# SPEC® OMPG2012 Result

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## Intel

(Test Sponsor: Technische Universitaet Dresden)

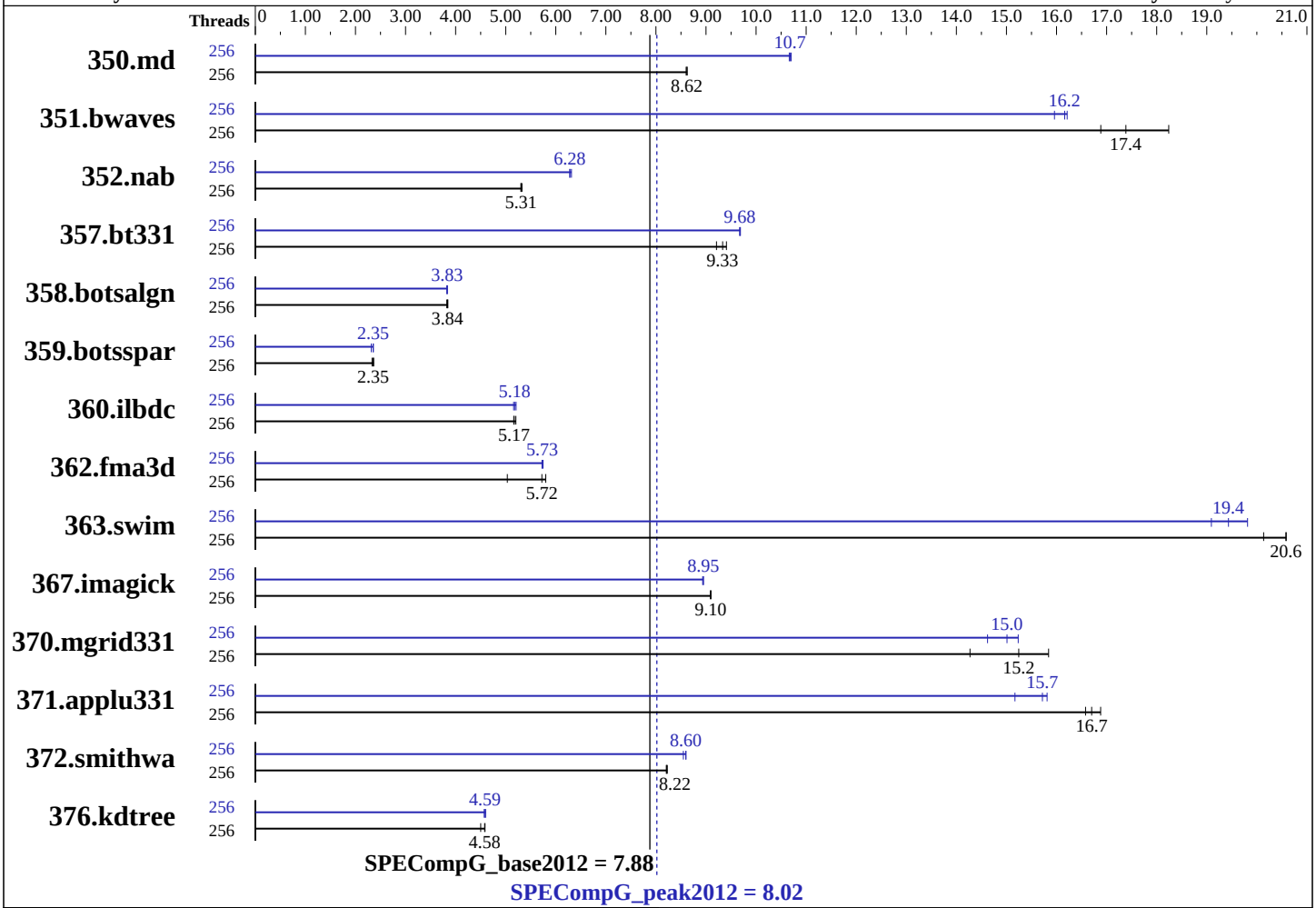
Intel Server System LADMP00AP Family (Xeon Phi 7210, 1.3 GHz, SMT on, Turbo on, MCDRAM Cache)

**SPECompG_peak2012 = 8.02**

**SPECompG_base2012 = 7.88**

**OMP2012 license:** 37A
**Test sponsor:** Technische Universitaet Dresden
**Tested by:** Technische Universitaet Dresden

**Test date:** Aug-2017
**Hardware Availability:** Jun-2016
**Software Availability:** May-2017




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon Phi 7210 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 1.5 GHz |
| CPU MHz: | 1300 |
| CPU MHz Maximum: | 1500 |
| FPU: | Integrated |
| CPU(s) enabled: | 64 cores, 1 chip, 64 cores/chip, 4 threads/core |
| CPU(s) orderable: | 1 chip |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 1 MB I+D on chip per two cores |
| L3 Cache: | None |
| Other Cache: | None |
| Memory: | 96 GB (6 x 16 GB 2Rx4 PC4-2400T-R) |
| Disk Subsystem: | 275 GB INTEL SSDSC2BB30 |
| Other Hardware: | None |
| Base Threads Run: | 256 |
| Minimum Peak Threads: | 256 |

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## Software

| | |
|---|---|
| Operating System: | CentOS Linux release 7.3<br>Kernel 3.0.76-0.11-default |
| Compiler: | C/C++/Fortran: Version 17.0.0.4 of Intel Composer XE for Linux Build 20170411 |
| Auto Parallel: | No |
| File System: | ext4 |
| System State: | Default |
| Base Pointers: | 64-bit |
| Peak Pointers: | 64-bit |
| Other Software: | None |

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**Test date:** Aug-2017

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**Software Availability:** May-2017

Maximum Peak Threads: 256

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 350.md | 256 | 538 | 8.60 | **537** | **8.62** | 537 | 8.62 | 256 | **434** | **10.7** | 433 | 10.7 | 434 | 10.7 |
| 351.bwaves | 256 | **261** | **17.4** | 248 | 18.2 | 268 | 16.9 | 256 | 279 | 16.2 | **280** | **16.2** | 284 | 16.0 |
| 352.nab | 256 | **733** | **5.31** | 731 | 5.33 | 733 | 5.31 | 256 | **619** | **6.28** | 619 | 6.28 | 616 | 6.31 |
| 357.bt331 | 256 | 504 | 9.41 | 515 | 9.21 | **508** | **9.33** | 256 | 490 | 9.67 | 489 | 9.69 | **490** | **9.68** |
| 358.botsalgn | 256 | 1138 | 3.82 | 1131 | 3.85 | **1133** | **3.84** | 256 | 1134 | 3.84 | 1138 | 3.82 | **1136** | **3.83** |
| 359.botsspar | 256 | 2253 | 2.33 | 2220 | 2.36 | **2232** | **2.35** | 256 | **2232** | **2.35** | 2227 | 2.36 | 2268 | 2.31 |
| 360.ilbdc | 256 | 684 | 5.20 | 690 | 5.16 | **689** | **5.17** | 256 | 690 | 5.16 | **687** | **5.18** | 684 | 5.21 |
| 362.fma3d | 256 | **664** | **5.72** | 755 | 5.03 | 655 | 5.80 | 256 | 664 | 5.72 | **663** | **5.73** | 661 | 5.75 |
| 363.swim | 256 | 220 | 20.6 | **220** | **20.6** | 225 | 20.1 | 256 | 229 | 19.8 | 237 | 19.1 | **233** | **19.4** |
| 367.imagick | 256 | 774 | 9.09 | **773** | **9.10** | 773 | 9.10 | 256 | 786 | 8.95 | 787 | 8.93 | **786** | **8.95** |
| 370.mgrid331 | 256 | 279 | 15.8 | **290** | **15.2** | 310 | 14.3 | 256 | 290 | 15.2 | 302 | 14.6 | **294** | **15.0** |
| 371.applu331 | 256 | 359 | 16.9 | **363** | **16.7** | 366 | 16.6 | 256 | 399 | 15.2 | **386** | **15.7** | 383 | 15.8 |
| 372.smithwa | 256 | 653 | 8.21 | 651 | 8.23 | **652** | **8.22** | 256 | 627 | 8.55 | 623 | 8.60 | **624** | **8.60** |
| 376.kdtree | 256 | **983** | **4.58** | 1000 | 4.50 | 981 | 4.59 | 256 | 978 | 4.60 | 985 | 4.57 | **981** | **4.59** |

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

## Platform Notes

```
Sysinfo program /tmp/spec/1.1/Docs/sysinfo
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)
running on taurusknl27.taurus.hrsk.tu-dresden.de Sat Aug 19 13:24:41 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/omp2012/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon Phi(TM) CPU 7210 @ 1.30GHz
      1 "physical id"s (chips)
      256 "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 : 64
      siblings  : 256
      physical 0: cores 0 1 2 3 6 7 10 11 12 13 14 15 18 19 20 21 22 23 24 25 26
      27 28 29 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 68 69 70 71 72 73
   cache size : 1024 KB

From /proc/meminfo
```

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## Platform Notes (Continued)

```
      MemTotal:       98707216 kB
      HugePages_Total:       0
      Hugepagesize:       2048 kB

   /usr/bin/lsb_release -d
      CentOS Linux release 7.3.1611 (Core)

   From /etc/*release* /etc/*version*
      centos-release: CentOS Linux release 7.3.1611 (Core)
      centos-release-upstream: Derived from Red Hat Enterprise Linux 7.3 (Source)
      os-release:
         NAME="CentOS Linux"
         VERSION="7 (Core)"
         ID="centos"
         ID_LIKE="rhel fedora"
         VERSION_ID="7"
         PRETTY_NAME="CentOS Linux 7 (Core)"
         ANSI_COLOR="0;31"
         CPE_NAME="cpe:/o:centos:centos:7"
      redhat-release: CentOS Linux release 7.3.1611 (Core)
      system-release: CentOS Linux release 7.3.1611 (Core)
      system-release-cpe: cpe:/o:centos:centos:7

   uname -a:
      Linux taurusknl27.taurus.hrsk.tu-dresden.de 3.10.0-514.21.2.el7.x86_64 #1 SMP
      Tue Jun 20 12:24:47 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 Jun 30 13:46

   SPEC is set to: /tmp/spec/1.1
      Filesystem     Type  Size  Used Avail Use% Mounted on
      /dev/sda1      ext4  275G  4.7G  257G   2% /
   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

```
 System settings:
  Execute Disable Bit=Enabled
  L1 + L2 Prefetcher=Enabled
  SRAT Ordering by Domain Precedence=Enabled
  CPU Power and Performance Policy=Balanced Performance
  CPU C-State=Enabled
  C1E Autopromote=Enabled
```

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## General Notes (Continued)

```
 Processor C6=Enabled
 Enhanced Intel SpeedStep(R) Tech=Enabled
 Intel(R) Turbo Boost Technology=Enabled
 Cluster Mode=Quadrant
 Data Scrambling=Auto
 Rank Margin Tool=Auto
Environment variables:
 ENV_KMP_AFFINITY=compact,0
 ENV_KMP_LIBRARY=turnaround
 ENV_KMP_BLOCKTIME=infinite
 ENV_KMP_STACKSIZE=190M
 ENV_OMP_DYNAMIC=FALSE
 ENV_OMP_NESTED=FALSE
```

## Base Compiler Invocation

C benchmarks:
`icc`

C++ benchmarks:
`icpc`

Fortran benchmarks:
`ifort`

## Base Portability Flags

350.md: `-FR`
357.bt331: `-mcmodel=medium`
363.swim: `-mcmodel=medium`
367.imagick: `-std=c99`

## Base Optimization Flags

C benchmarks:
`-O3 -openmp -ipo -xMIC-AVX512 -ansi-alias`

C++ benchmarks:
`-O3 -openmp -ipo -xMIC-AVX512 -ansi-alias`

Fortran benchmarks:
`-O3 -openmp -ipo -xMIC-AVX512 -align array64byte`

## Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

## Peak Portability Flags

350.md: -FR
357.bt331: -mcmodel=medium
363.swim: -mcmodel=medium
367.imagick: -std=c99

## Peak Optimization Flags

C benchmarks:

352.nab: -O3 -openmp -ipo -xMIC-AVX512 -fno-alias -opt-malloc-options=1 -opt-calloc -fp-model fast=2 -no-prec-div -no-prec-sqrt -ansi-alias

358.botsalgn: -O3 -openmp -ipo -xMIC-AVX512 -fno-alias -ansi-alias

359.botsspar: Same as 358.botsalgn

367.imagick: -O2 -openmp -ipo -xMIC-AVX512 -ansi-alias

372.smithwa: -O2 -openmp -ipo -xMIC-AVX512 -fno-alias -opt-streaming-stores always -opt-malloc-options=1 -ansi-alias

C++ benchmarks:
-O3 -openmp -ipo -xMIC-AVX512 -fno-alias -ansi-alias

Fortran benchmarks:

350.md: -O2 -openmp -ipo -xMIC-AVX512 -fno-alias -opt-malloc-options=1 -fp-model fast=2 -no-prec-div -no-prec-sqrt -align array64byte

351.bwaves: -O3 -openmp -ipo -xMIC-AVX512 -fno-alias -fp-model fast=2 -no-prec-div -no-prec-sqrt -align array64byte

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## Peak Optimization Flags (Continued)

357.bt331: Same as 351.bwaves

360.ilbdc: -O3 -openmp -ipo -xMIC-AVX512 -opt-malloc-options=1 -align array64byte

362.fma3d: -O3 -openmp -ipo -xMIC-AVX512 -fno-alias -align array64byte

363.swim: -O3 -openmp -ipo -xMIC-AVX512 -fno-alias -opt-streaming-stores always -opt-malloc-options=3 -align array64byte

370.mgrid331: -O2 -openmp -ipo -xMIC-AVX512 -fno-alias -opt-malloc-options=3 -align array64byte

371.applu331: -O2 -openmp -ipo -xAVX -align array64byte

The flags file that was used to format this result can be browsed at
http://www.spec.org/omp2012/flags/icc2018-openmp.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/omp2012/flags/icc2018-openmp.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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