



# SPEC ACCEL™ OMP Result

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## Intel Intel Xeon Platinum 8180

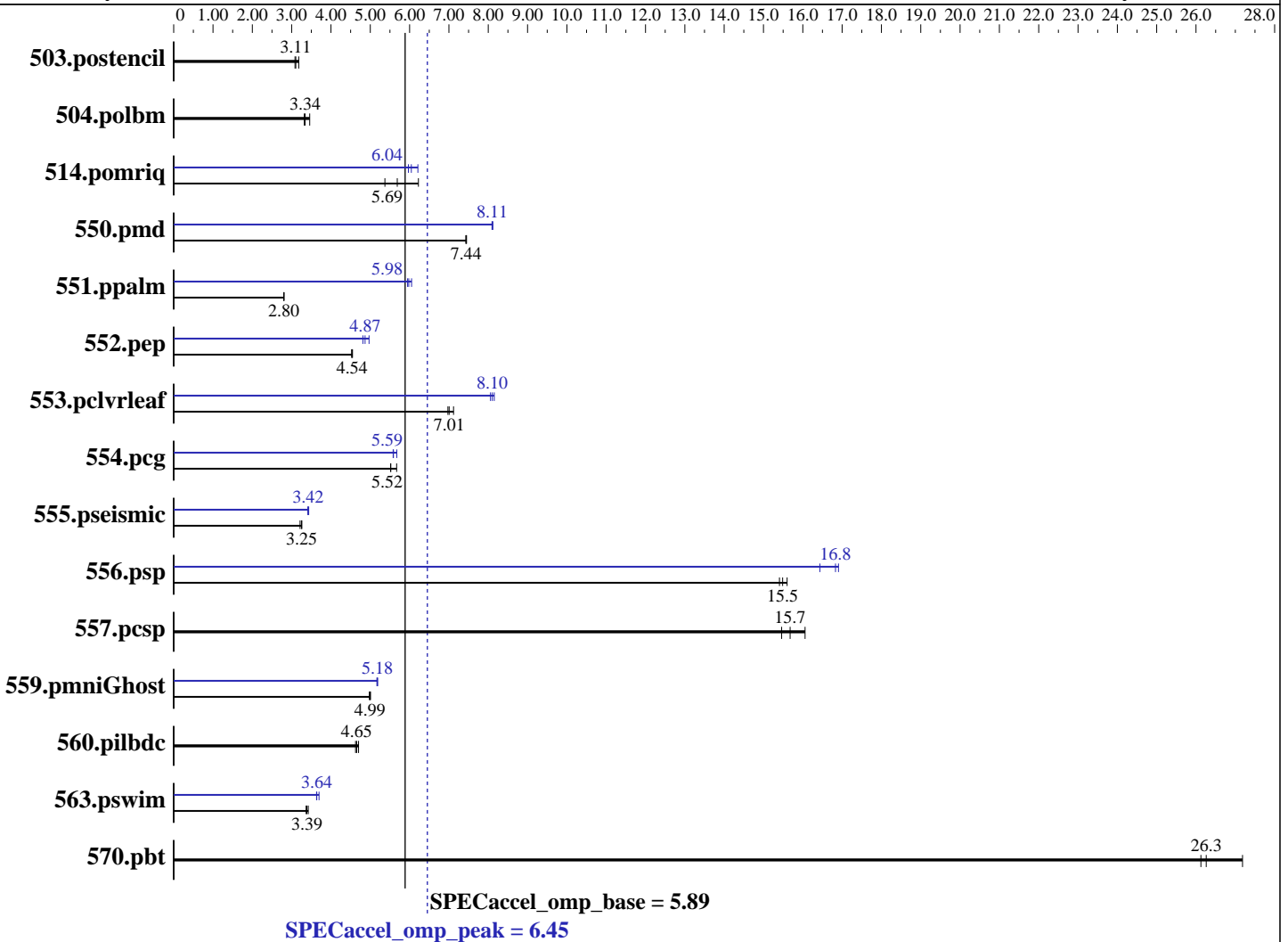
Intel Server System R2208WFTZS (2 x Intel Xeon Platinum 8180, 2.50 GHz, SMT ON, Turbo ON)

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

Continued on next page

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

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 $$ c05a7f14b1b1765e3felfdf68447e8a35
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 continuously  
ENV\_OMP\_NUM\_THREADS=112 - limits number of Threads to be started  
ENV\_KMP\_HW\_SUBSET=2S,28C,2T - control Thread distribution across 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.ppep: -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.ppalp: -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.pcp: -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/abobyrr/FFTW-3.3.6\_SKL/include  
-L/home/abobyrr/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 questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC ACCEL v1.2.  
Report generated on Wed Aug 2 12:35:23 2017 by SPEC ACCEL PS/PDF formatter v1290.  
Originally published on 2 August 2017.