



# SPEC® CFP2006 Result

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## Fujitsu

SPECfp®\_rate2006 = 376

PRIMERGY RX200 S7, Intel Xeon E5-2640, 2.50 GHz

SPECfp\_rate\_base2006 = 367

CPU2006 license: 19

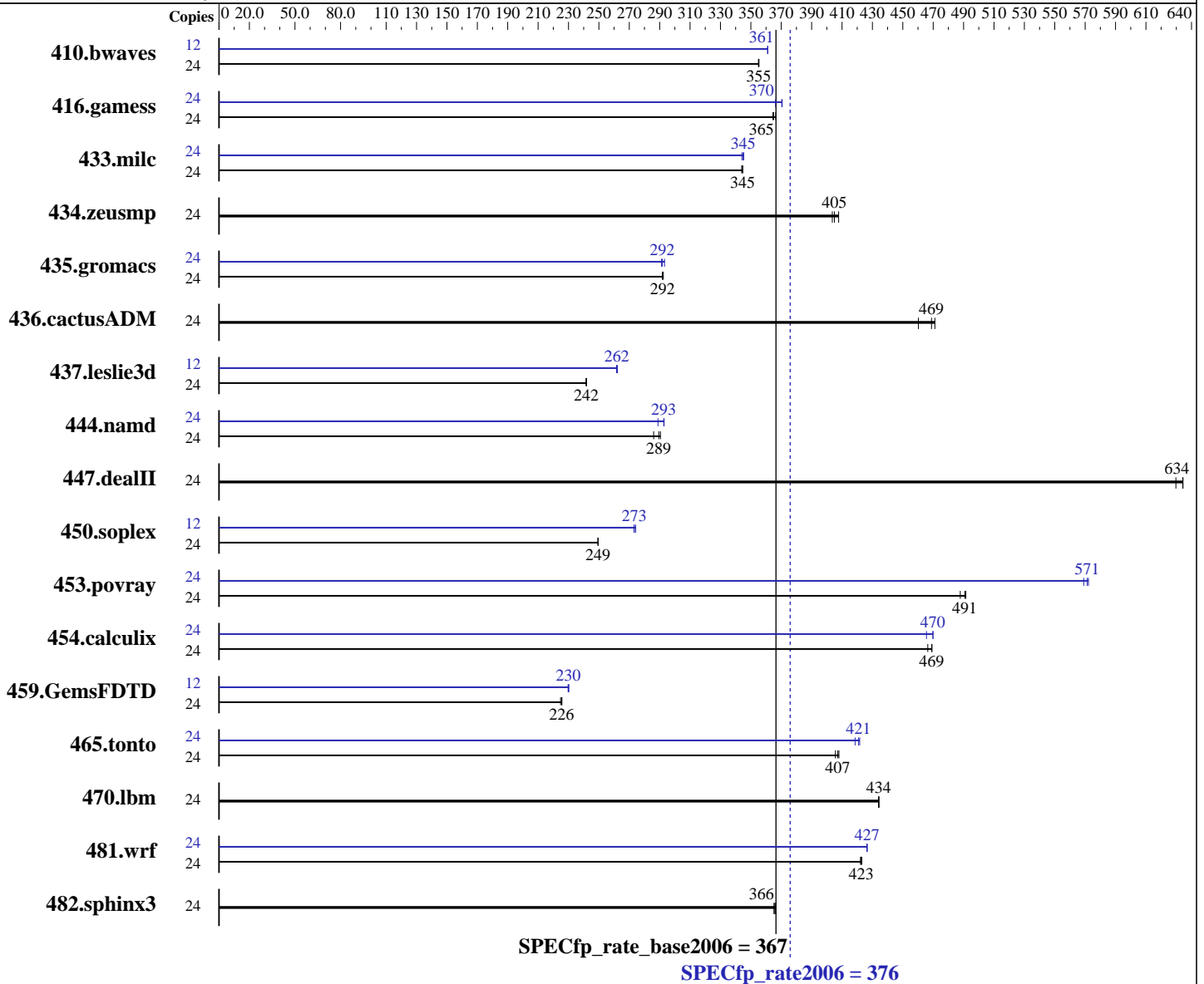
Test sponsor: Fujitsu

Tested by: Fujitsu

Test date: Jan-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)  
 2.6.32-220.el6.x86\_64  
 Compiler: C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux;  
 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     | 919        | 355        | <b>918</b>  | <b>355</b> | 918         | 355        | 12     | 452        | 361        | <b>452</b>  | <b>361</b> | 452        | 361        |  |  |
| 416.gamess    | 24     | 1289       | 365        | 1283        | 366        | <b>1287</b> | <b>365</b> | 24     | 1268       | 371        | <b>1269</b> | <b>370</b> | 1283       | 366        |  |  |
| 433.milc      | 24     | <b>639</b> | <b>345</b> | 639         | 345        | 641         | 344        | 24     | 640        | 344        | 638         | 345        | <b>639</b> | <b>345</b> |  |  |
| 434.zeusmp    | 24     | 541        | 404        | 536         | 408        | <b>539</b>  | <b>405</b> | 24     | 541        | 404        | 536         | 408        | <b>539</b> | <b>405</b> |  |  |
| 435.gromacs   | 24     | 587        | 292        | <b>587</b>  | <b>292</b> | 586         | 292        | 24     | 584        | 293        | 588         | 291        | <b>587</b> | <b>292</b> |  |  |
| 436.cactusADM | 24     | <b>612</b> | <b>469</b> | 623         | 460        | 609         | 471        | 24     | <b>612</b> | <b>469</b> | 623         | 460        | 609        | 471        |  |  |
| 437.leslie3d  | 24     | 934        | 242        | 933         | 242        | <b>933</b>  | <b>242</b> | 12     | <b>431</b> | <b>262</b> | 431         | 262        | 430        | 262        |  |  |
| 444.namd      | 24     | 673        | 286        | <b>665</b>  | <b>289</b> | 663         | 291        | 24     | <b>658</b> | <b>293</b> | 666         | 289        | 657        | 293        |  |  |
| 447.dealII    | 24     | 436        | 630        | <b>433</b>  | <b>634</b> | 433         | 634        | 24     | 436        | 630        | <b>433</b>  | <b>634</b> | 433        | 634        |  |  |
| 450.soplex    | 24     | 803        | 249        | <b>802</b>  | <b>249</b> | 802         | 250        | 12     | 366        | 273        | 365         | 274        | <b>366</b> | <b>273</b> |  |  |
| 453.povray    | 24     | <b>260</b> | <b>491</b> | 262         | 488        | 260         | 491        | 24     | 224        | 569        | 223         | 572        | <b>223</b> | <b>571</b> |  |  |
| 454.calculix  | 24     | <b>422</b> | <b>469</b> | 424         | 466        | 422         | 469        | 24     | <b>421</b> | <b>470</b> | 421         | 470        | 425        | 466        |  |  |
| 459.GemsFDTD  | 24     | 1129       | 226        | <b>1129</b> | <b>226</b> | 1133        | 225        | 12     | <b>554</b> | <b>230</b> | 554         | 230        | 553        | 230        |  |  |
| 465.tonto     | 24     | 582        | 406        | <b>580</b>  | <b>407</b> | 579         | 408        | 24     | 564        | 419        | 560         | 422        | <b>561</b> | <b>421</b> |  |  |
| 470.lbm       | 24     | 759        | 434        | <b>759</b>  | <b>434</b> | 760         | 434        | 24     | 759        | 434        | <b>759</b>  | <b>434</b> | 760        | 434        |  |  |
| 481.wrf       | 24     | <b>634</b> | <b>423</b> | 634         | 423        | 635         | 422        | 24     | <b>629</b> | <b>427</b> | 628         | 427        | 629        | 426        |  |  |
| 482.sphinx3   | 24     | 1281       | 365        | <b>1279</b> | <b>366</b> | 1277        | 366        | 24     | 1281       | 365        | <b>1279</b> | <b>366</b> | 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"



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## 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



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## 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

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## 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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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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