# SPEC® CINT2006 Result



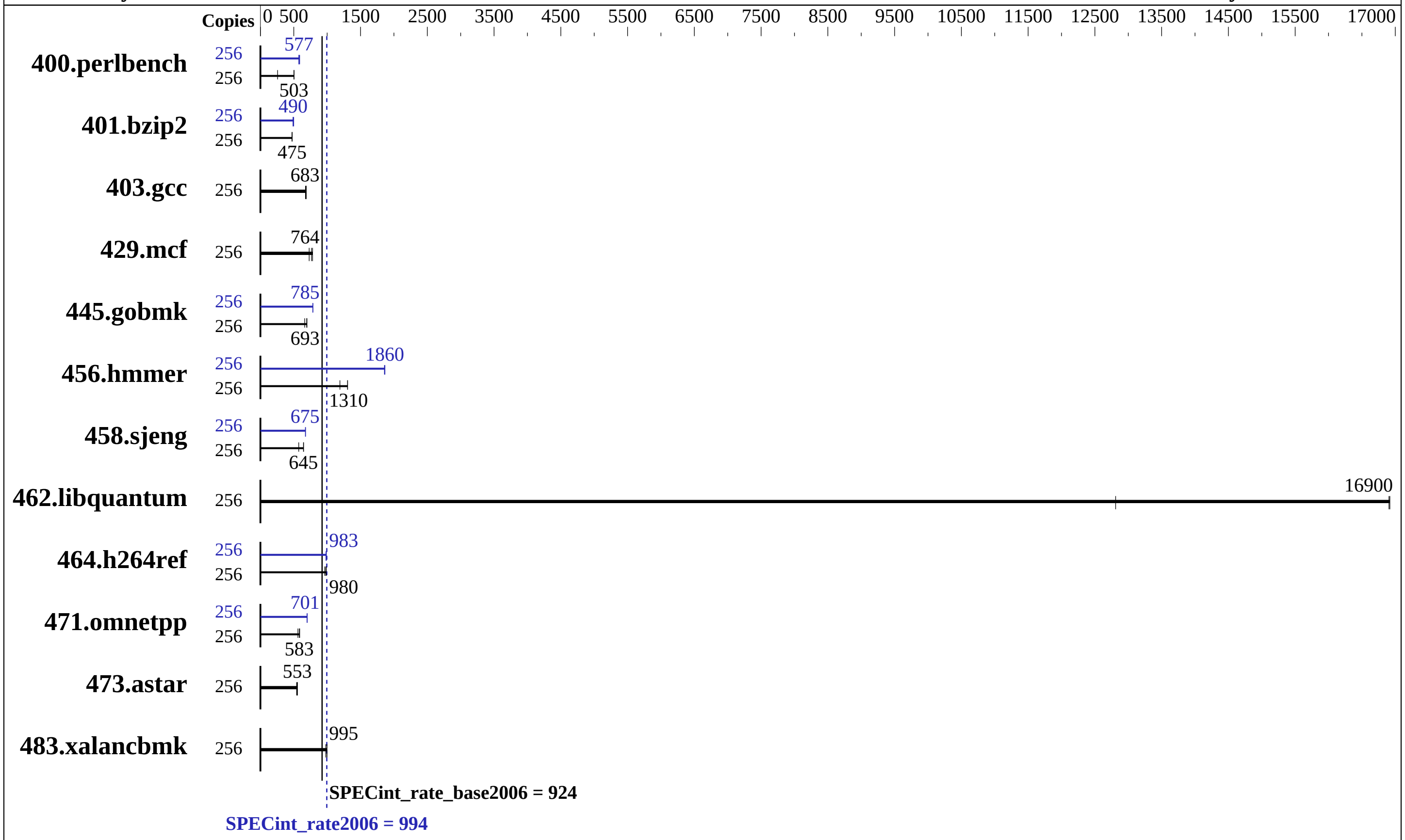
## Dell Inc.

PowerEdge C6320p (Intel Xeon Phi 7230 1.30 GHz)

SPECint®_rate2006 = 994

SPECint_rate_base2006 = 924

| | | | |
|---|---|---|---|
| **CPU2006 license:** | 55 | **Test date:** | Mar-2017 |
| **Test sponsor:** | Dell Inc. | **Hardware Availability:** | Jan-2017 |
| **Tested by:** | Dell Inc. | **Software Availability:** | Jan-2017 |




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon Phi 7230 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 1.50 GHz |
| CPU MHz: | 1300 |
| 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: | 400 GB (6 x 64 GB 2Rx8 PC4-2400T-R + 8 x 2 GB 7200 MHz MCDRAM) |
| Disk Subsystem: | 1 x 1 TB 7.2K RPM SATA |
| Other Hardware: | None |

## Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.16-56-default |
| Compiler: | C/C++: Version 16.0.2.181 of Intel C++ Studio XE for Linux |
| Auto Parallel: | No |
| File System: | btrfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 32-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | Microquill SmartHeap V10.2 |

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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 256 | 4970 | 503 | 9716 | 257 | **4972** | **503** | 256 | 4339 | 576 | **4334** | **577** | 4253 | 588 |
| 401.bzip2 | 256 | **5198** | **475** | 5197 | 475 | 5205 | 475 | 256 | 5048 | 489 | **5047** | **490** | 4951 | 499 |
| 403.gcc | 256 | **3016** | **683** | 3053 | 675 | 3003 | 686 | 256 | **3016** | **683** | 3053 | 675 | 3003 | 686 |
| 429.mcf | 256 | 3196 | 730 | **3054** | **764** | 2986 | 782 | 256 | 3196 | 730 | **3054** | **764** | 2986 | 782 |
| 445.gobmk | 256 | 4048 | 663 | 3851 | 697 | **3875** | **693** | 256 | 3418 | 786 | **3422** | **785** | 3423 | 784 |
| 456.hmmer | 256 | 2006 | 1190 | **1830** | **1310** | 1828 | 1310 | 256 | **1282** | **1860** | 1286 | 1860 | 1280 | 1870 |
| 458.sjeng | 256 | 5397 | 574 | 4790 | 647 | **4805** | **645** | 256 | 4595 | 674 | 4591 | 675 | **4591** | **675** |
| 462.libquantum | 256 | 414 | 12800 | **314** | **16900** | 314 | 16900 | 256 | 414 | 12800 | **314** | **16900** | 314 | 16900 |
| 464.h264ref | 256 | 5879 | 964 | 5744 | 986 | **5783** | **980** | 256 | 5729 | 989 | **5762** | **983** | 5763 | 983 |
| 471.omnetpp | 256 | 2849 | 562 | 2719 | 588 | **2746** | **583** | 256 | 2286 | 700 | **2284** | **701** | 2284 | 701 |
| 473.astar | 256 | 3312 | 543 | **3249** | **553** | 3245 | 554 | 256 | 3312 | 543 | **3249** | **553** | 3245 | 554 |
| 483.xalancbmk | 256 | 1804 | 979 | **1774** | **995** | 1773 | 996 | 256 | 1804 | 979 | **1774** | **995** | 1773 | 996 |

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

## Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

## Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

## Platform Notes

```
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-z6tq Wed Mar 15 16:01:43 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/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Genuine Intel(R) CPU 0000 @ 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
```

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## Platform Notes (Continued)

```
        physical 0: cores 0 1 8 9 12 13 14 15 18 19 20 21 22 23 24 25 26 27 28 29
        30 31 34 35 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 56 57 60 61 62
        63 64 65 66 67 68 69 70 71 72 73 74 75
     cache size : 1024 KB

  From /proc/meminfo
     MemTotal:       396136360 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  From /etc/*release* /etc/*version*
     SuSE-release:
        SUSE Linux Enterprise Server 12 (x86_64)
        VERSION = 12
        PATCHLEVEL = 2
        # This file is deprecated and will be removed in a future service pack or
        release.
        # Please check /etc/os-release for details about this release.
     os-release:
        NAME="SLES"
        VERSION="12-SP2"
        VERSION_ID="12.2"
        PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
        ID="sles"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12:sp2"

  uname -a:
     Linux linux-z6tq 4.4.16-56-default #1 SMP Mon Aug 8 14:24:26 UTC 2016
     (5b281a8) x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Mar 15 15:59

  SPEC is set to: /root/cpu2006-1.2
     Filesystem     Type   Size  Used Avail Use% Mounted on
     /dev/sdb2      btrfs  930G  533G  395G  58% /
  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.

    BIOS Dell Inc. 1.1.7 003/003/2017
    Memory:
     6x Hynix HMAA8GL7MMR4N-UH 64 GB 4 rank 2400 MHz
     8x INTEL N/A 2 GB 7200 MHz

  (End of data from sysinfo program)
```

## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

 Binaries compiled on a system with
 Intel 2nd Generation Xeon Phi CPU
 with 96 GB DDR4 memory using RedHat EL 7.2
 Filesystem page cache cleared with:
 echo 1>       /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

## Base Compiler Invocation

C benchmarks:
`icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

C++ benchmarks:
`icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

## Base Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
401.bzip2: -D_FILE_OFFSET_BITS=64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -D_FILE_OFFSET_BITS=64
458.sjeng: -D_FILE_OFFSET_BITS=64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

## Base Optimization Flags

C benchmarks:
`-xMIC-AVX512 -ipo -O3 -no-prec-div -opt-prefetch`

C++ benchmarks:
`-xMIC-AVX512 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs -L/sh -lsmartheap`

## Base Other Flags

C benchmarks:

403.gcc: `-Dalloca=_alloca`

## Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

C++ benchmarks:
`icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

## Peak Portability Flags

400.perlbench: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64`
403.gcc: `-D_FILE_OFFSET_BITS=64`
429.mcf: `-D_FILE_OFFSET_BITS=64`
445.gobmk: `-D_FILE_OFFSET_BITS=64`
456.hmmer: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64`
458.sjeng: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64`
462.libquantum: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`
464.h264ref: `-D_FILE_OFFSET_BITS=64`
471.omnetpp: `-D_FILE_OFFSET_BITS=64`
473.astar: `-D_FILE_OFFSET_BITS=64`
483.xalancbmk: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`

## Peak Optimization Flags

C benchmarks:

400.perlbench: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-prof-use`(pass 2) `-par-num-threads=1`(pass 1) `-auto-ilp32`

401.bzip2: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-prof-use`(pass 2) `-par-num-threads=1`(pass 1) `-opt-prefetch -auto-ilp32 -ansi-alias`

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## Peak Optimization Flags (Continued)

403.gcc: basepeak = yes

429.mcf: basepeak = yes

445.gobmk: -xMIC-AVX512(pass 2) -prof-gen(pass 1) -par-num-threads=1(pass 1) -prof-use(pass 2) -ansi-alias

456.hmmer: -xMIC-AVX512 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen(pass 1) -prof-use(pass 2) -par-num-threads=1(pass 1) -unroll4 -auto-ilp32

462.libquantum: basepeak = yes

464.h264ref: -xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen(pass 1) -prof-use(pass 2) -par-num-threads=1(pass 1) -unroll2 -ansi-alias

C++ benchmarks:

471.omnetpp: -xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen(pass 1) -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs -L/sh -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

## Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64-revB.html
http://www.spec.org/cpu2006/flags/Default-Platform-Flags.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64-revB.xml
http://www.spec.org/cpu2006/flags/Default-Platform-Flags.xml

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

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