



# SPEC® CFP2006 Result

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## Quanta Computer Inc.

SPECfp®2006 = **117**

QuantaGrid D51PH-1ULH (Intel Xeon E5-2698 v3)

SPECfp\_base2006 = **111**

CPU2006 license: 9050

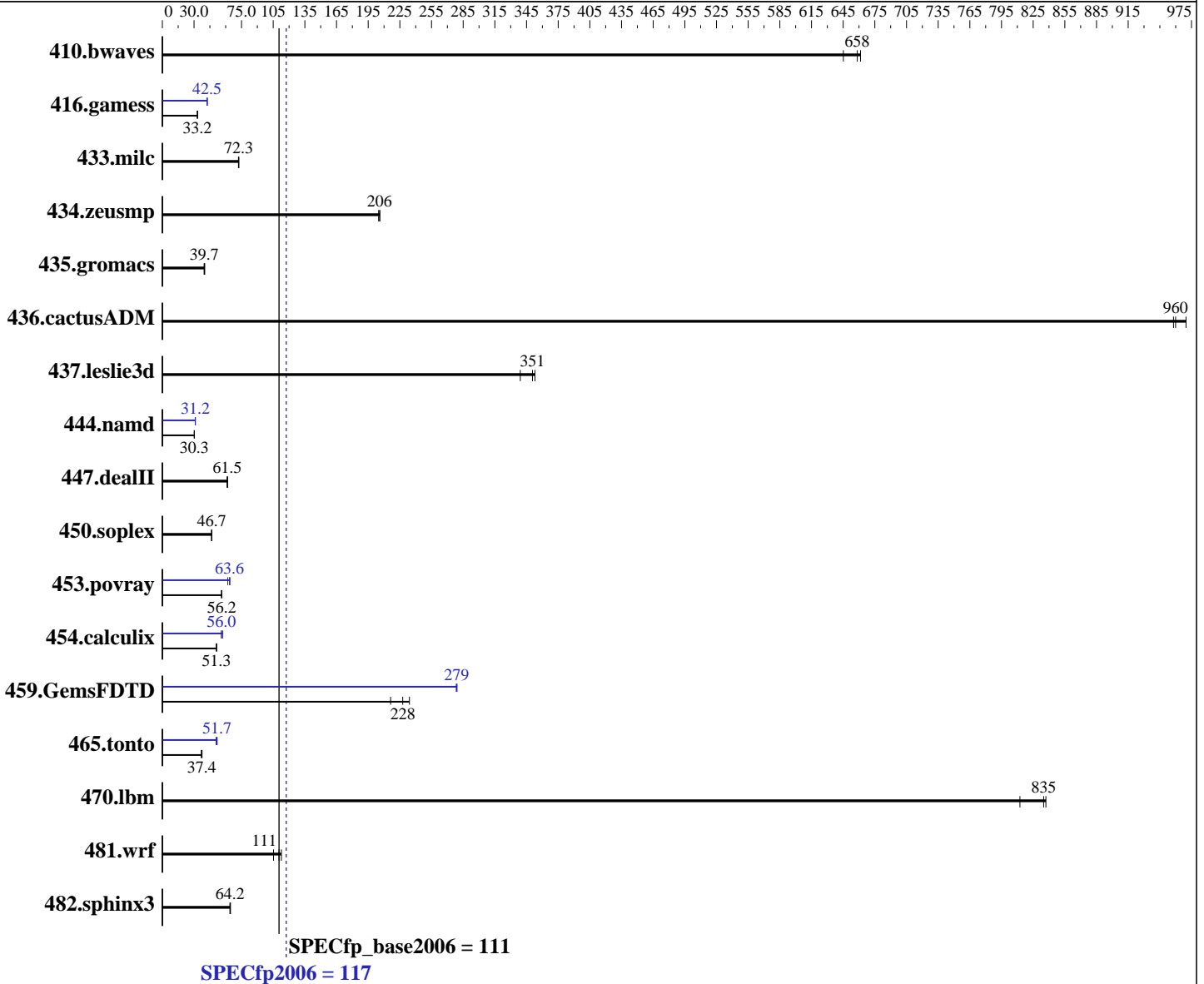
Test date: Mar-2016

Test sponsor: Quanta Computer Inc.

Hardware Availability: Oct-2015

Tested by: Quanta Computer Inc.

Software Availability: Oct-2015



### Hardware

CPU Name: Intel Xeon E5-2698 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 2 chips, 16 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 chip  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

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### Software

Operating System: Red Hat Enterprise Linux Server release 7.1 (Maipo)  
 3.10.0-229.el7.x86\_64  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: xfs

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L3 Cache: 40 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 128 GB (8 x 16 GB 2Rx4 PC4-2133P-R)  
 Disk Subsystem: 1 x 440 GB SATA SSD  
 Other Hardware: None

System State: Run level 5 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	21.1	645	20.5	661	<b><u>20.6</u></b>	<b><u>658</u></b>	21.1	645	20.5	661	<b><u>20.6</u></b>	<b><u>658</u></b>
416.gamess	587	33.3	<b><u>589</u></b>	<b><u>33.2</u></b>	591	33.1	<b><u>461</u></b>	<b><u>42.5</u></b>	461	42.5	461	42.4
433.milc	<b><u>127</u></b>	<b><u>72.3</u></b>	127	72.5	127	72.1	<b><u>127</u></b>	<b><u>72.3</u></b>	127	72.5	127	72.1
434.zeusmp	44.2	206	<b><u>44.2</u></b>	<b><u>206</u></b>	44.4	205	44.2	206	<b><u>44.2</u></b>	<b><u>206</u></b>	44.4	205
435.gromacs	178	40.2	180	39.7	<b><u>180</u></b>	<b><u>39.7</u></b>	178	40.2	180	39.7	<b><u>180</u></b>	<b><u>39.7</u></b>
436.cactusADM	<b><u>12.4</u></b>	<b><u>960</u></b>	12.5	958	12.3	970	<b><u>12.4</u></b>	<b><u>960</u></b>	12.5	958	12.3	970
437.leslie3d	26.6	353	27.7	339	<b><u>26.8</u></b>	<b><u>351</u></b>	26.6	353	27.7	339	<b><u>26.8</u></b>	<b><u>351</u></b>
444.namd	<b><u>265</u></b>	<b><u>30.3</u></b>	265	30.3	266	30.2	257	31.2	<b><u>257</u></b>	<b><u>31.2</u></b>	257	31.2
447.dealII	186	61.5	185	61.8	<b><u>186</u></b>	<b><u>61.5</u></b>	186	61.5	185	61.8	<b><u>186</u></b>	<b><u>61.5</u></b>
450.soplex	178	46.8	<b><u>179</u></b>	<b><u>46.7</u></b>	179	46.7	178	46.8	<b><u>179</u></b>	<b><u>46.7</u></b>	179	46.7
453.povray	95.0	56.0	<b><u>94.7</u></b>	<b><u>56.2</u></b>	94.5	56.3	83.1	64.0	<b><u>83.7</u></b>	<b><u>63.6</u></b>	85.9	61.9
454.calculix	161	51.3	<b><u>161</u></b>	<b><u>51.3</u></b>	161	51.3	<b><u>147</u></b>	<b><u>56.0</u></b>	144	57.3	148	55.9
459.GemsFDTD	45.3	234	49.1	216	<b><u>46.6</u></b>	<b><u>228</u></b>	38.0	279	<b><u>38.0</u></b>	<b><u>279</u></b>	38.1	278
465.tonto	<b><u>263</u></b>	<b><u>37.4</u></b>	267	36.9	262	37.6	193	50.9	<b><u>190</u></b>	<b><u>51.7</u></b>	190	51.9
470.lbm	16.9	812	16.4	837	<b><u>16.5</u></b>	<b><u>835</u></b>	16.9	812	16.4	837	<b><u>16.5</u></b>	<b><u>835</u></b>
481.wrf	<b><u>101</u></b>	<b><u>111</u></b>	99.1	113	106	105	<b><u>101</u></b>	<b><u>111</u></b>	99.1	113	106	105
482.sphinx3	302	64.5	305	64.0	<b><u>303</u></b>	<b><u>64.2</u></b>	302	64.5	305	64.0	<b><u>303</u></b>	<b><u>64.2</u></b>

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

## Operating System Notes

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

## Platform Notes

BIOS Settings:  
 Snoop Mode: COD  
 BMC Settings:  
 Fan Mode: Full Speed  
 Sysinfo program /home/speccpu/Desktop/cpu2006-1.2/config/sysinfo.rev6914  
 \$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
 running on localhost.localdomain Fri Mar 18 21:54:25 2016

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

Continued on next page



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## Platform Notes (Continued)

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From /proc/cpuinfo

```

model name : Intel(R) Xeon(R) CPU E5-2698 v3 @ 2.30GHz
 2 "physical id"s (chips)
 64 "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 : 16
  siblings  : 32
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
cache size : 40960 KB

```

From /proc/meminfo

```

MemTotal:      131752248 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

```

From /etc/\*release\* /etc/\*version\*

```

os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.1 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.1"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.1:ga:server

```

uname -a:

```

Linux localhost.localdomain 3.10.0-229.el7.x86_64 #1 SMP Thu Jan 29 18:37:38
EST 2015 x86_64 x86_64 x86_64 GNU/Linux

```

run-level 5 Mar 18 14:43

SPEC is set to: /home/speccpu/Desktop/cpu2006-1.2

```

Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sda2        xfs      440G  279G  162G  64% /

```

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 American Megatrends Inc. S2P\_3A03 12/26/2014

Memory:

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## Platform Notes (Continued)

8x NO DIMM NO DIMM

8x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz

(End of data from sysinfo program)

## General Notes

Environment variables set by runspec before the start of the run:

KMP\_AFFINITY = "granularity=fine,compact,1,0"

LD\_LIBRARY\_PATH = "/home/speccpu/Desktop/cpu2006-1.2/libs/32:/home/speccpu/Desktop/cpu2006-1.2/libs/64:/home/speccpu/Desktop/cpu2006-1.2/sh"

OMP\_NUM\_THREADS = "32"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/transparent\_hugepage/enabled

## Base Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## Base Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64  
 416.gamess: -DSPEC\_CPU\_LP64  
 433.milc: -DSPEC\_CPU\_LP64  
 434.zeusmp: -DSPEC\_CPU\_LP64  
 435.gromacs: -DSPEC\_CPU\_LP64 -nofor\_main  
 436.cactusADM: -DSPEC\_CPU\_LP64 -nofor\_main  
 437.leslie3d: -DSPEC\_CPU\_LP64  
 444.namd: -DSPEC\_CPU\_LP64  
 447.dealII: -DSPEC\_CPU\_LP64  
 450.soplex: -DSPEC\_CPU\_LP64  
 453.povray: -DSPEC\_CPU\_LP64  
 454.calculix: -DSPEC\_CPU\_LP64 -nofor\_main  
 459.GemsFDTD: -DSPEC\_CPU\_LP64

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## Base Portability Flags (Continued)

465.tonto: -DSPEC\_CPU\_LP64  
470.lbm: -DSPEC\_CPU\_LP64  
481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX  
482.sphinx3: -DSPEC\_CPU\_LP64

## Base Optimization Flags

C benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
-ansi-alias

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
-ansi-alias

## Peak Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## Peak Portability Flags

Same as Base Portability Flags



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## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias  
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4  
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2  
-inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc  
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

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## Peak Optimization Flags (Continued)

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes

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.html>

<http://www.spec.org/cpu2006/flags/Quanta-Computer-Inc-Platform-Settings-V1.1.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.xml>

<http://www.spec.org/cpu2006/flags/Quanta-Computer-Inc-Platform-Settings-V1.1.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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