SPEC® CFP2006 Result
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Bull SAS

NovaScale R480 F2 (Intel Xeon X7560, 2.27 GHz)

$SPECfp®_rate2006 = $ 600

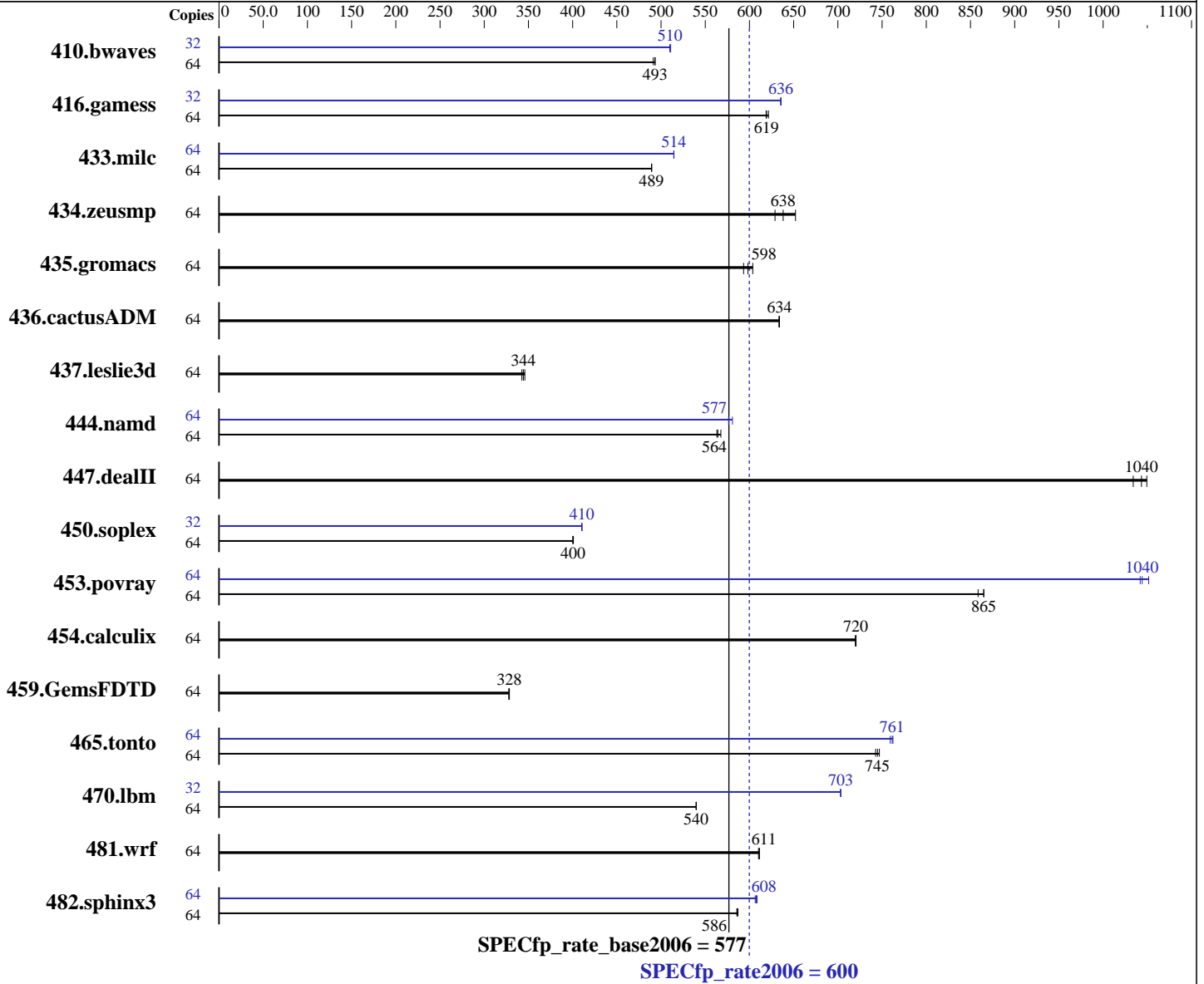$SPECfp_rate_base2006 = $ 577

CPU2006 license: 20
Test sponsor: Bull SAS
Tested by: Dell Inc.

Test date: Apr-2011
Hardware Availability: Jul-2011
Software Availability: Jan-2011

Benchmark	Copies	Result
410.bwaves	32	510
	64	493
416.gamess	32	636
	64	619
433.milc	64	514
	64	489
434.zeusmp	64	638
435.gromacs	64	598
436.cactusADM	64	634
437.leslie3d	64	344
444.namd	64	577
	64	564
447.dealII	64	1040
450.soplex	32	410
	64	400
453.povray	64	1040
	64	865
454.calculix	64	720
459.GemsFDTD	64	328
465.tonto	64	761
	64	745
470.lbm	32	703
	64	540
481.wrf	64	611
482.sphinx3	64	608
	64	586

SPECfp_rate_base2006 = 577

SPECfp_rate2006 = 600

Hardware

CPU Name: Intel Xeon X7560
CPU Characteristics: Intel Turbo Boost Technology up to 2.67 GHz
CPU MHz: 2266
FPU: Integrated
CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip, 2 threads/core
CPU(s) orderable: 2,4 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

Continued on next page

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

Continued on next page

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L3 Cache: 24 MB I+D on chip per chip	Peak Pointers: 32/64-bit
Other Cache: None	Other Software: None
Memory: 512 GB (64 x 8 GB 4Rx8 PC3-8500R-7, ECC)	
Disk Subsystem: 1 x 500 GB 7200 RPM SAS 6Gb	
Other Hardware: None	

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	64	**1764**	**493**	1763	493	1771	491	32	851	511	**852**	**510**	853	510
416.gamess	64	2016	622	**2023**	**619**	2025	619	32	986	636	**986**	**636**	986	635
433.milc	64	1200	489	**1201**	**489**	1201	489	64	1142	514	1142	515	**1142**	**514**
434.zeusmp	64	926	629	893	652	**913**	**638**	64	926	629	893	652	**913**	**638**
435.gromacs	64	757	604	**764**	**598**	770	593	64	757	604	**764**	**598**	770	593
436.cactusADM	64	1208	633	1206	634	**1206**	**634**	64	1208	633	1206	634	**1206**	**634**
437.leslie3d	64	1739	346	1756	343	**1748**	**344**	64	1739	346	1756	343	**1748**	**344**
444.namd	64	904	568	**910**	**564**	911	563	64	**890**	**577**	890	576	884	581
447.dealII	64	698	1050	708	1030	**702**	**1040**	64	698	1050	708	1030	**702**	**1040**
450.soplex	64	1332	401	**1333**	**400**	1334	400	32	650	411	650	410	**650**	**410**
453.povray	64	**394**	**865**	394	865	397	859	64	**326**	**1040**	324	1050	327	1040
454.calculix	64	733	721	**733**	**720**	734	720	64	733	721	**733**	**720**	734	720
459.GemsFDTD	64	2072	328	**2069**	**328**	2067	328	64	2072	328	**2069**	**328**	2067	328
465.tonto	64	848	743	843	747	**846**	**745**	64	829	759	**827**	**761**	826	762
470.lbm	64	1629	540	1629	540	**1629**	**540**	32	**625**	**703**	625	703	625	703
481.wrf	64	**1170**	**611**	1169	611	1172	610	64	**1170**	**611**	1169	611	1172	610
482.sphinx3	64	**2128**	**586**	2125	587	2130	586	64	2049	609	2057	606	**2053**	**608**

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 57600 > /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)
```

General Notes

```
  The Dell PowerEdge R910 and
  the Bull NovaScale R480 F2 models are electronically equivalent.
  The results have been measured on a Dell PowerEdge R910 model.
  Binaries were compiled on RHEL5.5
```

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: `basepeak = yes`

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.20110524.00.html

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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.20110524.00.xml

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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