SPEC ACCEL™ OMP Result

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Intel
Intel Xeon Platinum 8358

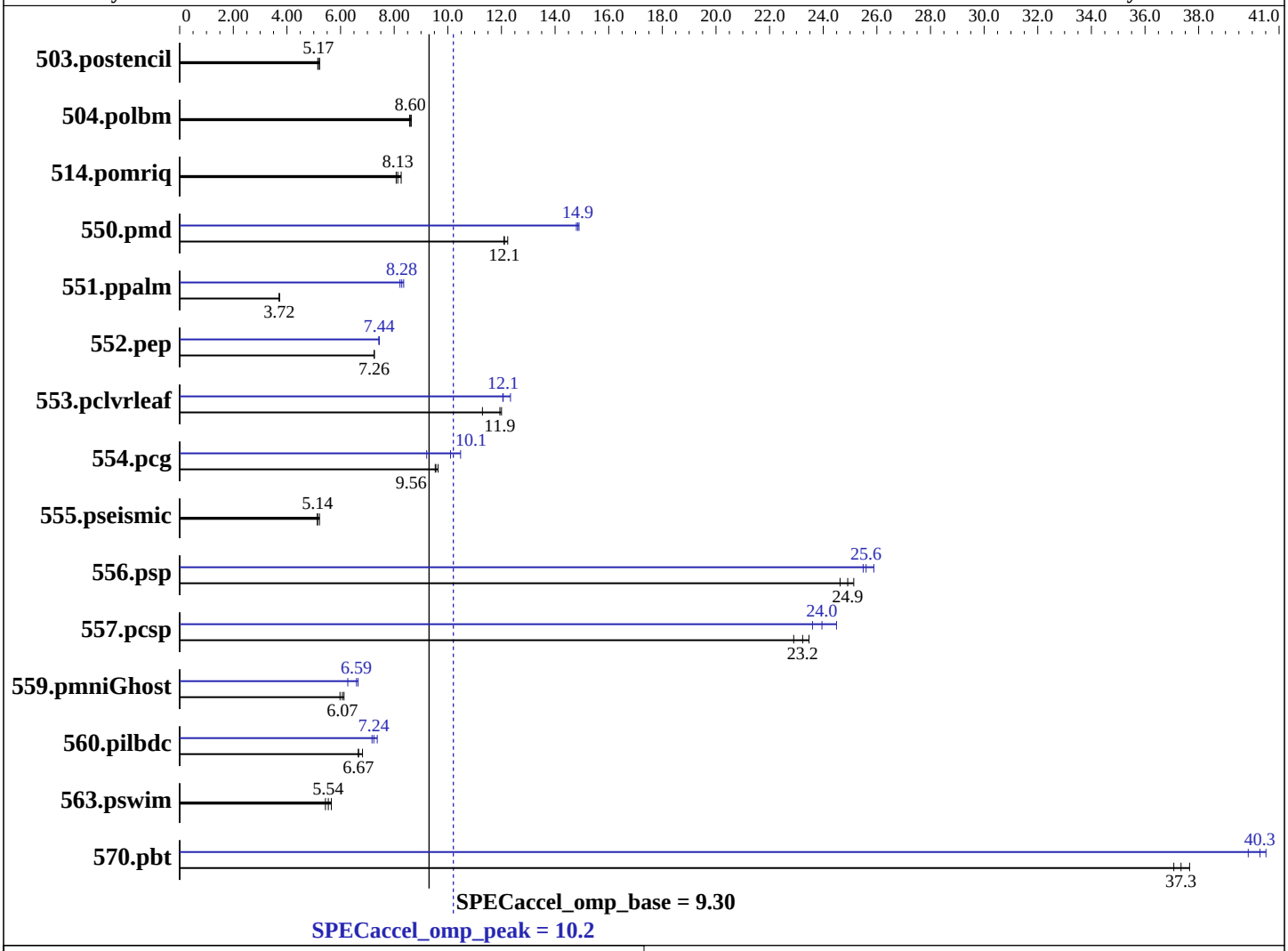
Intel Server System M50CYP2SBSTD (Intel Xeon Platinum 8358, 2.60 GHz)

SPECaccel_omp_peak = 10.2

SPECaccel_omp_base = 9.30

ACCEL license: 13
Test sponsor: Intel
Tested by: Intel

Test date: May-2021
Hardware Availability: Apr-2021
Software Availability: Feb-2021



Hardware

CPU Name:	Intel Xeon Platinum 8358
CPU Characteristics:	Simultaneous multithreading (SMT) ON, Turbo ON
CPU MHz:	2600
CPU MHz Maximum:	3400
FPU:	Integrated
CPU(s) enabled:	64 cores, 2 chips, 32 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:	1280 KB I+D on chip per core
L3 Cache:	48 MB I+D on chip per chip
Other Cache:	None

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Accelerator

Accel Model Name:	Intel Xeon Platinum 8358
Accel Vendor:	Intel
Accel Name:	Intel Xeon Platinum 8358
Type of Accel:	CPU
Accel Connection:	N/A
Does Accel Use ECC:	yes
Accel Description:	3rd Generation Intel Xeon Scalable Processor SMT ON, Turbo ON
Accel Driver:	N/A

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Hardware (Continued)

Memory: 256 GB (16 x 16 GB 2Rx8 DDR4-3200Y-R ECC Registered)
Disk Subsystem: 269 TB Panasas ActiveStor 20
Other Hardware: None

Software

Operating System: CentOS Linux release 8.3.2011 4.18.0-240.22.1.el8_3.crt1.x86_64
Compiler: C/C++/Fortran: Version 2021.2.0 of Intel Classic Compiler for Linux Build
File System: panfs
System State: Run level 3 (default)
Other Software: FFTW 3.3.9

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.postencil	21.2	5.15	**21.1**	**5.17**	20.9	5.22	21.2	5.15	**21.1**	**5.17**	20.9	5.22
504.polbm	14.1	8.64	14.2	8.57	**14.2**	**8.60**	14.1	8.64	14.2	8.57	**14.2**	**8.60**
514.pomriq	75.2	8.26	**76.4**	**8.13**	76.9	8.07	75.2	8.26	**76.4**	**8.13**	76.9	8.07
550.pmd	**19.9**	**12.1**	19.7	12.2	19.9	12.1	16.2	14.9	**16.2**	**14.9**	16.3	14.8
551.ppalm	146	3.72	146	3.71	**146**	**3.72**	65.1	8.35	66.2	8.22	**65.7**	**8.28**
552.pep	31.9	7.25	**31.8**	**7.26**	31.8	7.26	31.0	7.44	**31.1**	**7.44**	31.1	7.43
553.pclvrleaf	95.4	12.0	101	11.3	**95.9**	**11.9**	92.8	12.3	**94.9**	**12.1**	95.0	12.1
554.pcg	**34.8**	**9.56**	34.9	9.53	34.6	9.64	**33.0**	**10.1**	36.2	9.21	31.8	10.5
555.pseismic	**54.8**	**5.14**	54.1	5.21	54.9	5.13	**54.8**	**5.14**	54.1	5.21	54.9	5.13
556.psp	**32.8**	**24.9**	32.5	25.1	33.2	24.6	**32.0**	**25.6**	31.6	25.9	32.1	25.5
557.pcsp	**37.0**	**23.2**	36.6	23.5	37.5	22.9	35.1	24.5	36.4	23.6	**35.9**	**24.0**
559.pmniGhost	**65.4**	**6.07**	66.4	5.98	64.8	6.13	63.3	6.27	**60.2**	**6.59**	59.7	6.66
560.pilbdc	98.0	6.66	95.8	6.82	**97.9**	**6.67**	88.6	7.37	**90.2**	**7.24**	91.0	7.17
563.pswim	28.1	5.66	29.2	5.44	**28.7**	**5.54**	28.1	5.66	29.2	5.44	**28.7**	**5.54**
570.pbt	**20.9**	**37.3**	21.0	37.1	20.7	37.7	19.3	40.5	**19.4**	**40.3**	19.6	39.8

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

Platform Notes

```
Sysinfo program /panfs/projects/innl/abobyr/SpecACCEL_OMP/kits/8358/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on eif371 Wed May  5 01:40:36 2021
```

Continued on next page

Platform Notes (Continued)

```
This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/accel/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Platinum 8358 CPU @ 2.60GHz
      2 "physical id"s (chips)
      128 "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 : 32
      siblings  : 64
      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
      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
   cache size : 49152 KB

From /proc/meminfo
   MemTotal:       263790792 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   centos-release: CentOS Linux release 8.3.2011
   centos-release-upstream: Derived from Red Hat Enterprise Linux 8.3
   os-release:
      NAME="CentOS Linux"
      VERSION="8"
      ID="centos"
      ID_LIKE="rhel fedora"
      VERSION_ID="8"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="CentOS Linux 8"
      ANSI_COLOR="0;31"
   redhat-release: CentOS Linux release 8.3.2011
   system-release: CentOS Linux release 8.3.2011
   system-release-cpe: cpe:/o:centos:centos:8

uname -a:
   Linux eif371 4.18.0-240.22.1.el8_3.crt1.x86_64 #1 SMP Thu Apr 8 10:38:43 MDT
   2021 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 4 10:10

SPEC is set to: /panfs/projects/innl/abobyr/SpecACCEL_OMP/kits/8358
   Filesystem                Type   Size  Used Avail Use% Mounted on
   panfs://36.101.212.1/innl panfs  269T  206T   64T  77% /global/panfs02/innl
```

Continued on next page

Platform Notes (Continued)

```
Additional information from dmidecode:

   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.


(End of data from sysinfo program)
```

General Notes

```
Spectre and Meltdown
Yes: 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, that 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.
```

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

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Base Portability Flags (Continued)

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

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

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

Peak Compiler Invocation

C benchmarks:
icc

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

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Peak Portability Flags (Continued)

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: basepeak = yes

504.polbm: basepeak = yes

514.pomriq: basepeak = yes

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

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

557.pcsp: Same as 554.pcg

570.pbt: -qopenmp -qopenmp-offload=host -Ofast -xCORE-AVX512
-fimf-precision=low:exp,sin,cos,sincos,log -no-prec-sqrt
-qopt-multiple-gather-scatter-by-shuffles

Fortran benchmarks:

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

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Peak Optimization Flags (Continued)

551.ppalm: `-qopenmp -qopenmp-offload=host -Ofast -xCORE-AVX512 -fimf-precision=low:exp,sin,cos,sincos,log -no-prec-sqrt -qopt-multiple-gather-scatter-by-shuffles -I/home/abobyr/FFTW-3.3.9/include -L/home/abobyr/FFTW-3.3.9/lib`

555.pseismic: `basepeak = yes`

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

560.pilbdc: `-qopenmp -qopenmp-offload=host -Ofast -xCORE-AVX512 -qopt-zmm-usage=high -fimf-precision=low:exp,sin,cos,sincos,log -no-prec-sqrt -qopt-multiple-gather-scatter-by-shuffles -qopt-streaming-stores always -qopt-prefetch=5`

563.pswim: `basepeak = yes`

Benchmarks using both Fortran and C:

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

559.pmniGhost: `-qopenmp -qopenmp-offload=host -Ofast -xCORE-AVX512 -qopt-zmm-usage=high -fimf-precision=low:exp,sin,cos,sincos,log -no-prec-sqrt -qopt-multiple-gather-scatter-by-shuffles`

Peak Other Flags

Fortran benchmarks:

551.ppalm: `-lfftw3`

The flags file that was used to format this result can be browsed at
`https://www.spec.org/accel/flags/Intel-icc2021.2-linux64.html`

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Test sponsor:	Intel	**Hardware Availability:**	Apr-2021
Tested by:	Intel	**Software Availability:**	Feb-2021

You can also download the XML flags source by saving the following link:
`https://www.spec.org/accel/flags/Intel-icc2021.2-linux64.xml`

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Tested with SPEC ACCEL v1.3.
Report generated on Fri May 21 11:20:07 2021 by SPEC ACCEL PS/PDF formatter v1290.
Originally published on 19 May 2021.