



SPEC ACCEL™ OMP Result

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Intel Intel Xeon Phi CPU 7250F

SPECaccel_omp_peak = 7.55

Endeavour Node(Intel Xeon Phi CPU 7250F,
1.40 GHz, SMT ON, Turbo ON, flat MCDRAM)

SPECaccel_omp_base = 6.14

ACCEL license: 13

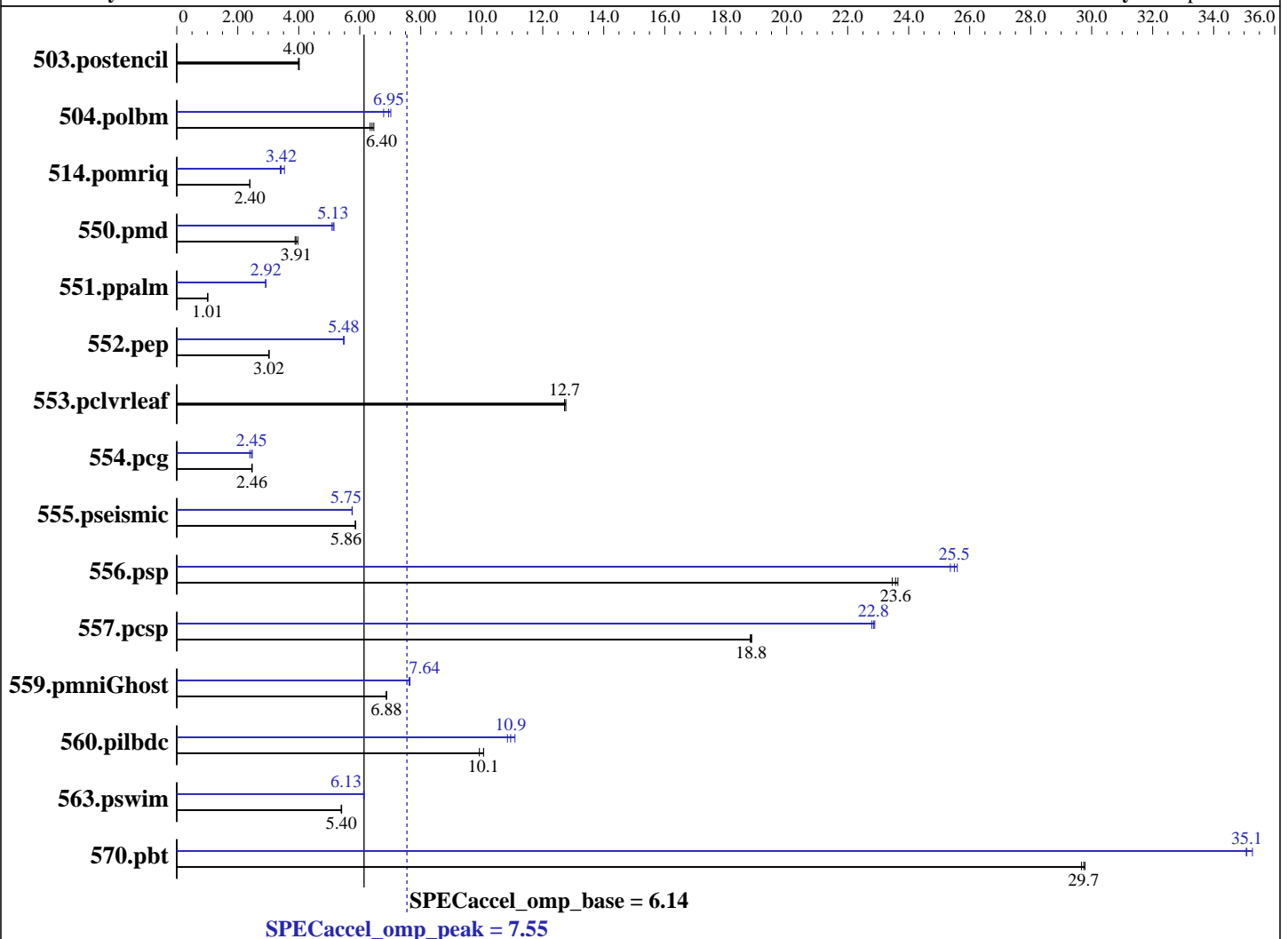
Test date: Jun-2017

Test sponsor: Intel

Hardware Availability: Dec-2016

Tested by: Intel

Software Availability: Sep-2017



Hardware

CPU Name: Intel Xeon Phi 7250F
 CPU Characteristics: Simultaneous multithreading (SMT) ON, Turbo ON
 CPU MHz: 1400
 CPU MHz Maximum: 1600
 FPU: Integrated
 CPU(s) enabled: 68 cores, 1 chip, 68 cores/chip, 4 threads/core
 CPU(s) orderable: 1 to 1 chip
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 1 MB I+D on chip per 2 cores
 L3 Cache: None
 Other Cache: None

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Accelerator

Accel Model Name: Intel Xeon Phi CPU 7250F
 Accel Vendor: Intel
 Accel Name: Intel Xeon Phi CPU 7250F
 Type of Accel: CPU
 Accel Connection: N/A
 Does Accel Use ECC: yes
 Accel Description: Second generation Xeon Phi self-bootable CPU
 SMT ON, Turbo ON, MCDRAM flat mode
 Accel Driver: N/A



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Hardware (Continued)

Memory: 96 GB (6 x 16 GB 2Rx8 PC4-2400T-R
ECC Registered) + 16 GB MCDRAM (flat)
Disk Subsystem: 108 TB Panasas ActiveStor 14
Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 7.3
(Maipo)
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	<u>27.3</u>	<u>4.00</u>	27.1	4.02	27.3	3.99	<u>27.3</u>	<u>4.00</u>	27.1	4.02	27.3	3.99
504.polbm	19.2	6.34	<u>19.0</u>	<u>6.40</u>	18.9	6.46	17.4	7.02	<u>17.6</u>	<u>6.95</u>	18.0	6.78
514.pomriq	259	2.40	<u>259</u>	<u>2.40</u>	259	2.40	176	3.53	183	3.39	<u>181</u>	<u>3.42</u>
550.pmd	62.1	3.88	60.7	3.97	<u>61.6</u>	<u>3.91</u>	47.4	5.09	<u>47.0</u>	<u>5.13</u>	46.7	5.16
551.ppalms	538	1.01	<u>537</u>	<u>1.01</u>	536	1.01	<u>186</u>	<u>2.92</u>	186	2.92	187	2.92
552.pep	<u>76.4</u>	<u>3.02</u>	76.4	3.02	76.4	3.02	42.1	5.48	42.2	5.47	<u>42.2</u>	<u>5.48</u>
553.pclvrleaf	<u>90.0</u>	<u>12.7</u>	89.7	12.8	90.1	12.7	<u>90.0</u>	<u>12.7</u>	89.7	12.8	90.1	12.7
554.pcg	135	2.46	134	2.48	<u>135</u>	<u>2.46</u>	139	2.39	134	2.48	<u>136</u>	<u>2.45</u>
555.pseismic	48.2	5.85	48.1	5.86	<u>48.1</u>	<u>5.86</u>	<u>49.0</u>	<u>5.75</u>	49.1	5.75	49.0	5.76
556.psp	<u>34.7</u>	<u>23.6</u>	34.6	23.6	34.9	23.5	<u>32.1</u>	<u>25.5</u>	32.2	25.4	32.0	25.6
557.pcsp	45.6	18.9	<u>45.6</u>	<u>18.8</u>	45.7	18.8	37.5	22.9	<u>37.6</u>	<u>22.8</u>	37.7	22.8
559.pmniGhost	57.7	6.88	<u>57.7</u>	<u>6.88</u>	57.8	6.87	<u>52.0</u>	<u>7.64</u>	52.1	7.61	51.9	7.65
560.pilbdc	65.8	9.92	<u>64.9</u>	<u>10.1</u>	64.9	10.1	<u>59.6</u>	<u>10.9</u>	58.9	11.1	60.2	10.8
563.pswim	<u>29.5</u>	<u>5.40</u>	29.5	5.39	29.4	5.41	<u>25.9</u>	<u>6.13</u>	26.0	6.13	25.9	6.15
570.pbt	<u>26.2</u>	<u>29.7</u>	26.3	29.7	26.2	29.8	22.1	35.3	<u>22.2</u>	<u>35.1</u>	22.2	35.1

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

Submit Notes

The config file option 'submit' was used.
The following expression was used for the submit command:
submit = numactl -m 1 \$command

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Submit Notes (Continued)

The following additional kernel-options were used:
rcu_nocbs=2-271 nohz_full=2-271

Platform Notes

Sysinfo program

```
/panfs/projects/innl/abobyr/SpecACCEL_OMP/kits/kit1.2_knl_18.0/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3feldf68447e8a35
running on ekf106 Fri Jun 30 11:58:43 2017
```

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 Phi(TM) CPU 7250F @ 1.40GHz
 1 "physical id"s (chips)
272 "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 : 68
  siblings  : 272
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 18 19 20 21 22 23
24 25 26 27 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
51 52 53 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73
cache size : 1024 KB
```

From /proc/meminfo

```
MemTotal: 115390452 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)
ssf-release:
SSF_VERSION=core-2016.0:hpc-cluster-2016.0:compat-base-2016.0:compat-hpc-2016.0
system-release: Oracle Linux Server release 7.3
```

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Platform Notes (Continued)

system-release-cpe: cpe:/o:oracle:linux:7:3:server

uname -a:

```
Linux ekf106 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 Jun 29 18:09

SPEC is set to: /panfs/projects/innl/abobyr/SpecACCEL_OMP/kits/kit1.2_knl_18.0
Filesystem Type Size Used Avail Use% Mounted on
panfs://36.101.212.1/innl panfs 108T 40T 69T 37% /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=136 - limits number of Threads to be started
ENV_KMP_HW_SUBSET=1S,68C,2T - control Thread distribution across sockets, cores and hw threads
ENV_FORT_BUFFERED=true - enables buffered I/O for Fortran
```

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

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Base Portability Flags (Continued)

```
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:
-O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/

Fortran benchmarks:
-O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/

Benchmarks using both Fortran and C:
-O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/

Peak Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
icc ifort



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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: basepeak = yes
504.polbm: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/ -qopt-prefetch=5
514.pomriq: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/ -qopt-prefetch=5
-no-prec-sqrt
552.pep: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/ -qopt-streaming-stores always
554.pcg: Same as 504.polbm
557.pcsp: Same as 504.polbm
570.pbt: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/

Fortran benchmarks:

550.pmd: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/ -fimf-precision=low

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Peak Optimization Flags (Continued)

551.ppalm: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-no-prec-sqrt -I/home/abobyrr/FFTW-3.3.6/include
-L/home/abobyrr/FFTW-3.3.6/lib

555.pseismic: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log, /

556.psp: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log, / -qopt-prefetch=2

560.pilbdc: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log, / -qopt-prefetch=5

563.pswim: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log, /
-qopt-streaming-stores always

Benchmarks using both Fortran and C:

553.pclvrleaf: basepeak = yes

559.pmniGhost: -O3 -xMIC-AVX512 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log, / -qopt-prefetch=3
-qopt-streaming-stores always

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.html>

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



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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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