SPEC ACCEL™ OMP Result

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Intel
Intel Xeon Platinum 8180

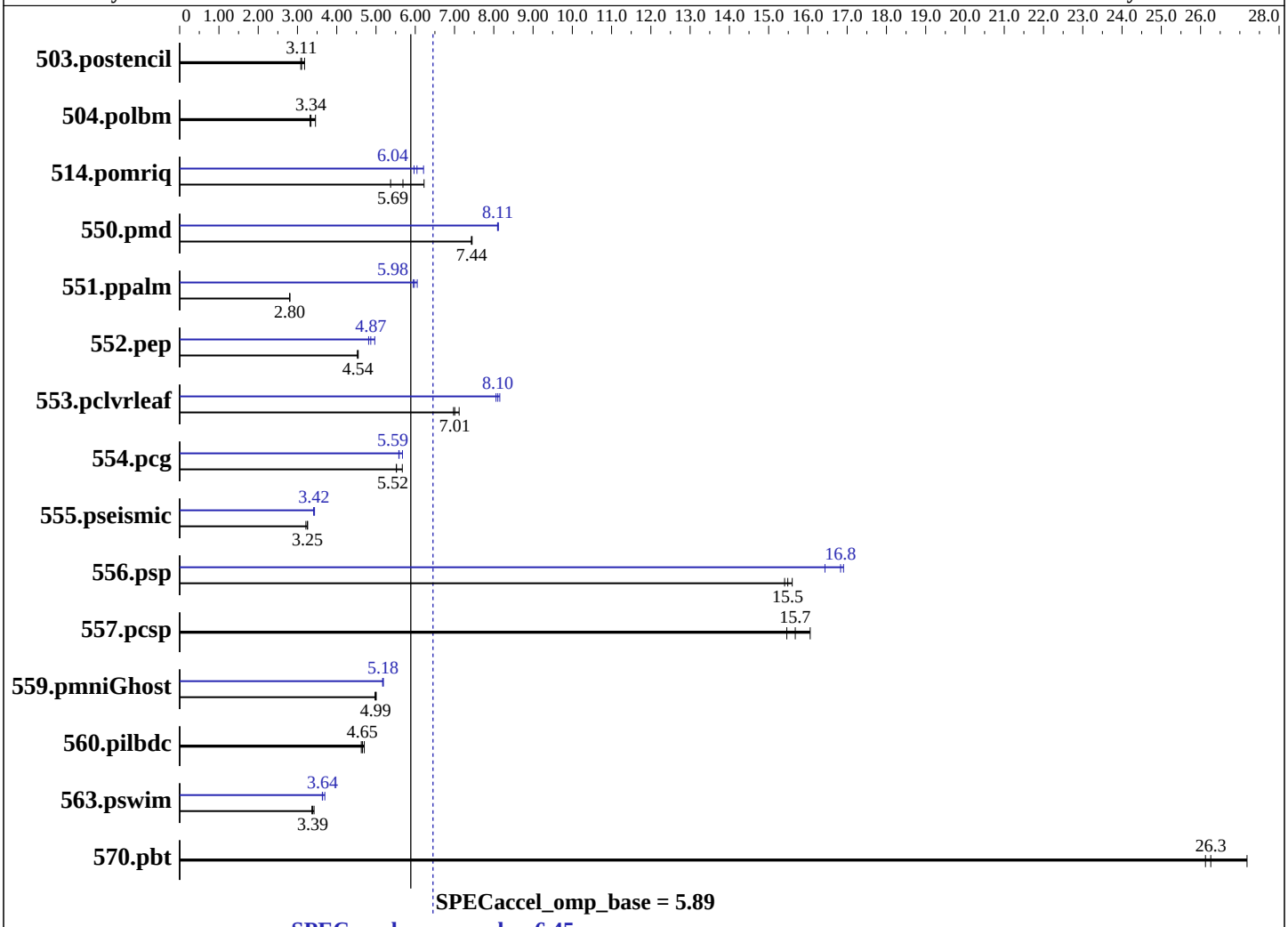
Intel Server System R2208WFTZS (2 x Intel Xeon Platinum 8180, 2.50 GHz, SMT ON, Turbo ON)

SPECaccel_omp_peak = 6.45

SPECaccel_omp_base = 5.89

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

Test date: Jul-2017
Hardware Availability: Jul-2017
Software Availability: Oct-2017



Hardware

CPU Name:	Intel Xeon Platinum 8180
CPU Characteristics:	Simultaneous multithreading (SMT) ON, Turbo ON
CPU MHz:	2500
CPU MHz Maximum:	3800
FPU:	Integrated
CPU(s) enabled:	56 cores, 2 chips, 28 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	38.5 MB I+D on chip per chip
Other Cache:	None

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Accelerator

Accel Model Name:	Intel Xeon Platinum 8180
Accel Vendor:	Intel
Accel Name:	Intel Xeon Platinum 8180
Type of Accel:	CPU
Accel Connection:	N/A
Does Accel Use ECC:	yes
Accel Description:	2 x Intel Xeon Platinum 8180, 2.50 GHz, SMT ON, Turbo ON
Accel Driver:	N/A

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Hardware (Continued)

Memory: 192 GB (16 x 12 GB 2Rx4 DDR4-2666 ECC Registered)
Disk Subsystem: 108 TB Panasas ActiveStor 14
Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 7.3 (Maipo) 3.10.0-514.6.2.0.1.el7.x86_64.knl1
Compiler: C/C++/Fortran: Version 18.0 of Intel Composer XE for Linux Build
File System: panfs
System State: Run level 3 (default)
Other Software: FFTW 3.3.6

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.postencil	35.3	3.09	34.3	3.18	**35.1**	**3.11**	35.3	3.09	34.3	3.18	**35.1**	**3.11**
504.polbm	36.7	3.32	**36.5**	**3.34**	35.3	3.46	36.7	3.32	**36.5**	**3.34**	35.3	3.46
514.pomriq	99.8	6.22	116	5.37	**109**	**5.69**	100	6.21	104	5.97	**103**	**6.04**
550.pmd	32.4	7.45	32.4	7.43	**32.4**	**7.44**	**29.7**	**8.11**	29.8	8.10	29.7	8.12
551.ppalm	**194**	**2.80**	194	2.81	194	2.80	91.5	5.95	**91.0**	**5.98**	89.9	6.05
552.pep	50.8	4.55	**50.9**	**4.54**	51.0	4.53	48.0	4.81	**47.5**	**4.87**	46.5	4.97
553.pclvrleaf	**163**	**7.01**	161	7.12	164	6.97	**141**	**8.10**	142	8.06	140	8.15
554.pcg	58.7	5.67	**60.3**	**5.52**	60.3	5.52	58.7	5.67	59.7	5.58	**59.6**	**5.59**
555.pseismic	87.7	3.21	**86.7**	**3.25**	86.5	3.26	82.7	3.41	**82.4**	**3.42**	82.1	3.43
556.psp	53.1	15.4	52.4	15.6	**52.8**	**15.5**	49.8	16.4	**48.6**	**16.8**	48.4	16.9
557.pcsp	55.6	15.5	**54.8**	**15.7**	53.5	16.1	55.6	15.5	**54.8**	**15.7**	53.5	16.1
559.pmniGhost	79.3	5.01	79.8	4.97	**79.5**	**4.99**	76.8	5.17	76.5	5.19	**76.7**	**5.18**
560.pilbdc	139	4.70	**140**	**4.65**	141	4.63	139	4.70	**140**	**4.65**	141	4.63
563.pswim	**46.9**	**3.39**	46.5	3.42	47.2	3.37	**43.7**	**3.64**	43.8	3.63	43.0	3.70
570.pbt	29.9	26.1	28.7	27.2	**29.7**	**26.3**	29.9	26.1	28.7	27.2	**29.7**	**26.3**

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/kit1.2_skx2S8180_18.0/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on eps01 Mon Jul 17 19:56:21 2017
```

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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 8180 CPU @ 2.50GHz
      2 "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 : 28
      siblings  : 56
      physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
   cache size : 39424 KB

From /proc/meminfo
   MemTotal:       196699188 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   oracle-release: Oracle Linux Server release 7.3
   os-release:
      NAME="Oracle Linux Server"
      VERSION="7.3"
      ID="ol"
      VERSION_ID="7.3"
      PRETTY_NAME="Oracle Linux Server 7.3"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:oracle:linux:7:3:server"
      HOME_URL="https://linux.oracle.com/"
   redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
   system-release: Oracle Linux Server release 7.3
   system-release-cpe: cpe:/o:oracle:linux:7:3:server

uname -a:
   Linux eps01 3.10.0-514.6.2.0.1.el7.x86_64.knl1 #1 SMP Thu Mar 2 10:19:17 MST
   2017 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 14 11:41

SPEC is set to:
/panfs/projects/innl/abobyr/SpecACCEL_OMP/kits/kit1.2_skx2S8180_18.0
   Filesystem                Type   Size  Used Avail Use% Mounted on
```

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Platform Notes (Continued)

```
    panfs://36.101.212.1/innl panfs  108T   41T   68T  38% /global/panfs02/innl
 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

```
Used Environment Variables:
  ENV_KMP_AFFINITY=compact,0 - assign OpenMP Threads continously
  ENV_OMP_NUM_THREADS=112 - limits number of Threads to be started
  ENV_KMP_HW_SUBSET=2S,28C,2T - control Thread distribution accross sockets, cores and hw threads
  ENV_FORT_BUFFERED=true - enables buffered I/O for Fortran
  ENV_OMP_DYNAMIC=FALSE - disable the dynamic adjustment of the number of threads within a team
  ENV_KMP_LIBRARY=turnaround - selects the OpenMP runtime library throughput
  ENV_KMP_BLOCKTIME=infinite - sets the time, in milliseconds, that a thread should wait,
  after completing the execution of a parallel region, before sleeping.
```

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

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Base Portability Flags (Continued)

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:
-O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host

Fortran benchmarks:
-O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host

Benchmarks using both Fortran and C:
-O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host

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
552.pep: -DSPEC_USE_INNER_SIMD
553.pclvrleaf: -DSPEC_USE_INNER_SIMD
554.pcg: -DSPEC_USE_INNER_SIMD

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Peak Portability Flags (Continued)

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: -O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host
-qopt-streaming-stores always -ipo

552.pep: -O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host
-qopt-streaming-stores always

554.pcg: -O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host

557.pcsp: basepeak = yes

570.pbt: basepeak = yes

Fortran benchmarks:

550.pmd: -O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low

551.ppalm: -O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host
-I/home/abobyr/FFTW-3.3.6_SKL/include
-L/home/abobyr/FFTW-3.3.6_SKL/lib

555.pseismic: -O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host

556.psp: -O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host -ipo

560.pilbdc: basepeak = yes

563.pswim: Same as 555.pseismic

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

553.pclvrleaf: `-O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host -qopt-streaming-stores always`

559.pmniGhost: `-O3 -xCOMMON-AVX512 -qopenmp -qopenmp-offload=host`

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-icc18.0-linux64.20170802.00.html`

You can also download the XML flags source by saving the following link:
`https://www.spec.org/accel/flags/Intel-icc18.0-linux64.20170802.00.xml`

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For other inquiries, please contact webmaster@spec.org.

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