# SPEC® CFP2006 Result

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## Gigabyte Technology Co., Ltd.

(Test Sponsor: Intel Corporation)

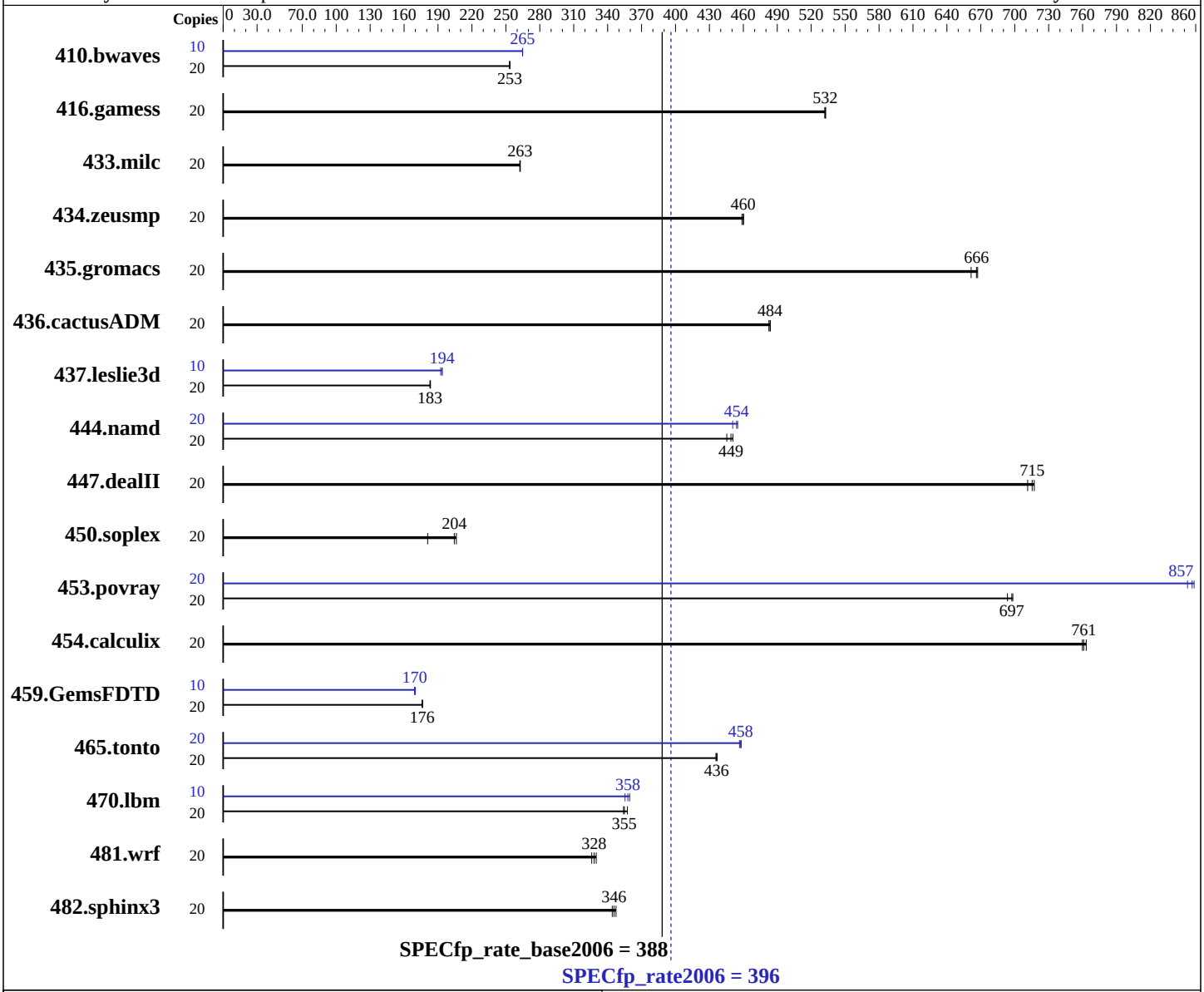
GigaByte GA-X99-Designare EX motherboard (Intel Core i7-6950X)

**SPECfp®_rate2006 = 396**

**SPECfp_rate_base2006 = 388**

**CPU2006 license:** 13
**Test sponsor:** Intel Corporation
**Tested by:** Intel Corporation

**Test date:** Jun-2016
**Hardware Availability:** May-2016
**Software Availability:** Nov-2015




## Hardware

| | |
|---|---|
| CPU Name: | Intel Core i7-6950X |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.50 GHz |
| CPU MHz: | 3000 |
| FPU: | Integrated |
| CPU(s) enabled: | 10 cores, 1 chip, 10 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1 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: | Microsoft Windows 10 Pro 10.0.10586 N/A Build 10586 |
| Compiler: | C/C++: Version 16.0.0.110 of Intel C++ Studio XE for Windows; Fortran: Version 16.0.0.110 of Intel Fortran Studio XE for Windows; Libraries: Version 18.00.30723 of Microsoft Visual Studio 2013 |
| Auto Parallel: | No |

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L3 Cache: 25 MB I+D on chip per chip
Other Cache: None
Memory: 32 GB (4 x 8 GB 2Rx4 PC4-2133R-U)
Disk Subsystem: 1 TB Seagate SATA HDD, 7200 RPM
Other Hardware: None

File System: NTFS
System State: Default
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: SmartHeap Library Version 11.0 from http://www.microquill.com/

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 20 | 1072 | 253 | **1073** | **253** | 1073 | 253 | 10 | 513 | 265 | 513 | 265 | **513** | **265** |
| 416.gamess | 20 | 736 | 532 | 735 | 533 | **736** | **532** | 20 | 736 | 532 | 735 | 533 | **736** | **532** |
| 433.milc | 20 | 700 | 262 | 699 | 263 | **699** | **263** | 20 | 700 | 262 | 699 | 263 | **699** | **263** |
| 434.zeusmp | 20 | **396** | **460** | 397 | 459 | 396 | 460 | 20 | **396** | **460** | 397 | 459 | 396 | 460 |
| 435.gromacs | 20 | 216 | 661 | 214 | 667 | **214** | **666** | 20 | 216 | 661 | 214 | 667 | **214** | **666** |
| 436.cactusADM | 20 | 495 | 483 | **494** | **484** | 494 | 484 | 20 | 495 | 483 | **494** | **484** | 494 | 484 |
| 437.leslie3d | 20 | 1028 | 183 | 1025 | 183 | **1027** | **183** | 10 | 489 | 192 | 485 | 194 | **485** | **194** |
| 444.namd | 20 | 360 | 445 | 356 | 451 | **357** | **449** | 20 | 356 | 451 | 353 | 455 | **353** | **454** |
| 447.dealII | 20 | 319 | 717 | **320** | **715** | 322 | 711 | 20 | 319 | 717 | **320** | **715** | 322 | 711 |
| 450.soplex | 20 | 922 | 181 | 809 | 206 | **816** | **204** | 20 | 922 | 181 | 809 | 206 | **816** | **204** |
| 453.povray | 20 | 152 | 698 | 153 | 694 | **153** | **697** | 20 | 125 | 853 | **124** | **857** | 124 | 859 |
| 454.calculix | 20 | **217** | **761** | 216 | 763 | 217 | 760 | 20 | **217** | **761** | 216 | 763 | 217 | 760 |
| 459.GemsFDTD | 20 | 1203 | 176 | **1206** | **176** | 1208 | 176 | 10 | 627 | 169 | 624 | 170 | **626** | **170** |
| 465.tonto | 20 | 452 | 436 | 451 | 437 | **451** | **436** | 20 | 431 | 457 | 430 | 458 | **430** | **458** |
| 470.lbm | 20 | **775** | **355** | 769 | 358 | 776 | 354 | 10 | 387 | 355 | **384** | **358** | 382 | 360 |
| 481.wrf | 20 | 677 | 330 | 685 | 326 | **681** | **328** | 20 | 677 | 330 | 685 | 326 | **681** | **328** |
| 482.sphinx3 | 20 | **1128** | **346** | 1122 | 347 | 1133 | 344 | 20 | **1128** | **346** | 1122 | 347 | 1133 | 344 |

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

## Compiler Invocation Notes

```
To compile these binaries, the Intel Compiler 16.0 was set up to
generate 64-bit binaries with the command:
"psxevars.bat intel64" (shortcut provided in the Intel(r)
Parallel Studio XE 2016 program folder)
```

## Submit Notes

```
Processes were bound to specific processors using the start command with the /affinity switch.
The config file option 'submit' was used to generate the affinity mask for each process.
```

## Platform Notes

```
Sysinfo program C:\SPEC16.0/Docs/sysinfo
$Rev: 6775 $ $Date:: 2011-08-16 #$ \8787f7622badcf24e01c368b1db4377c
running on Clt1C1B0D05C2E5 Sun Jun 19 00:13:30 2016

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

Trying 'systeminfo'
OS Name       : Microsoft Windows 10 Pro
OS Version    : 10.0.10586 N/A Build 10586
System Manufacturer: Gigabyte Technology Co., Ltd.
System Model  : Default string
Processor(s)  : 1 Processor(s) Installed.
     [01]: Intel64 Family 6 Model 79 Stepping 1 GenuineIntel ~3001 Mhz
BIOS Version  : American Megatrends Inc. F2, 5/22/2016
Total Physical Memory: 32,606 MB

Trying 'wmic cpu get /value'
DeviceID      : CPU0
L2CacheSize   : 2560
L3CacheSize   : 25600
MaxClockSpeed : 3001
Name          : Intel(R) Core(TM) i7-6950X CPU @ 3.00GHz
NumberOfCores : 10
NumberOfLogicalProcessors: 20

(End of data from sysinfo program)
```

## Component Notes

```
Tested systems can be used with Shin-G ATX case,
PC Power and Cooling 1200W power supply
```

## General Notes

```
450.soplex (base): "getline_test" src.alt was used.

447.dealII (base): "max_prototype" src.alt was used.
447.dealII (base): "cxx11_make_pair" src.alt was used.

450.soplex (base): "getline_test" src.alt was used.

447.dealII (base): "max_prototype" src.alt was used.
447.dealII (base): "cxx11_make_pair" src.alt was used.

 Binaries compiled on a system with 1x Intel Xeon E5-2699 v3 CPU
 + 64GB memory using Windows 8.1 Enterprise 64-bit
```

## Base Compiler Invocation

C benchmarks:
```
icl -Qvc12 -Qstd=c99
```

C++ benchmarks:
```
icl -Qvc12
```

Fortran benchmarks:
```
ifort
```

Benchmarks using both Fortran and C:
```
icl -Qvc12 -Qstd=c99 ifort
```

## Base Portability Flags

```
    410.bwaves: -DSPEC_CPU_P64
    416.gamess: -DSPEC_CPU_P64
      433.milc: -DSPEC_CPU_P64
    434.zeusmp: -DSPEC_CPU_P64
    435.gromacs: -DSPEC_CPU_P64
436.cactusADM: -DSPEC_CPU_P64 /names:lowercase /assume:underscore
    437.leslie3d: -DSPEC_CPU_P64
      444.namd: -DSPEC_CPU_P64 /TP
     447.dealII: -DSPEC_CPU_P64 -DDEAL_II_MEMBER_VAR_SPECIALIZATION_BUG
                 -DSPEC_CPU_BOOST_CONFIG_MSC_VER -DSPEC_NEED_ALGORITHM
     450.soplex: -DSPEC_CPU_P64 -DSPEC_GETLINE_TEST
     453.povray: -DSPEC_CPU_P64
    454.calculix: -DSPEC_CPU_P64 -DSPEC_CPU_NOZMODIFIER /names:lowercase
459.GemsFDTD: -DSPEC_CPU_P64
      465.tonto: -DSPEC_CPU_P64
       470.lbm: -DSPEC_CPU_P64
       481.wrf: -DSPEC_CPU_P64 -DSPEC_CPU_WINDOWS_ICL
    482.sphinx3: -DSPEC_CPU_P64
```

## Base Optimization Flags

C benchmarks:
```
-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qansi-alias -Qopt-prefetch
-Qauto-ilp32 /F1000000000 shlW64M.lib            -link /FORCE:MULTIPLE
```

C++ benchmarks:
```
-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qansi-alias -Qopt-prefetch
-Qcxx-features -Qauto-ilp32 /F1000000000 shlW64M.lib
            -link /FORCE:MULTIPLE
```

Fortran benchmarks:
```
-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qansi-alias -Qopt-prefetch
/F1000000000 shlW64M.lib            -link /FORCE:MULTIPLE
```

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qansi-alias -Qopt-prefetch -Qauto-ilp32 /F1000000000 shlW64M.lib -link /FORCE:MULTIPLE

## Peak Compiler Invocation

C benchmarks:
icl -Qvc12 -Qstd=c99

C++ benchmarks:
icl -Qvc12

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
icl -Qvc12 -Qstd=c99 ifort

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: -QxCORE-AVX2 -Qprof_gen(pass 1) -Qprof_use(pass 2) -Qipo -O3 -Qprec-div- -Qansi-alias -Qopt-prefetch -Qauto-ilp32 /F1000000000 shlW64M.lib -link /FORCE:MULTIPLE

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -QxCORE-AVX2(pass 2) -Qprof_gen(pass 1) -Qprof_use(pass 2) -Qipo -O3 -Qprec-div- -Oa -Qauto-ilp32 /F1000000000 shlW64M.lib -link /FORCE:MULTIPLE

447.dealII: basepeak = yes

Continued on next page

## Peak Optimization Flags (Continued)

450.soplex: basepeak = yes

453.povray: -QxCORE-AVX2(pass 2) -Qprof_gen(pass 1) -Qprof_use(pass 2) -Qipo -O3 -Qprec-div- -Qopt-prefetch -Qauto-ilp32 /F1000000000 shlW64M.lib -link /FORCE:MULTIPLE

Fortran benchmarks:

410.bwaves: -QxCORE-AVX2 -Qprof_gen(pass 1) -Qprof_use(pass 2) -Qipo -O3 -Qprec-div- -Qansi-alias -Qopt-prefetch /F1000000000 shlW64M.lib -link /FORCE:MULTIPLE

416.gamess: basepeak = yes

434.zeusmp: basepeak = yes

437.leslie3d: Same as 410.bwaves

459.GemsFDTD: Same as 410.bwaves

465.tonto: -QxCORE-AVX2(pass 2) -Qprof_gen(pass 1) -Qprof_use(pass 2) -Qipo -O3 -Qprec-div- -Qunroll4 -Qauto /F1000000000 shlW64M.lib -link /FORCE:MULTIPLE

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-windows.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-windows.xml

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