SPEC® CFP2006 Result
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Bull SAS

NovaScale R480 F2 (Intel Xeon X7560, 2.27 GHz)

$SPECfp^®\_rate2006 =$ 302

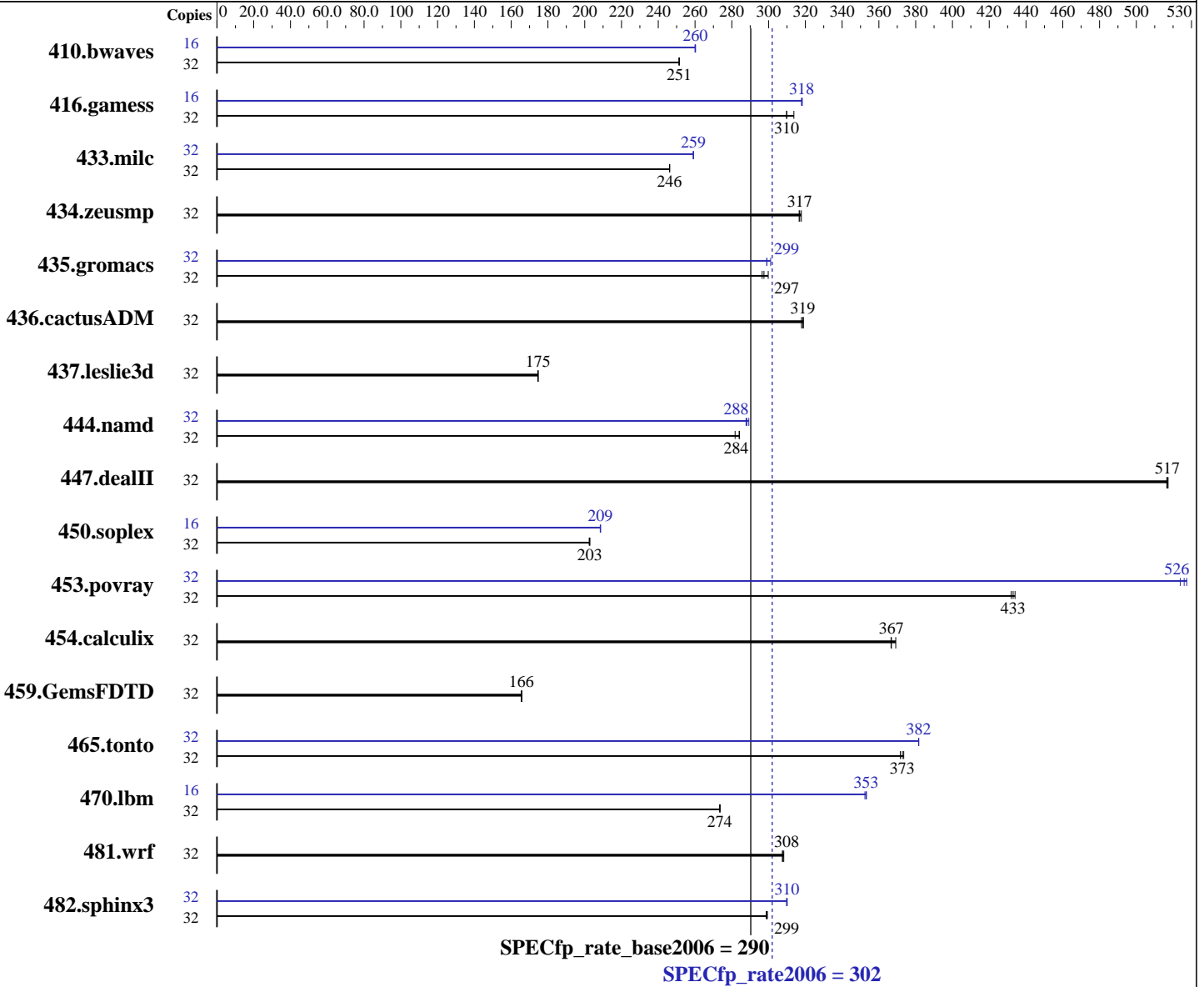$SPECfp\_rate\_base2006 =$ 290

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

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

Copies | 0 20.0 40.0 60.0 80.0 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 530

Benchmark	Copies	Result
410.bwaves	16	260
	32	251
416.gamess	16	318
	32	310
433.milc	32	259
	32	246
434.zeusmp	32	317
435.gromacs	32	299
	32	297
436.cactusADM	32	319
437.leslie3d	32	175
444.namd	32	288
	32	284
447.dealII	32	517
450.soplex	16	209
	32	203
453.povray	32	526
	32	433
454.calculix	32	367
459.GemsFDTD	32	166
465.tonto	32	382
	32	373
470.lbm	16	353
	32	274
481.wrf	32	308
482.sphinx3	32	310
	32	299

SPECfp_rate_base2006 = 290

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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: 16 cores, 2 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

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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 PC3-8500R-7, ECC)
Disk Subsystem:	1 x 500 GB 7200 RPM SAS 6Gb
Other Hardware:	None
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	1729	251	**1730**	**251**	1731	251	16	836	260	**836**	**260**	836	260
416.gamess	32	1997	314	2022	310	**2022**	**310**	16	**985**	**318**	985	318	984	318
433.milc	32	1193	246	1193	246	**1193**	**246**	32	1133	259	**1134**	**259**	1134	259
434.zeusmp	32	**919**	**317**	916	318	920	317	32	**919**	**317**	916	318	920	317
435.gromacs	32	**768**	**297**	771	297	762	300	32	759	301	**764**	**299**	764	299
436.cactusADM	32	**1200**	**319**	1199	319	1203	318	32	**1200**	**319**	1199	319	1203	318
437.leslie3d	32	1722	175	1724	175	**1722**	**175**	32	1722	175	1724	175	**1722**	**175**
444.namd	32	903	284	911	282	**904**	**284**	32	887	289	**890**	**288**	892	288
447.dealII	32	**708**	**517**	709	517	708	517	32	**708**	**517**	709	517	708	517
450.soplex	32	1316	203	1318	202	**1317**	**203**	16	640	209	**640**	**209**	640	208
453.povray	32	**393**	**433**	392	434	394	432	32	325	524	**324**	**526**	323	527
454.calculix	32	715	369	**720**	**367**	720	367	32	715	369	**720**	**367**	720	367
459.GemsFDTD	32	**2050**	**166**	2048	166	2052	165	32	**2050**	**166**	2048	166	2052	165
465.tonto	32	843	374	847	372	**845**	**373**	32	**825**	**382**	825	382	825	382
470.lbm	32	**1608**	**274**	1608	273	1607	274	16	624	352	**623**	**353**	622	353
481.wrf	32	1160	308	**1162**	**308**	1162	308	32	1160	308	**1162**	**308**	1162	308
482.sphinx3	32	**2084**	**299**	2084	299	2088	299	32	**2012**	**310**	2013	310	2011	310

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 28800 > /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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CPU2006 license: 20		**Test date:**	Apr-2011
Test sponsor: Bull SAS		**Hardware Availability:**	Jul-2011
Tested by: Dell Inc.		**Software Availability:**	Jan-2011

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: -xSSE4.2(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

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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Tested with SPEC CPU2006 v1.1.
Report generated on Wed Jul 23 20:23:50 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 24 May 2011.