



# SPEC ACCEL™ OMP Result

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## Intel Intel Xeon E5-2697 v4

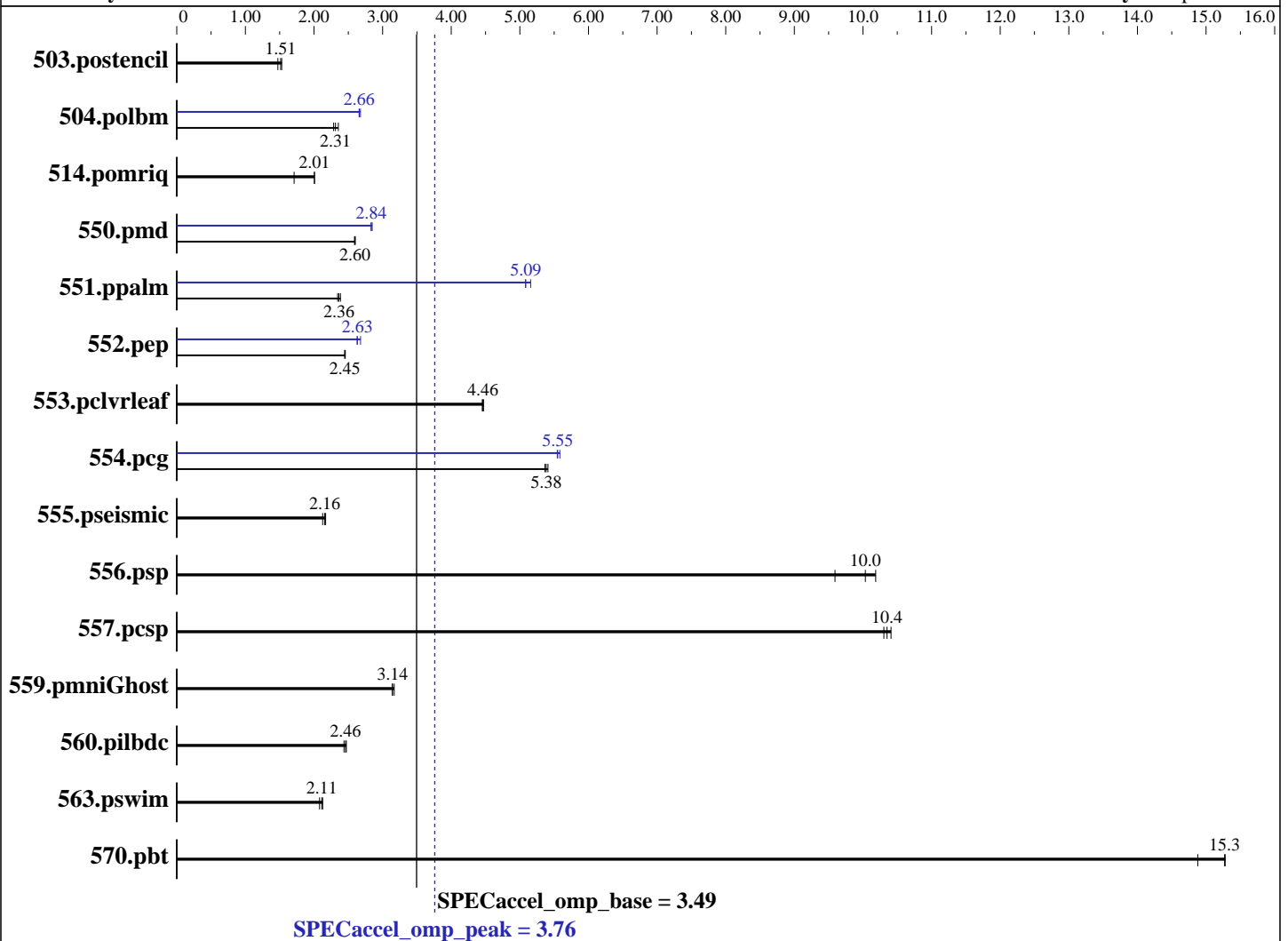
Endeavour Node(Intel Xeon E5-2697 v4, 2.3GHz,  
DDR4-2400 MHz, SMT ON, Turbo ON)

SPECaccel\_omp\_peak = 3.76

SPECaccel\_omp\_base = 3.49

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

Test date: May-2017  
Hardware Availability: Mar-2016  
Software Availability: Apr-2017



### Hardware

CPU Name: Intel Xeon E5-2697 v4  
 CPU Characteristics: SMT is on, Turbo is on  
 CPU MHz: 2300  
 CPU MHz Maximum: 3600  
 FPU: Integrated  
 CPU(s) enabled: 36 cores, 2 chips, 18 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: 256 KB I+D on chip per core  
 L3 Cache: 45 MB I+D on chip per chip  
 Other Cache: None

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### Accelerator

Accel Model Name: Intel Xeon E5-2697 v4  
 Accel Vendor: Intel  
 Accel Name: Intel Xeon E5-2697 v4  
 Type of Accel: CPU  
 Accel Connection: N/A  
 Does Accel Use ECC: yes  
 Accel Description: 2x Intel Xeon E5-2697 v4 CPUs with Hyper-Threading  
 Accel Driver: N/A



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## Hardware (Continued)

Memory: 128 GB (8 x 16 GB 2Rx4 PC4-2400U-R)  
Disk Subsystem: Panasas File System  
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 17.0.3.191 of Intel  
Composer XE for Linux Build 20170404  
File System: panfs  
System State: 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	74.0	1.47	71.3	1.53	<b>72.0</b>	<b>1.51</b>	74.0	1.47	71.3	1.53	<b>72.0</b>	<b>1.51</b>
504.polbm	<b>52.7</b>	<b>2.31</b>	51.8	2.35	53.4	2.29	<b>45.9</b>	<b>2.66</b>	45.6	2.68	45.9	2.66
514.pomriq	363	1.71	309	2.01	<b>310</b>	<b>2.01</b>	363	1.71	309	2.01	<b>310</b>	<b>2.01</b>
550.pmd	92.6	2.60	93.1	2.59	<b>92.8</b>	<b>2.60</b>	<b>85.0</b>	<b>2.84</b>	84.6	2.85	85.1	2.83
551.ppalm	232	2.34	<b>230</b>	<b>2.36</b>	228	2.39	<b>107</b>	<b>5.09</b>	105	5.16	107	5.08
552.pep	94.1	2.46	94.4	2.45	<b>94.3</b>	<b>2.45</b>	<b>87.8</b>	<b>2.63</b>	87.9	2.63	86.3	2.68
553.pclvrleaf	257	4.45	<b>257</b>	<b>4.46</b>	256	4.47	257	4.45	<b>257</b>	<b>4.46</b>	256	4.47
554.pcg	<b>61.9</b>	<b>5.38</b>	61.6	5.41	62.1	5.37	<b>60.0</b>	<b>5.55</b>	59.6	5.58	60.1	5.55
555.pseismic	133	2.13	130	2.17	<b>131</b>	<b>2.16</b>	133	2.13	130	2.17	<b>131</b>	<b>2.16</b>
556.psp	<b>81.5</b>	<b>10.0</b>	85.3	9.59	80.3	10.2	<b>81.5</b>	<b>10.0</b>	85.3	9.59	80.3	10.2
557.pcsp	83.4	10.3	<b>83.0</b>	<b>10.4</b>	82.5	10.4	83.4	10.3	<b>83.0</b>	<b>10.4</b>	82.5	10.4
559.pmniGhost	<b>126</b>	<b>3.14</b>	126	3.14	125	3.17	<b>126</b>	<b>3.14</b>	126	3.14	125	3.17
560.pilbdc	268	2.44	264	2.47	<b>265</b>	<b>2.46</b>	268	2.44	264	2.47	<b>265</b>	<b>2.46</b>
563.pswim	76.4	2.08	74.8	2.13	<b>75.2</b>	<b>2.11</b>	76.4	2.08	74.8	2.13	<b>75.2</b>	<b>2.11</b>
570.pbt	52.4	14.9	51.1	15.3	<b>51.1</b>	<b>15.3</b>	52.4	14.9	51.1	15.3	<b>51.1</b>	<b>15.3</b>

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.  
submit = LD\_PRELOAD=/opt/intel/compiler/2017u3/tbb/lib/intel64/gcc4.7/libtbbmalloc\_proxy.so.2 \$command  
used Intel(R) TBB malloc



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## Intel

## Intel Xeon E5-2697 v4

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### Platform Notes

Sysinfo program

/panfs/projects/innl/abobyr/SpecACCEL\_OMP/kits/kit75\_bdw/Docs/sysinfo

\$Rev: 6965 \$ \$Date:: 2015-04-21 #\$ c05a7f14b1b1765e3fe1df68447e8a35

running on ebwnv03 Tue May 16 07:51:38 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(R) CPU E5-2697 v4 @ 2.30GHz

2 "physical id"s (chips)

72 "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 : 18

siblings : 36

physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

cache size : 46080 KB

From /proc/meminfo

MemTotal: 131915832 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

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

uname -a:

Linux ebwnv03 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 May 15 15:09

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## Platform Notes (Continued)

SPEC is set to: /panfs/projects/innl/abobyr/SpecACCEL\_OMP/kits/kit75\_bdw  
Filesystem Type Size Used Avail Use% Mounted on  
panfs://36.101.211.31/ panfs 251T 69T 182T 28% /global/panfs01  
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=72 - limits number of Threads to be started to 72  
ENV\_KMP\_HW\_SUBSET=2S,18C,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  
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

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## Base 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
```

## Base Optimization Flags

C benchmarks:

```
-O3 -xCORE-AVX2 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/
```

Fortran benchmarks:

```
-O3 -xCORE-AVX2 -qopenmp -qopenmp-offload=host
-fimf-precision=low:sqrt,exp,log,/
```

Benchmarks using both Fortran and C:

```
-O3 -xCORE-AVX2 -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
```

## 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
```

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## Peak Portability Flags (Continued)

```

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 -xCORE-AVX2 -qopenmp -qopenmp-offload=host  
-fimf-precision=low:sqrt,exp,log, /

514.pomriq: basepeak = yes

552.pep: -O3 -xCORE-AVX2 -qopenmp -qopenmp-offload=host  
-fimf-precision=low:sqrt,exp,log, /  
-qopt-streaming-stores always

554.pcg: -O3 -xCORE-AVX2 -qopenmp -qopenmp-offload=host  
-fimf-precision=low:sqrt,exp,log, / -qopt-prefetch=5

557.pcsp: basepeak = yes

570.pbt: basepeak = yes

Fortran benchmarks:

550.pmd: -O3 -xCORE-AVX2 -qopenmp -qopenmp-offload=host  
-fimf-precision=low:sqrt,exp,log, / -qopt-prefetch=2

551.ppalm: -O3 -xCORE-AVX2 -qopenmp -qopenmp-offload=host  
-fimf-precision=low:sqrt,exp,log, /  
-I/home/aboby/FFTW-3.3.6/include  
-L/home/aboby/FFTW-3.3.6/lib

555.pseismic: basepeak = yes

556.psp: basepeak = yes

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## Peak Optimization Flags (Continued)

560.pilbdc: basepeak = yes

563.pswim: basepeak = yes

Benchmarks using both Fortran and C:

553.pclvrleaf: basepeak = yes

559.pmniGhost: basepeak = yes

## 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-icc17.0-linux64.html>

You can also download the XML flags source by saving the following link:

<https://www.spec.org/accel/flags/Intel-icc17.0-linux64.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).

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