SPEC® CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Lenovo Group Limited

(Test Sponsor: Intel Corporation)

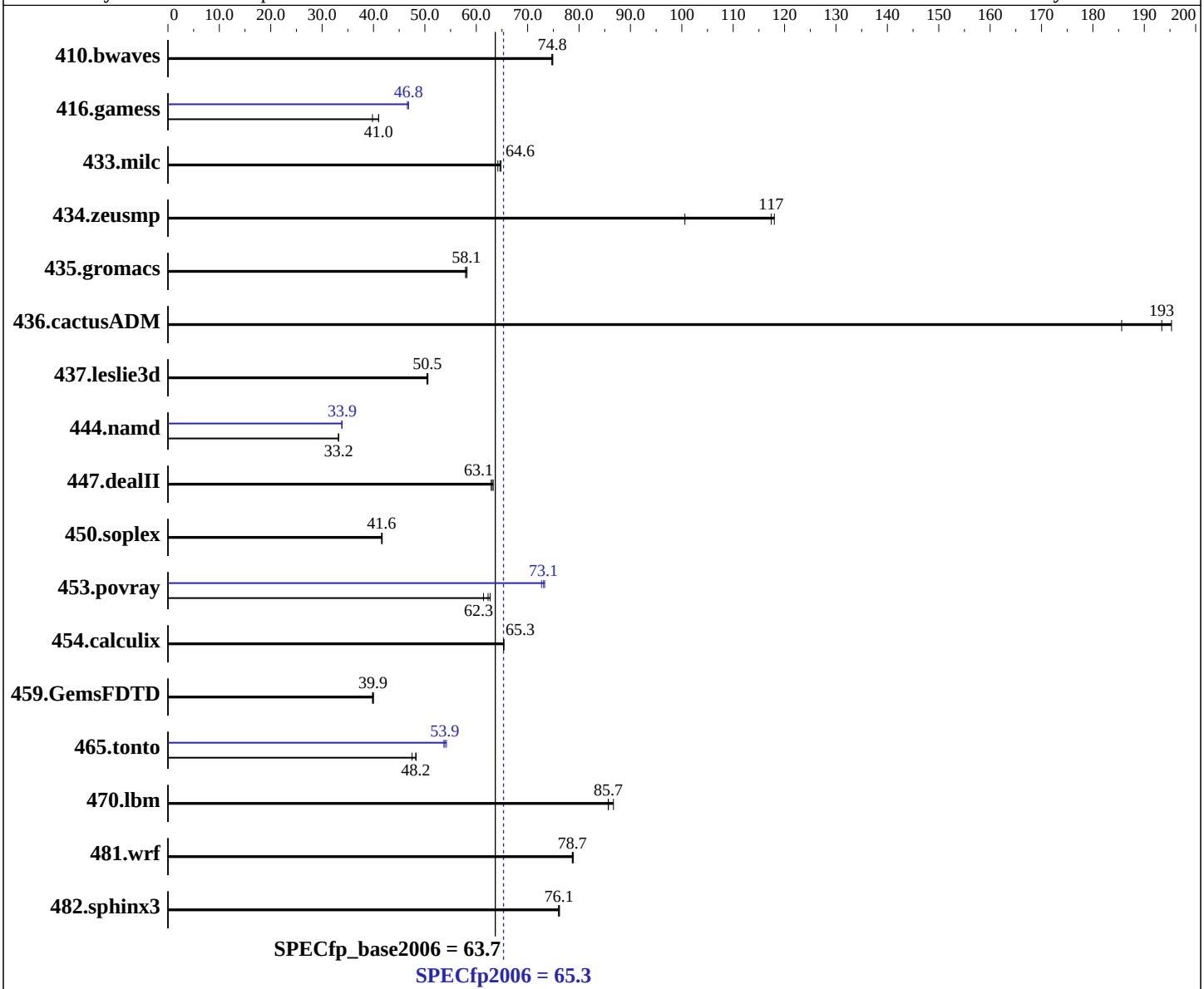
Lenovo Thinkpad T460p 20FW002DUS (Intel Core i5-6440HQ)

SPECfp®2006 = 65.3

SPECfp_base2006 = 63.7

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

Test date: Apr-2016
Hardware Availability: Mar-2016
Software Availability: Nov-2015



Hardware

CPU Name:	Intel Core i5-6440HQ
CPU Characteristics:	Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz:	2600
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip
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

Continued on next page

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:	Yes

Continued on next page

SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Lenovo Group Limited

(Test Sponsor: Intel Corporation)

Lenovo Thinkpad T460p 20FW002DUS (Intel Core i5-6440HQ)

SPECfp2006 = 65.3

SPECfp_base2006 = 63.7

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

Test date: Apr-2016
Hardware Availability: Mar-2016
Software Availability: Nov-2015

L3 Cache:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	8 GB (1 x 8 GB 2Rx4 PC4-2133P-E)
Disk Subsystem:	Toshiba MQ01ACF050 500GB SATA, 7200RPM
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					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**182**	**74.8**	182	74.9	182	74.7	**182**	**74.8**	182	74.9	182	74.7
416.gamess	492	39.8	477	41.0	**478**	**41.0**	420	46.6	**419**	**46.8**	419	46.8
433.milc	142	64.8	**142**	**64.6**	143	64.2	142	64.8	**142**	**64.6**	143	64.2
434.zeusmp	90.5	101	**77.5**	**117**	77.1	118	90.5	101	**77.5**	**117**	77.1	118
435.gromacs	123	57.9	123	58.2	**123**	**58.1**	123	57.9	123	58.2	**123**	**58.1**
436.cactusADM	64.4	186	**61.8**	**193**	61.2	195	64.4	186	**61.8**	**193**	61.2	195
437.leslie3d	187	50.4	**186**	**50.5**	186	50.6	187	50.4	**186**	**50.5**	186	50.6
444.namd	**242**	**33.2**	241	33.2	242	33.2	236	33.9	237	33.8	**237**	**33.9**
447.dealII	182	62.9	181	63.3	**181**	**63.1**	182	62.9	181	63.3	**181**	**63.1**
450.soplex	**201**	**41.6**	200	41.7	201	41.6	**201**	**41.6**	200	41.7	201	41.6
453.povray	86.6	61.4	84.8	62.7	**85.4**	**62.3**	**72.8**	**73.1**	73.2	72.7	72.6	73.3
454.calculix	**126**	**65.3**	126	65.4	126	65.3	**126**	**65.3**	126	65.4	126	65.3
459.GemsFDTD	266	39.8	266	40.0	**266**	**39.9**	266	39.8	266	40.0	**266**	**39.9**
465.tonto	**204**	**48.2**	207	47.5	204	48.3	181	54.2	**183**	**53.9**	183	53.7
470.lbm	**160**	**85.7**	159	86.7	160	85.7	**160**	**85.7**	159	86.7	160	85.7
481.wrf	142	78.9	**142**	**78.7**	142	78.7	142	78.9	**142**	**78.7**	142	78.7
482.sphinx3	256	76.0	**256**	**76.1**	256	76.2	256	76.0	**256**	**76.1**	256	76.2

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)
```

Platform Notes

```
Sysinfo program C:\SPEC16.0/Docs/sysinfo
$Rev: 6775 $ $Date:: 2011-08-16 #$ \8787f7622badcf24e01c368b1db4377c
running on Clt507B9DA65255 Sat Apr 30 09:46:09 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

Platform Notes (Continued)

```
      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: LENOVO
    System Model   : 20FW002DUS
    Processor(s)   : 1 Processor(s) Installed.
         [01]: Intel64 Family 6 Model 94 Stepping 3 GenuineIntel ~2600 Mhz
    BIOS Version   : LENOVO R07ET62W (2.02 ), 3/4/2016
    Total Physical Memory: 8,058 MB

    Trying 'wmic cpu get /value'
    DeviceID       : CPU0
    L2CacheSize    : 1024
    L3CacheSize    : 6144
    MaxClockSpeed : 2601
    Name           : Intel(R) Core(TM) i5-6440HQ CPU @ 2.60GHz
    NumberOfCores : 4
    NumberOfLogicalProcessors: 4

    (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.

   OMP_NUM_THREADS set to number of processors cores
   KMP_AFFINITY set to granularity=fine,scatter
   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- -Qparallel -Qansi-alias -Qopt-prefetch /F1000000000

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

Fortran benchmarks:
-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias -Qopt-prefetch /F1000000000

Continued on next page

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
`-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias -Qopt-prefetch /F1000000000`

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: `basepeak = yes`

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 /F1000000000 shlW64M.lib -link /FORCE:MULTIPLE`

447.dealII: `basepeak = yes`

450.soplex: `basepeak = yes`

Continued on next page

Peak Optimization Flags (Continued)

453.povray: `-QxCORE-AVX2`(pass 2) `-Qprof_gen`(pass 1) `-Qprof_use`(pass 2) `-Qipo -O3 -Qprec-div- -Qunroll4 -Qansi-alias /F1000000000 shlW64M.lib -link /FORCE:MULTIPLE`

Fortran benchmarks:

410.bwaves: `basepeak = yes`

416.gamess: `-QxCORE-AVX2`(pass 2) `-Qprof_gen`(pass 1) `-Qprof_use`(pass 2) `-Qipo -O3 -Qprec-div- -Qunroll2 -Ob0 -Qansi-alias -Qscalar-rep- /F1000000000`

434.zeusmp: `basepeak = yes`

437.leslie3d: `basepeak = yes`

459.GemsFDTD: `basepeak = yes`

465.tonto: `-QxCORE-AVX2`(pass 2) `-Qprof_gen`(pass 1) `-Qprof_use`(pass 2) `-Qipo -O3 -Qprec-div- -Qunroll4 -Qauto -Qinline-calloc /F1000000000`

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`

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Report generated on Wed Jun 1 19:10:20 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 1 June 2016.