



# SPEC<sup>®</sup> CFP2006 Result

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## Fujitsu

SPECfp<sup>®</sup>\_rate2006 = 477

PRIMERGY TX2560 M1, Intel Xeon E5-2620 v3, 2.4 GHz

SPECfp\_rate\_base2006 = 466

CPU2006 license: 19

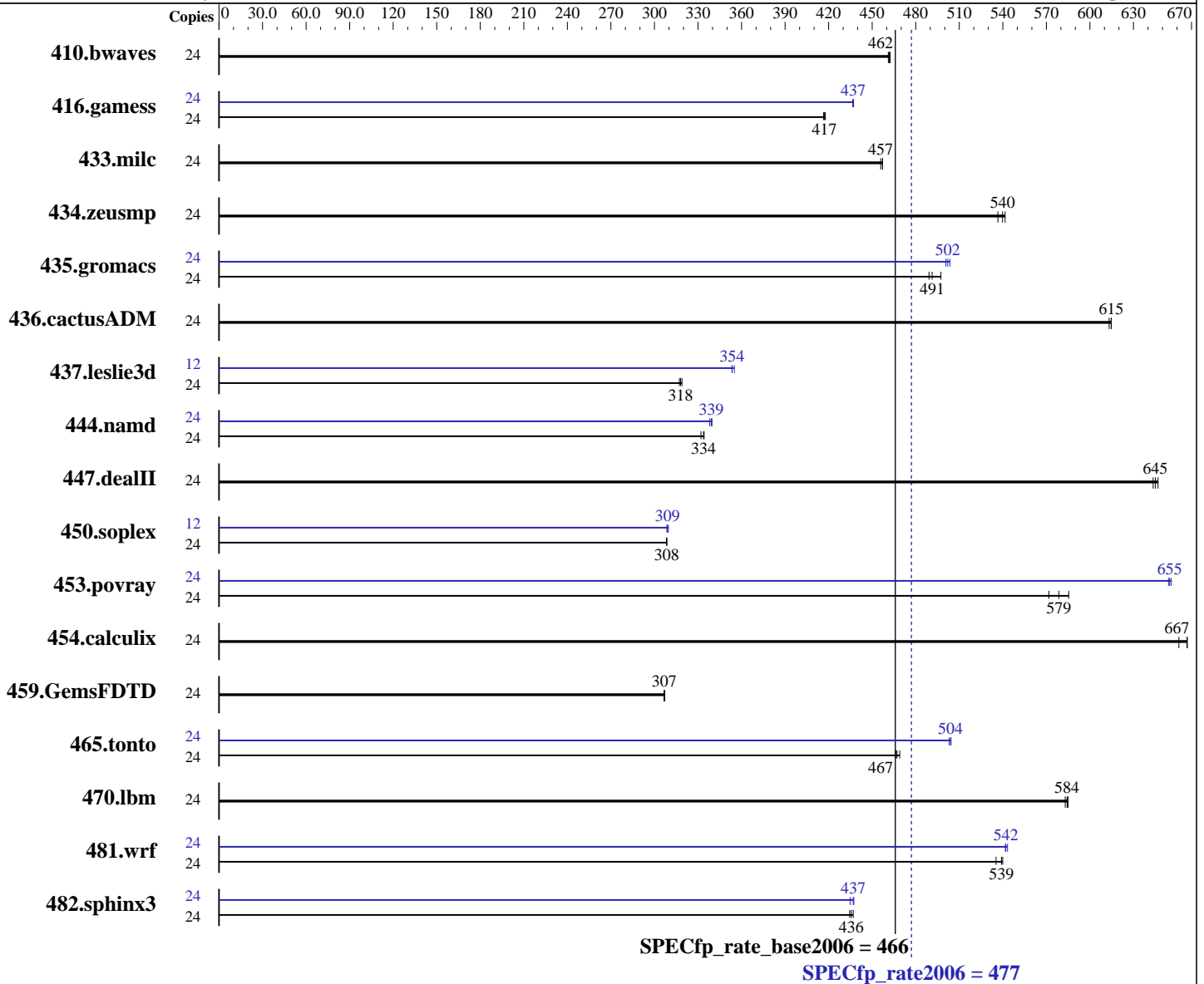
Test sponsor: Fujitsu

Tested by: Fujitsu

Test date: Apr-2015

Hardware Availability: Apr-2015

Software Availability: Sep-2014



### Hardware

CPU Name: Intel Xeon E5-2620 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 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: Red Hat Enterprise Linux Server release 7.1 (Maipo)  
 Kernel 3.10.0-229.el7.x86\_64  
 Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;  
 Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux  
 Auto Parallel: No  
 File System: xfs

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L3 Cache: 15 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)  
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     | 705        | 462        | <b>706</b> | <b>462</b> | 707         | 461        | 24     | 705        | 462        | <b>706</b> | <b>462</b> | 707         | 461        |  |  |
| 416.gamess    | 24     | 1125       | 418        | 1128       | 416        | <b>1127</b> | <b>417</b> | 24     | 1075       | 437        | 1076       | 437        | <b>1075</b> | <b>437</b> |  |  |
| 433.milc      | 24     | 483        | 456        | 482        | 457        | <b>482</b>  | <b>457</b> | 24     | 483        | 456        | 482        | 457        | <b>482</b>  | <b>457</b> |  |  |
| 434.zeusmp    | 24     | 403        | 542        | <b>405</b> | <b>540</b> | 407         | 537        | 24     | 403        | 542        | <b>405</b> | <b>540</b> | 407         | 537        |  |  |
| 435.gromacs   | 24     | <b>349</b> | <b>491</b> | 345        | 497        | 350         | 489        | 24     | <b>341</b> | <b>502</b> | 342        | 501        | 340         | 504        |  |  |
| 436.cactusADM | 24     | 467        | 615        | 468        | 613        | <b>467</b>  | <b>615</b> | 24     | 467        | 615        | 468        | 613        | <b>467</b>  | <b>615</b> |  |  |
| 437.leslie3d  | 24     | 711        | 317        | 707        | 319        | <b>709</b>  | <b>318</b> | 12     | 318        | 355        | <b>319</b> | <b>354</b> | 319         | 353        |  |  |
| 444.namd      | 24     | <b>577</b> | <b>334</b> | 576        | 334        | 580         | 332        | 24     | 567        | 340        | <b>568</b> | <b>339</b> | 569         | 338        |  |  |
| 447.dealII    | 24     | <b>426</b> | <b>645</b> | 427        | 644        | 424         | 647        | 24     | <b>426</b> | <b>645</b> | 427        | 644        | 424         | 647        |  |  |
| 450.soplex    | 24     | 649        | 308        | <b>649</b> | <b>308</b> | 649         | 309        | 12     | <b>324</b> | <b>309</b> | 324        | 309        | 323         | 310        |  |  |
| 453.povray    | 24     | 223        | 572        | <b>221</b> | <b>579</b> | 218         | 585        | 24     | 195        | 656        | <b>195</b> | <b>655</b> | 195         | 654        |  |  |
| 454.calculix  | 24     | 299        | 661        | <b>297</b> | <b>667</b> | 297         | 667        | 24     | 299        | 661        | <b>297</b> | <b>667</b> | 297         | 667        |  |  |
| 459.GemsFDTD  | 24     | 829        | 307        | <b>830</b> | <b>307</b> | 830         | 307        | 24     | 829        | 307        | <b>830</b> | <b>307</b> | 830         | 307        |  |  |
| 465.tonto     | 24     | <b>506</b> | <b>467</b> | 506        | 466        | 504         | 469        | 24     | 468        | 504        | <b>469</b> | <b>504</b> | 469         | 503        |  |  |
| 470.lbm       | 24     | <b>564</b> | <b>584</b> | 566        | 583        | 564         | 585        | 24     | <b>564</b> | <b>584</b> | 566        | 583        | 564         | 585        |  |  |
| 481.wrf       | 24     | <b>497</b> | <b>539</b> | 501        | 535        | 497         | 540        | 24     | <b>495</b> | <b>542</b> | 495        | 542        | 493         | 543        |  |  |
| 482.sphinx3   | 24     | 1071       | 437        | 1077       | 434        | <b>1074</b> | <b>436</b> | 24     | 1070       | 437        | 1076       | 435        | <b>1071</b> | <b>437</b> |  |  |

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"

## Platform Notes

BIOS configuration:  
Energy Performance = Performance  
Utilization Profile = Unbalanced

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## Platform Notes (Continued)

QPI snoop mode: Early Snoop  
COD Enable = Disabled, Early Snoop = Enabled  
CPU C1E Support = Disabled

## General Notes

Environment variables set by runspec before the start of the run:

```
LD_LIBRARY_PATH = "/home/SPECcpu2006/libs/32:/home/SPECcpu2006/libs/64:/home/SPECcpu2006/sh"
```

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0

Transparent Huge Pages enabled with:

```
echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

Filesystem page cache cleared with:

```
echo 1> /proc/sys/vm/drop_caches
```

runspec command invoked through numactl i.e.:

```
numactl --interleave=all runspec <etc>
```

This result was measured on the PRIMERGY RX2560 M1. The PRIMERGY RX2560 M1 and the PRIMERGY TX2560 M1 are electronically equivalent.

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

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## Base Portability Flags (Continued)

```

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:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

```

C++ benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

```

Fortran benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

```

Benchmarks using both Fortran and C:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -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 -L/opt/intel/composer_xe_2015/lib/ia32

```

Fortran benchmarks:

```

ifort -m64

```

Benchmarks using both Fortran and C:

```

icc -m64 ifort -m64

```



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**Test sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test date:** Apr-2015

**Hardware Availability:** Apr-2015

**Software Availability:** Sep-2014

## 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
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

```

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3  
-unroll2

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias  
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3

453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4  
-ansi-alias

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## Peak Optimization Flags (Continued)

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(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-

434.zeusmp: basepeak = yes

437.leslie3d: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xCORE-AVX2(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

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)  
-opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-HSW-RevA.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-HSW-RevA.xml>



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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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