# SPEC® CFP2006 Result

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## Fujitsu

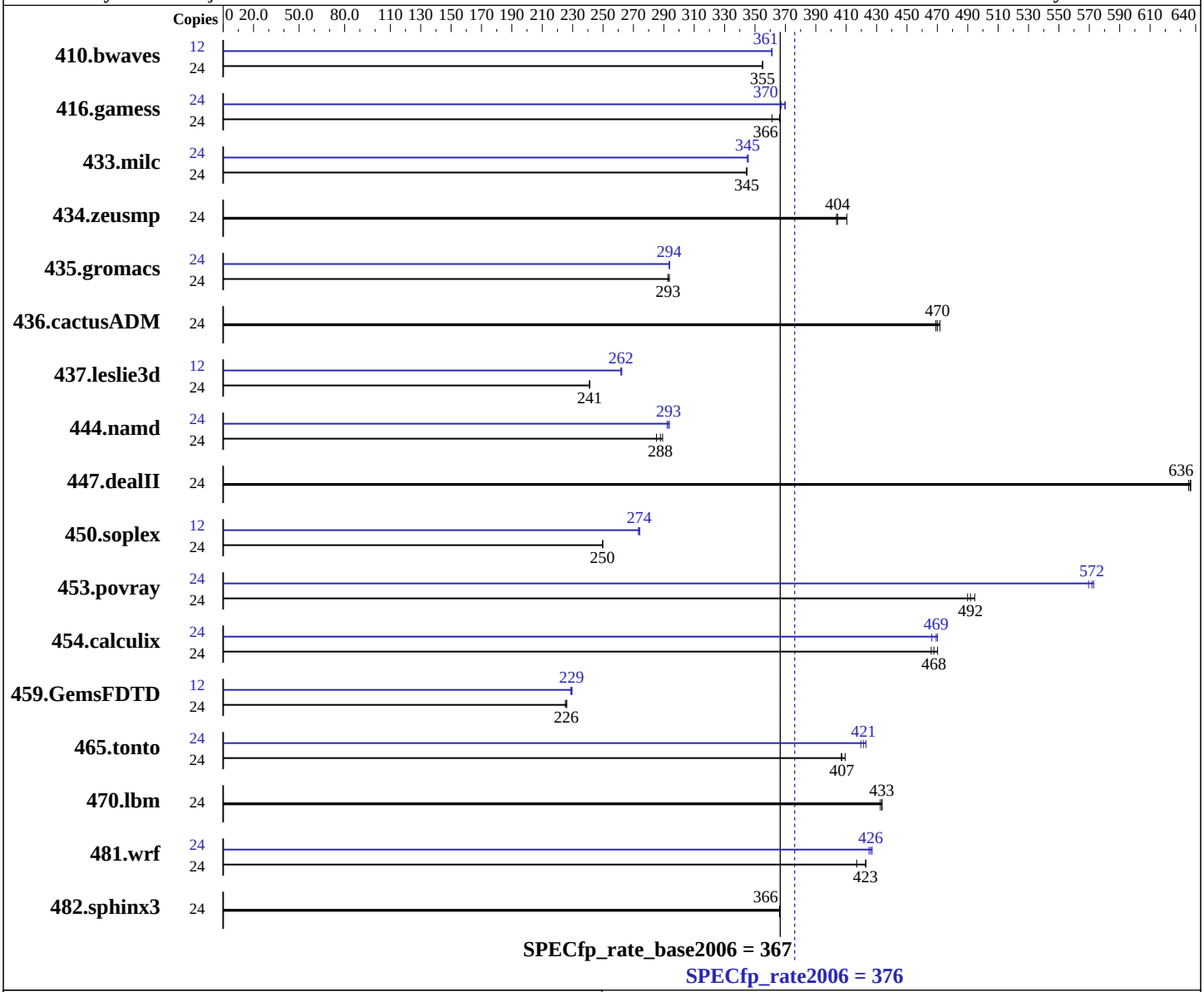
PRIMERGY RX300 S7, Intel Xeon E5-2640, 2.50 GHz

**SPECfp®_rate2006 = 376**

**SPECfp_rate_base2006 = 367**

**CPU2006 license:** 19
**Test sponsor:** Fujitsu
**Tested by:** Fujitsu

**Test date:** Mar-2012
**Hardware Availability:** Mar-2012
**Software Availability:** Dec-2011




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2640 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.0 GHz |
| CPU MHz: | 2500 |
| FPU: | Integrated |
| CPU(s) enabled: | 12 cores, 2 chips, 6 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1,2 chips |
| 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 6.2 (Santiago)<br>2.6.32-220.el6.x86_64 |
| Compiler: | C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux;<br>Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | No |
| File System: | ext4 |

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L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (16 x 8 GB 2Rx4 PC3L-12800R-11, ECC, running at 1333 MHz and CL9)
Disk Subsystem: 1 x SATA, 500 GB, 7200 RPM
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 24 | 918 | 355 | 919 | 355 | **919** | **355** | 12 | **452** | **361** | 452 | 361 | 451 | 361 |
| 416.gamess | 24 | **1283** | **366** | 1301 | 361 | 1282 | 367 | 24 | 1270 | 370 | **1271** | **370** | 1279 | 367 |
| 433.milc | 24 | 639 | 345 | **639** | **345** | 640 | 344 | 24 | **638** | **345** | 638 | 346 | 639 | 345 |
| 434.zeusmp | 24 | **540** | **404** | 541 | 404 | 532 | 410 | 24 | **540** | **404** | 541 | 404 | 532 | 410 |
| 435.gromacs | 24 | **585** | **293** | 583 | 294 | 585 | 293 | 24 | 584 | 294 | **584** | **294** | 584 | 294 |
| 436.cactusADM | 24 | 611 | 469 | **610** | **470** | 608 | 472 | 24 | 611 | 469 | **610** | **470** | 608 | 472 |
| 437.leslie3d | 24 | 936 | 241 | **935** | **241** | 935 | 241 | 12 | 430 | 262 | 431 | 262 | **431** | **262** |
| 444.namd | 24 | **669** | **288** | 666 | 289 | 675 | 285 | 24 | **657** | **293** | 655 | 294 | 659 | 292 |
| 447.dealII | 24 | **431** | **636** | 432 | 635 | 431 | 637 | 24 | **431** | **636** | 432 | 635 | 431 | 637 |
| 450.soplex | 24 | 801 | 250 | **802** | **250** | 802 | 250 | 12 | 366 | 273 | **365** | **274** | 365 | 274 |
| 453.povray | 24 | 261 | 490 | **260** | **492** | 258 | 495 | 24 | 223 | 573 | **223** | **572** | 224 | 570 |
| 454.calculix | 24 | 421 | 470 | 425 | 466 | **423** | **468** | 24 | **422** | **469** | 425 | 466 | 421 | 470 |
| 459.GemsFDTD | 24 | **1128** | **226** | 1131 | 225 | 1126 | 226 | 12 | 554 | 230 | **555** | **229** | 556 | 229 |
| 465.tonto | 24 | **580** | **407** | 577 | 409 | 581 | 407 | 24 | 563 | 420 | 558 | 423 | **560** | **421** |
| 470.lbm | 24 | 760 | 434 | 762 | 432 | **761** | **433** | 24 | 760 | 434 | 762 | 432 | **761** | **433** |
| 481.wrf | 24 | 634 | 423 | **634** | **423** | 643 | 417 | 24 | **629** | **426** | 628 | 427 | 631 | 425 |
| 482.sphinx3 | 24 | 1278 | 366 | 1277 | 366 | **1277** | **366** | 24 | 1278 | 366 | 1277 | 366 | **1277** | **366** |

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"
```

## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/SPECcpu2006/libs/32:/SPECcpu2006/libs/64"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RHEL5.5
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
 For information about Fujitsu please visit: http://www.fujitsu.com
```

## 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
     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:
`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32 -ansi-alias -opt-mem-layout-trans=3`

C++ benchmarks:
`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32 -ansi-alias -opt-mem-layout-trans=3`

Fortran benchmarks:
`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch`

Benchmarks using both Fortran and C:
`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32 -ansi-alias -opt-mem-layout-trans=3`

## Peak Compiler Invocation

C benchmarks:
`icc -m64`

C++ benchmarks (except as noted below):
`icpc -m64`

450.soplex: `icpc -m32`

Fortran benchmarks:
`ifort -m64`

Benchmarks using both Fortran and C:
`icc -m64 ifort -m64`

## Peak 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`
453.povray: `-DSPEC_CPU_LP64`
454.calculix: `-DSPEC_CPU_LP64 -nofor_main`
465.tonto: `-DSPEC_CPU_LP64`

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## Peak Portability Flags (Continued)

470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

## Peak Optimization Flags

C benchmarks:

433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32 -opt-mem-layout-trans=3

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static

416.gamess: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

459.GemsFDTD: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto -inline-calloc -opt-malloc-options=3

Continued on next page

## Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: `-xAVX`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-opt-prefetch -static -auto-ilp32 -opt-mem-layout-trans=3`

436.cactusADM: `basepeak = yes`

454.calculix: `-xAVX -ipo -O3 -no-prec-div -static -auto-ilp32 -opt-mem-layout-trans=3`

481.wrf: `Same as 454.calculix`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Fujitsu-Platform.20120320.html
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Fujitsu-Platform.20120320.xml
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml


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