



SPEC[®] CFP2006 Result

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Bull SAS

SPECfp[®]_rate2006 = 272

NovaScale R460 F2 (Intel Xeon X5690, 3.46 GHz)

SPECfp_rate_base2006 = 265

CPU2006 license: 20

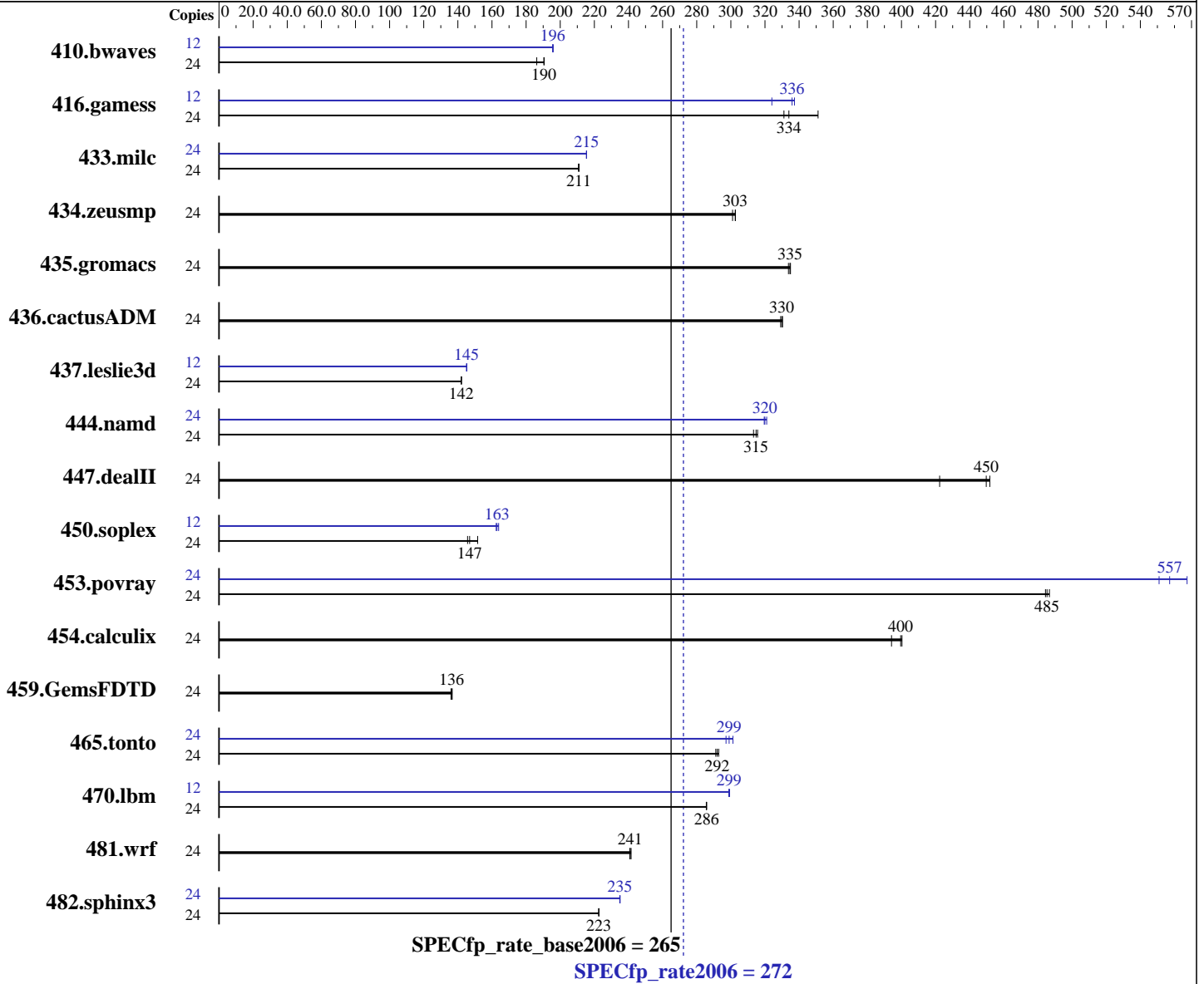
Test sponsor: Bull SAS

Tested by: Dell Inc.

Test date: Feb-2011

Hardware Availability: Feb-2011

Software Availability: Jan-2011



Hardware

CPU Name: Intel Xeon X5690
 CPU Characteristics: Intel Turbo Boost Technology up to 3.73 GHz
 CPU MHz: 3467
 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: SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
 Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0.1.116 Build 20101116
 Auto Parallel: No
 File System: ext3
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit

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L3 Cache: 12 MB I+D on chip per chip
 Other Cache: None
 Memory: 48 GB (12 x 4 GB 2Rx4 PC3-10600R-9, ECC)
 Disk Subsystem: 1 x 146 GB 15000 RPM SAS
 Other Hardware: None

Peak Pointers: 32/64-bit
 Other Software: Binaries compiled on RHEL5.5 with
 binutils-2.17.50.0.6-14.el5

Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---------------|--------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------|--------------------|-------------------|--------------------|-------------------|-------------------|-------------------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 24 | <u>1713</u> | <u>190</u> | 1751 | 186 | 1711 | 191 | 12 | <u>833</u> | <u>196</u> | 833 | 196 | 834 | 196 |
| 416.gamess | 24 | <u>1407</u> | <u>334</u> | 1338 | 351 | 1419 | 331 | 12 | 697 | 337 | 725 | 324 | <u>700</u> | <u>336</u> |
| 433.milc | 24 | <u>1045</u> | <u>211</u> | 1045 | 211 | 1044 | 211 | 24 | <u>1023</u> | <u>215</u> | 1023 | 215 | 1023 | 215 |
| 434.zeusmp | 24 | <u>722</u> | <u>303</u> | 722 | 303 | 726 | 301 | 24 | <u>722</u> | <u>303</u> | 722 | 303 | 726 | 301 |
| 435.gromacs | 24 | 513 | 334 | <u>512</u> | <u>335</u> | 512 | 335 | 24 | 513 | 334 | <u>512</u> | <u>335</u> | 512 | 335 |
| 436.cactusADM | 24 | 868 | 330 | <u>869</u> | <u>330</u> | 871 | 329 | 24 | 868 | 330 | <u>869</u> | <u>330</u> | 871 | 329 |
| 437.leslie3d | 24 | 1588 | 142 | <u>1588</u> | <u>142</u> | 1588 | 142 | 12 | 777 | 145 | <u>777</u> | <u>145</u> | 777 | 145 |
| 444.namd | 24 | 610 | 316 | <u>611</u> | <u>315</u> | 614 | 313 | 24 | <u>602</u> | <u>320</u> | 600 | 321 | 602 | 320 |
| 447.dealII | 24 | <u>611</u> | <u>450</u> | 650 | 422 | 608 | 452 | 24 | <u>611</u> | <u>450</u> | 650 | 422 | 608 | 452 |
| 450.soplex | 24 | 1320 | 152 | <u>1363</u> | <u>147</u> | 1374 | 146 | 12 | 616 | 162 | <u>614</u> | <u>163</u> | 611 | 164 |
| 453.povray | 24 | 262 | 487 | 264 | 484 | <u>263</u> | <u>485</u> | 24 | <u>229</u> | <u>557</u> | 225 | 567 | 232 | 551 |
| 454.calculix | 24 | 502 | 394 | <u>496</u> | <u>400</u> | 495 | 400 | 24 | 502 | 394 | <u>496</u> | <u>400</u> | 495 | 400 |
| 459.GemsFDTD | 24 | 1873 | 136 | <u>1868</u> | <u>136</u> | 1863 | 137 | 24 | 1873 | 136 | <u>1868</u> | <u>136</u> | 1863 | 137 |
| 465.tonto | 24 | 806 | 293 | <u>809</u> | <u>292</u> | 811 | 291 | 24 | <u>790</u> | <u>299</u> | 795 | 297 | 784 | 301 |
| 470.lbm | 24 | 1154 | 286 | <u>1154</u> | <u>286</u> | 1155 | 286 | 12 | 551 | 299 | <u>552</u> | <u>299</u> | 552 | 299 |
| 481.wrf | 24 | <u>1112</u> | <u>241</u> | 1113 | 241 | 1110 | 242 | 24 | <u>1112</u> | <u>241</u> | 1113 | 241 | 1110 | 242 |
| 482.sphinx3 | 24 | 2101 | 223 | 2102 | 223 | <u>2101</u> | <u>223</u> | 24 | 1989 | 235 | <u>1991</u> | <u>235</u> | 1991 | 235 |

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

Submit Notes

The config file option 'submit' was used.
 numactl was used to bind copies to the cores

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 10800 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```



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Platform Notes

BIOS Settings:

Power Management = Maximum Performance (Default = Active Power Controller)

Data Reuse = Disabled (Default = Enabled)

General Notes

The Dell PowerEdge R710 and the Bull NovaScale R460 F2 models are electronically equivalent. The results have been measured on a Dell PowerEdge R710 model.

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:

-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias

C++ benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias

Fortran benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static

Benchmarks using both Fortran and C:

-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias

Peak Compiler Invocation

C benchmarks (except as noted below):

icc -m64

482.sphinx3: icc -m32

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
 459.GemsFDTD: -DSPEC_CPU_LP64
 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

Peak Optimization Flags

C benchmarks:

433.milc: -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

470.lbm: -xSSE4.2(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
-ansi-alias -opt-prefetch -static -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2

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

450.soplex: -xSSE4.2(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
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

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: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -static

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: -xSSE4.2 -ipo -O3 -no-prec-div
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes

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Peak Optimization Flags (Continued)

```
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) -unroll4 -auto
-inline-calloc -opt-malloc-options=3
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT
```

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

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.html>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110308.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.xml>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110308.xml>

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