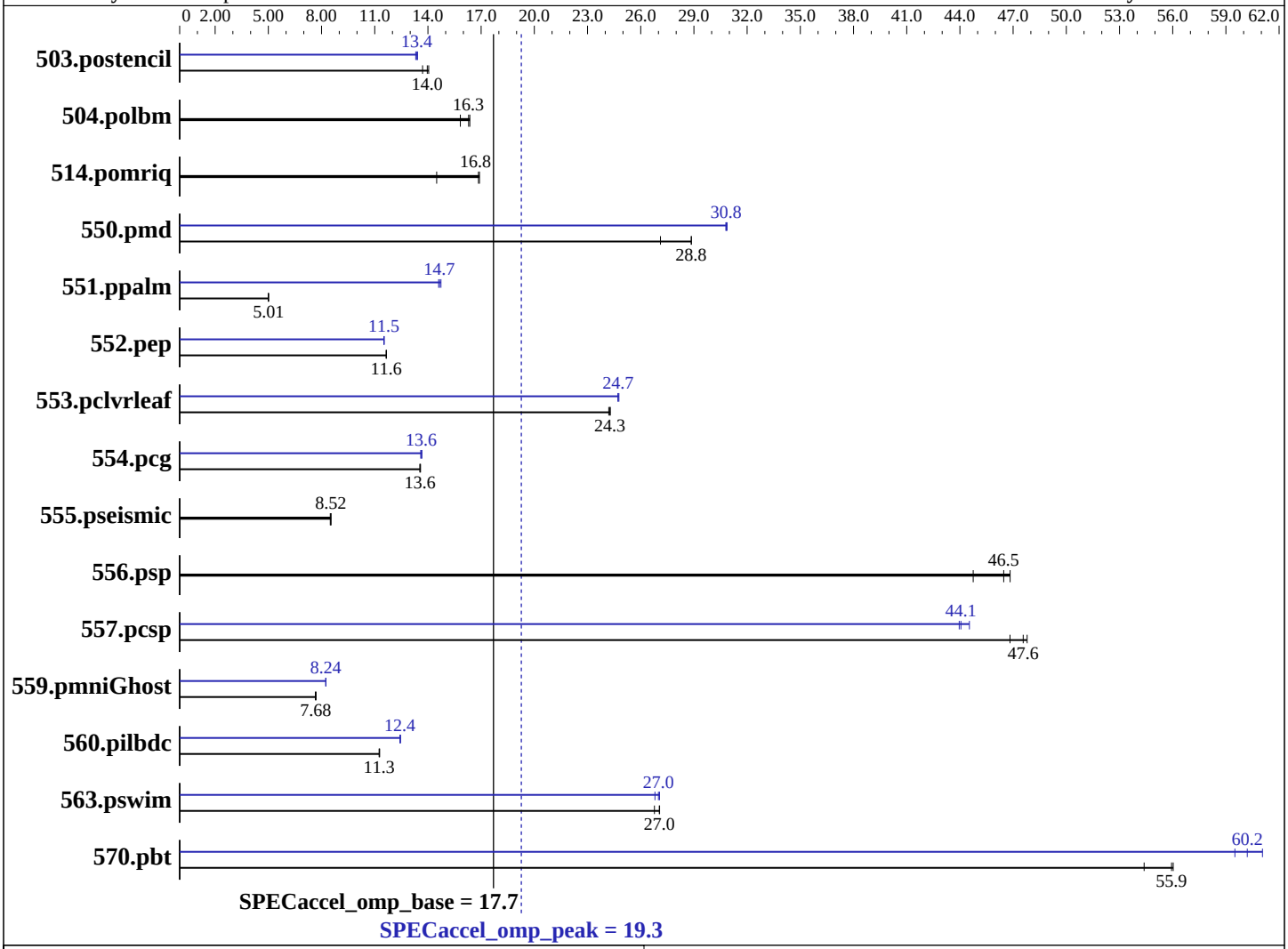
Supermicro
Intel Xeon Platinum 8490H
SuperServer SYS-221H-TNR

SPECaccel_omp_peak = 19.3

SPECaccel_omp_base = 17.7

ACCEL license: 001176
Test sponsor: Supermicro
Tested by: Supermicro

Test date: Jul-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022



Hardware

CPU Name:	Intel Xeon Platinum 8490H
CPU Characteristics:	Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz:	1900
CPU MHz Maximum:	3500
FPU:	Integrated
CPU(s) enabled:	120 cores, 2 chips, 60 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 chips
Primary Cache:	32 KB I + 48 KB D on chip per core
Secondary Cache:	2 MB I+D on chip per core
L3 Cache:	115200 KB I+D on chip per chip
Other Cache:	None

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Accelerator

Accel Model Name:	Intel Xeon Platinum 8490H
Accel Vendor:	Intel
Accel Name:	Intel Xeon Platinum 8490H
Type of Accel:	CPU
Accel Connection:	N/A
Does Accel Use ECC:	Yes
Accel Description:	2 x Intel Xeon Platinum 8490H
Accel Driver:	N/A

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Hardware (Continued)

Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Disk Subsystem: 1 x 960 GB NVMe SSD
Other Hardware: None

Software

Operating System: Ubuntu 22.04.2 LTS 5.15.0-76-generic
Compiler: C/C++/Fortran: Version 2023.1 of Intel oneAPI DPC++/C++
File System: ext4
System State: Run level 5 (multi-user)
Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.postencil	7.96	13.7	**7.81**	**14.0**	7.76	14.0	8.13	13.4	**8.15**	**13.4**	8.19	13.3
504.polbm	7.46	16.4	**7.49**	**16.3**	7.71	15.8	7.46	16.4	**7.49**	**16.3**	7.71	15.8
514.pomriq	**36.9**	**16.8**	36.7	16.9	42.8	14.5	**36.9**	**16.8**	36.7	16.9	42.8	14.5
550.pmd	8.89	27.1	**8.35**	**28.8**	8.35	28.9	7.82	30.8	7.81	30.9	**7.82**	**30.8**
551.ppalm	**109**	**5.01**	109	4.99	108	5.01	**37.1**	**14.7**	37.3	14.6	36.9	14.7
552.pep	**19.8**	**11.6**	19.8	11.7	19.8	11.6	**20.0**	**11.5**	20.1	11.5	20.0	11.5
553.pclvrleaf	47.3	24.2	47.2	24.3	**47.2**	**24.3**	46.3	24.7	46.2	24.8	**46.3**	**24.7**
554.pcg	24.5	13.6	24.6	13.5	**24.6**	**13.6**	24.4	13.7	**24.4**	**13.6**	24.5	13.6
555.pseismic	**33.1**	**8.52**	33.2	8.49	33.0	8.53	**33.1**	**8.52**	33.2	8.49	33.0	8.53
556.psp	17.5	46.8	**17.6**	**46.5**	18.3	44.7	17.5	46.8	**17.6**	**46.5**	18.3	44.7
557.pcsp	18.0	47.8	**18.1**	**47.6**	18.3	46.8	**19.5**	**44.1**	19.3	44.5	19.5	44.0
559.pmniGhost	51.7	7.69	51.9	7.65	**51.7**	**7.68**	48.1	8.25	**48.2**	**8.24**	48.2	8.24
560.pilbdc	**58.0**	**11.3**	57.9	11.3	58.1	11.2	52.4	12.5	52.5	12.4	**52.5**	**12.4**
563.pswim	5.87	27.1	5.94	26.8	**5.88**	**27.0**	5.93	26.8	5.88	27.1	**5.89**	**27.0**
570.pbt	**13.9**	**55.9**	13.9	56.0	14.3	54.4	12.8	61.1	13.1	59.5	**13.0**	**60.2**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Platform Notes

```
Sysinfo program /home/accel/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on lab Sat Jul  1 02:57:01 2023

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
```

Continued on next page

Platform Notes (Continued)

```
  http://www.spec.org/accel/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Platinum 8490H
      2 "physical id"s (chips)
      240 "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 : 60
      siblings  : 120
      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 56 57 58 59
      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 43 44 45 46
      47 48 49 50 51 52 53 54 55 56 57 58 59
   cache size : 115200 KB

From /proc/meminfo
   MemTotal:       1056462068 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   Ubuntu 22.04.2 LTS

From /etc/*release* /etc/*version*
   debian_version: bookworm/sid
   os-release:
      PRETTY_NAME="Ubuntu 22.04.2 LTS"
      NAME="Ubuntu"
      VERSION_ID="22.04"
      VERSION="22.04.2 LTS (Jammy Jellyfish)"
      VERSION_CODENAME=jammy
      ID=ubuntu
      ID_LIKE=debian
      HOME_URL="https://www.ubuntu.com/"

uname -a:
   Linux lab 5.15.0-76-generic #83-Ubuntu SMP Thu Jun 15 19:16:32 UTC 2023
   x86_64 x86_64 x86_64 GNU/Linux

run-level 5 Jul 1 02:41

SPEC is set to: /home/accel
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p2 ext4  879G  130G  705G  16% /
Additional information from dmidecode:
```

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Platform Notes (Continued)

```
     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.

    BIOS American Megatrends International, LLC. 1.3 06/01/2023
    Memory:
     16x NO DIMM NO DIMM
     16x SK Hynix HMCG94MEBRA109N 64 GB 2 rank 4800 MT/s

  (End of data from sysinfo program)
```

General Notes

```
------------------------------------------------------------------------
BIOS Setting:
    Power Performance Tuning = BIOS Controls EPB
    ENERGY_PERF_BIAS_CFG Mode = Extreme Performance
    UMA-Based Clustering = Disable (All2All)
------------------------------------------------------------------------
Spectre and Meltdown
    NA: The test sponsor attests, as of date of publication, the 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)
    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.
------------------------------------------------------------------------
OS tunning:
    Stack size set to unlimited using "ulimit -s unlimited"
------------------------------------------------------------------------
IPMI setting:
    Fan Mode: Full Speed
```

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
icc ifort

Base Portability Flags

503.postencil: -DSPEC_USE_INNER_SIMD
504.polbm: -DSPEC_USE_INNER_SIMD
514.pomriq: -DSPEC_USE_INNER_SIMD
550.pmd: -DSPEC_USE_INNER_SIMD -80
551.ppalm: -DSPEC_USE_INNER_SIMD
552.pep: -DSPEC_USE_INNER_SIMD
553.pclvrleaf: -DSPEC_USE_INNER_SIMD
554.pcg: -DSPEC_USE_INNER_SIMD
555.pseismic: -DSPEC_USE_INNER_SIMD
556.psp: -DSPEC_USE_INNER_SIMD
557.pcsp: -DSPEC_USE_INNER_SIMD
559.pmniGhost: -DSPEC_USE_INNER_SIMD -nofor-main
560.pilbdc: -DSPEC_USE_INNER_SIMD
563.pswim: -DSPEC_USE_INNER_SIMD
570.pbt: -DSPEC_USE_INNER_SIMD

Base Optimization Flags

C benchmarks:
-Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt -qopenmp
-qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log

Fortran benchmarks:
-Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt -qopenmp
-qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log

Benchmarks using both Fortran and C:
-Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt -qopenmp
-qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log

Peak Compiler Invocation

C benchmarks (except as noted below):
icc

557.pcsp: icx

Continued on next page

Peak Compiler Invocation (Continued)

570.pbt: icx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
icc ifort

Peak Portability Flags

503.postencil: -DSPEC_USE_INNER_SIMD
504.polbm: -DSPEC_USE_INNER_SIMD
514.pomriq: -DSPEC_USE_INNER_SIMD
550.pmd: -DSPEC_USE_INNER_SIMD -80
551.ppalm: -DSPEC_USE_INNER_SIMD -DSPEC_HOST_FFTW3
552.pep: -DSPEC_USE_INNER_SIMD
553.pclvrleaf: -DSPEC_USE_INNER_SIMD
554.pcg: -DSPEC_USE_INNER_SIMD
555.pseismic: -DSPEC_USE_INNER_SIMD
556.psp: -DSPEC_USE_INNER_SIMD
557.pcsp: -DSPEC_USE_INNER_SIMD
559.pmniGhost: -DSPEC_USE_INNER_SIMD -nofor-main
560.pilbdc: -DSPEC_USE_INNER_SIMD
563.pswim: -DSPEC_USE_INNER_SIMD
570.pbt: -DSPEC_USE_INNER_SIMD

Peak Optimization Flags

C benchmarks:

503.postencil: -Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt
-qopenmp -qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log

504.polbm: basepeak = yes

514.pomriq: basepeak = yes

552.pep: -Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt
-qopenmp -qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log
-qopt-streaming-stores always -fimf-precision=low

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Peak Optimization Flags (Continued)

554.pcg: Same as 503.postencil

557.pcsp: -O3 -Ofast -xCORE-AVX512 -mprefer-vector-width=512
-qopt-multiple-gather-scatter-by-shuffles -fiopenmp
-ffast-math -flto -funroll-loops -fimf-precision=low

570.pbt: Same as 557.pcsp

Fortran benchmarks:

550.pmd: -Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt
-qopenmp -qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log
-fimf-precision=low -ip

551.ppalm: -Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt
-qopenmp -qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log
-I/home/fftW-3.3.10/include -L/home/fftw-3.3.10/lib

555.pseismic: basepeak = yes

556.psp: basepeak = yes

560.pilbdc: -Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt
-qopenmp -qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log

563.pswim: Same as 560.pilbdc

Benchmarks using both Fortran and C:
-Ofast -xCORE-AVX512 -qopt-zmm-usage=high -no-prec-sqrt -qopenmp
-qopenmp-offload=host -ipo -ansi-alias
-qopt-multiple-gather-scatter-by-shuffles
-fimf-precision=low:exp,sin,cos,sincos,log

Peak Other Flags

Fortran benchmarks:

551.ppalm: -lfftw3

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The flags files that were used to format this result can be browsed at
https://www.spec.org/accel/flags/Intel-icc2021.2-linux64.20230726.html
https://www.spec.org/accel/flags/Supermicro-Platform-Settings-V1.2-SPR-revC.html

You can also download the XML flags sources by saving the following links:
https://www.spec.org/accel/flags/Intel-icc2021.2-linux64.20230726.xml
https://www.spec.org/accel/flags/Supermicro-Platform-Settings-V1.2-SPR-revC.xml

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