# SPEC® CFP2006 Result

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## Fujitsu

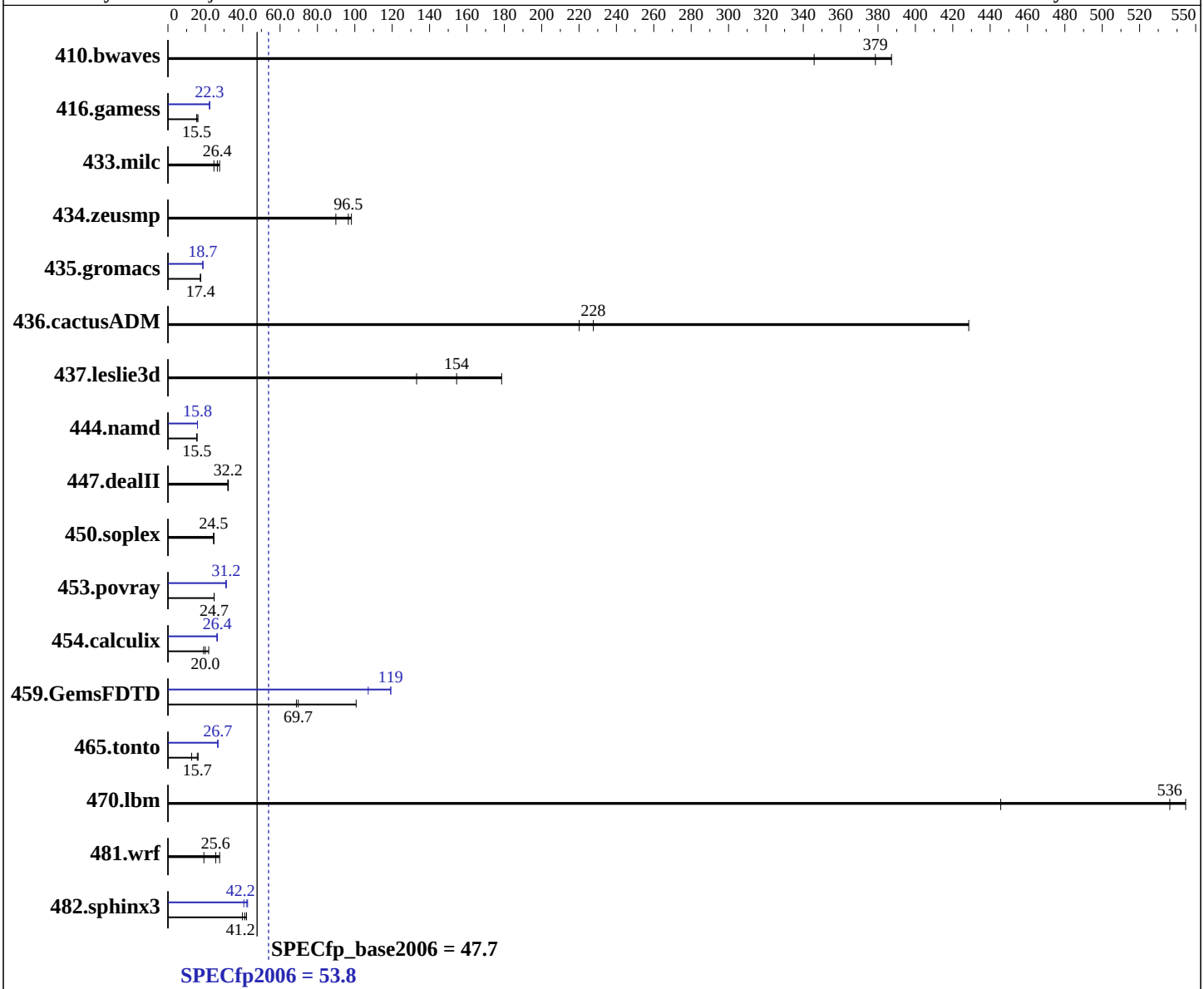
PRIMERGY RX600 S6, Intel Xeon E7-4860, 2.27 GHz

SPECfp®2006 = 53.8

SPECfp_base2006 = 47.7

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

**Test date:** Jul-2011
**Hardware Availability:** Jul-2011
**Software Availability:** Jul-2011




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-4860 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.67 GHz |
| CPU MHz: | 2267 |
| FPU: | Integrated |
| CPU(s) enabled: | 40 cores, 4 chips, 10 cores/chip |
| CPU(s) orderable: | 2,3,4 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: | SUSE Linux Enterprise Server 11 (x86_64) SP1, Kernel 2.6.32.12-0.7-default |
| Compiler: | Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0.4.191 Build 20110427 |
| Auto Parallel: | Yes |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |

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L3 Cache: 24 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (32 x 8 GB 4Rx8 PC3L-8500R-7, ECC)
Disk Subsystem: 1 x SAS, 600 GB, 10000 RPM
Other Hardware: --

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 | 35.1 | 387 | **35.9** | **379** | 39.3 | 346 | 35.1 | 387 | **35.9** | **379** | 39.3 | 346 |
| 416.gamess | **1265** | **15.5** | 1267 | 15.5 | 1219 | 16.1 | **880** | **22.3** | 880 | 22.2 | 878 | 22.3 |
| 433.milc | 373 | 24.6 | **347** | **26.4** | 332 | 27.6 | 373 | 24.6 | **347** | **26.4** | 332 | 27.6 |
| 434.zeusmp | **94.3** | **96.5** | 92.7 | 98.2 | 101 | 89.8 | **94.3** | **96.5** | 92.7 | 98.2 | 101 | 89.8 |
| 435.gromacs | 410 | 17.4 | 408 | 17.5 | **410** | **17.4** | 382 | 18.7 | **382** | **18.7** | 382 | 18.7 |
| 436.cactusADM | 27.9 | 429 | **52.5** | **228** | 54.3 | 220 | 27.9 | 429 | **52.5** | **228** | 54.3 | 220 |
| 437.leslie3d | **60.8** | **154** | 52.6 | 179 | 70.6 | 133 | **60.8** | **154** | 52.6 | 179 | 70.6 | 133 |
| 444.namd | **517** | **15.5** | 518 | 15.5 | 517 | 15.5 | 508 | 15.8 | 507 | 15.8 | **507** | **15.8** |
| 447.dealII | 354 | 32.3 | **355** | **32.2** | 357 | 32.0 | 354 | 32.3 | **355** | **32.2** | 357 | 32.0 |
| 450.soplex | **341** | **24.5** | 341 | 24.5 | 340 | 24.6 | **341** | **24.5** | 341 | 24.5 | 340 | 24.6 |
| 453.povray | 215 | 24.7 | **215** | **24.7** | 215 | 24.7 | **171** | **31.2** | 172 | 30.9 | 171 | 31.2 |
| 454.calculix | 433 | 19.1 | **413** | **20.0** | 378 | 21.8 | **312** | **26.4** | 312 | 26.4 | 315 | 26.2 |
| 459.GemsFDTD | **152** | **69.7** | 154 | 68.7 | 105 | 101 | 89.0 | 119 | **89.0** | **119** | 99.0 | 107 |
| 465.tonto | 775 | 12.7 | 609 | 16.1 | **627** | **15.7** | **369** | **26.7** | 369 | 26.6 | 369 | 26.7 |
| 470.lbm | 30.8 | 446 | **25.6** | **536** | 25.2 | 545 | 30.8 | 446 | **25.6** | **536** | 25.2 | 545 |
| 481.wrf | 404 | 27.7 | **437** | **25.6** | 581 | 19.2 | 404 | 27.7 | **437** | **25.6** | 581 | 19.2 |
| 482.sphinx3 | 463 | 42.1 | **473** | **41.2** | 489 | 39.9 | 480 | 40.6 | 457 | 42.6 | **462** | **42.2** |

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

## Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'nodev /mnt/hugepages hugetlbfs defaults 0 0' added to /etc/fstab
echo 36000 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

```
BIOS configuration:
Data Reuse Optimization = Disable
Performance/Power Setting = Traditional
Intel HT Technology = Disable
```

## General Notes

```
OMP_NUM_THREADS set to number of cores
Binaries were compiled on RHEL5.5
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:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

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## Base Optimization Flags (Continued)

Fortran benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch`

Benchmarks using both Fortran and C:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -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`

## Peak Optimization Flags

C benchmarks:

433.milc: `basepeak = yes`

470.lbm: `basepeak = yes`

482.sphinx3: `-xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias -parallel`

C++ benchmarks:

444.namd: `-xSSE4.2`(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`

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## Peak Optimization Flags (Continued)

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xSSE4.2(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: basepeak = yes

459.GemsFDTD: -xSSE4.2(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 -opt-prefetch -parallel -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc -opt-malloc-options=3 -auto -unroll4 -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

435.gromacs: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32 -ansi-alias

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -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-ic12.0-linux64-revB.20110316.html
http://www.spec.org/cpu2006/flags/Fujitsu-Platform.20110705.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.20110316.xml
http://www.spec.org/cpu2006/flags/Fujitsu-Platform.20110705.xml

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For other inquiries, please contact webmaster@spec.org.

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