SPEC® CFP2006 Result
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Bull SAS

NovaScale T820 F3 (Intel Xeon E5-2420, 1.90 GHz)

$SPECfp^®\_rate2006 = \quad 151$

$SPECfp\_rate\_base2006 = \quad 147$
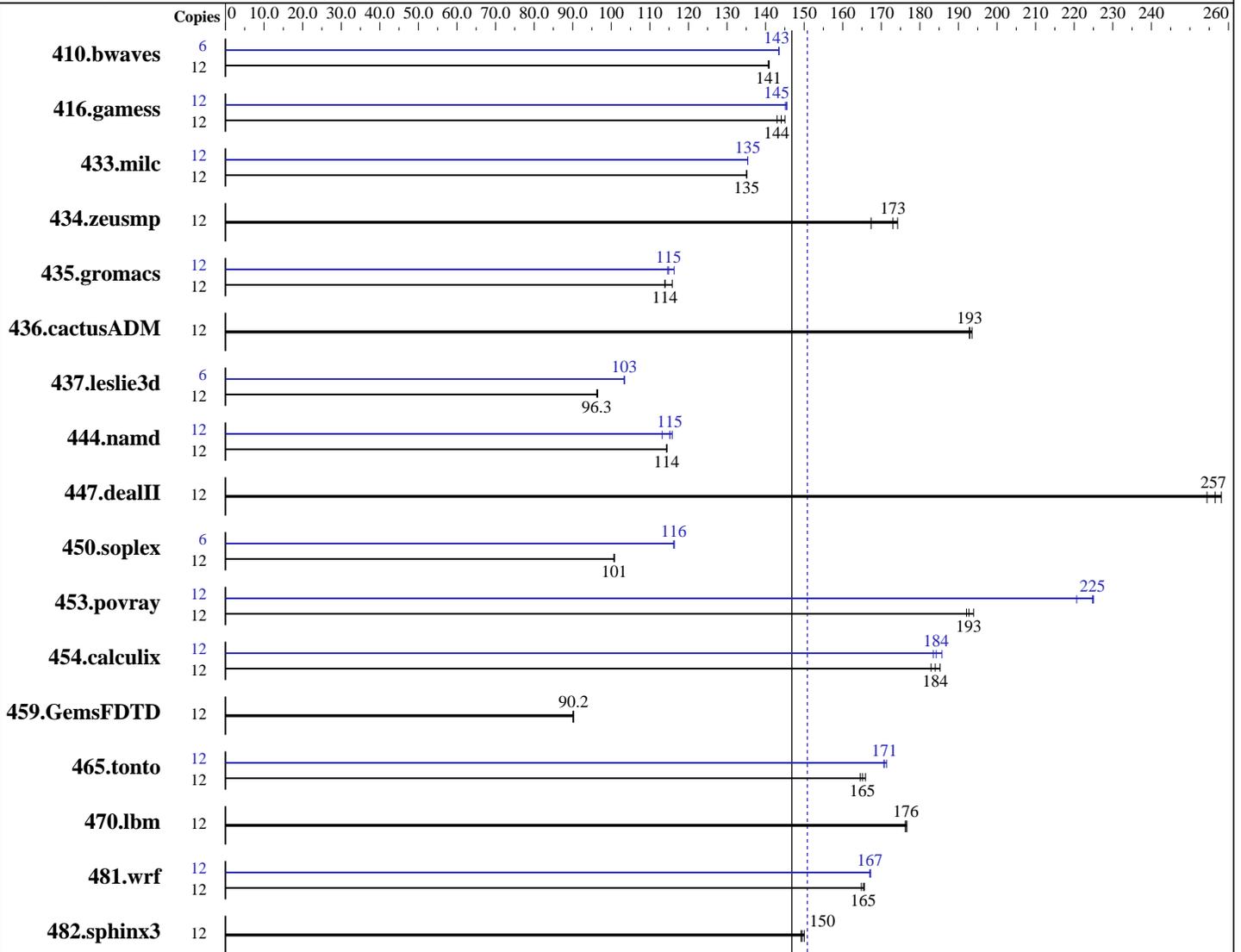
CPU2006 license: 20
Test sponsor: Bull SAS
Tested by: Dell Inc.

Test date: May-2012
Hardware Availability: Jun-2012
Software Availability: Feb-2012

Benchmark	Copies	Result
410.bwaves	6	143
410.bwaves	12	141
416.gamess	12	145
416.gamess	12	144
433.milc	12	135
433.milc	12	135
434.zeusmp	12	173
435.gromacs	12	115
435.gromacs	12	114
436.cactusADM	12	193
437.leslie3d	6	103
437.leslie3d	12	96.3
444.namd	12	115
444.namd	12	114
447.dealII	12	257
450.soplex	6	116
450.soplex	12	101
453.povray	12	225
453.povray	12	193
454.calculix	12	184
454.calculix	12	184
459.GemsFDTD	12	90.2
465.tonto	12	171
465.tonto	12	165
470.lbm	12	176
481.wrf	12	167
481.wrf	12	165
482.sphinx3	12	150

SPECfp_rate_base2006 = 147

SPECfp_rate2006 = 151

Hardware

CPU Name: Intel Xeon E5-2420
CPU Characteristics: Intel Turbo Boost Technology up to 2.40 GHz
CPU MHz: 1900
FPU: Integrated
CPU(s) enabled: 6 cores, 1 chip, 6 cores/chip, 2 threads/core
CPU(s) orderable: 1 chip
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 SP2(x86_64)
3.0.13-0.27-default
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: ext3
System State: Run level 3 (multi-user)

Continued on next page

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L3 Cache:	15 MB I+D on chip per chip	Base Pointers:	32/64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz)	Other Software:	None
Disk Subsystem:	1 x 300 GB 15000 RPM SAS		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	12	**1158**	**141**	1157	141	1159	141	6	568	143	**568**	**143**	569	143
416.gamess	12	1620	145	1643	143	**1631**	**144**	12	**1616**	**145**	1619	145	1614	146
433.milc	12	815	135	**815**	**135**	816	135	12	**814**	**135**	814	135	814	135
434.zeusmp	12	627	174	653	167	**631**	**173**	12	627	174	653	167	**631**	**173**
435.gromacs	12	740	116	752	114	**752**	**114**	12	**746**	**115**	737	116	747	115
436.cactusADM	12	741	194	**743**	**193**	744	193	12	741	194	**743**	**193**	744	193
437.leslie3d	12	1169	96.5	1172	96.2	**1172**	**96.3**	6	**545**	**103**	545	103	546	103
444.namd	12	**842**	**114**	842	114	841	114	12	**836**	**115**	831	116	850	113
447.dealII	12	540	254	532	258	**535**	**257**	12	540	254	532	258	**535**	**257**
450.soplex	12	993	101	994	101	**993**	**101**	6	430	116	**431**	**116**	431	116
453.povray	12	329	194	**331**	**193**	332	192	12	289	221	**284**	**225**	284	225
454.calculix	12	541	183	534	185	**538**	**184**	12	533	186	**537**	**184**	540	184
459.GemsFDTD	12	**1411**	**90.2**	1410	90.3	1414	90.1	12	**1411**	**90.2**	1410	90.3	1414	90.1
465.tonto	12	**715**	**165**	712	166	718	165	12	**691**	**171**	692	171	689	171
470.lbm	12	**935**	**176**	933	177	936	176	12	**935**	**176**	933	177	936	176
481.wrf	12	**811**	**165**	813	165	809	166	12	802	167	801	167	**802**	**167**
482.sphinx3	12	1559	150	1568	149	**1564**	**150**	12	1559	150	1568	149	**1564**	**150**

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

CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost set to Enabled

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Platform Notes (Continued)

```
C States/C1E set to Enabled
Sysinfo program /root/CPU2006-1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on linux-sxkz Wed May 30 01:05:11 2012

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E5-2420 0 @ 1.90GHz
      1 "physical id"s (chips)
      12 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
      cpu cores : 6
      siblings  : 12
      physical 0: cores 0 1 2 3 4 5
   cache size : 15360 KB

From /proc/meminfo
   MemTotal:        49348896 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 11 (x86_64)
      VERSION = 11
      PATCHLEVEL = 2

uname -a:
   Linux linux-sxkz 3.0.13-0.27-default #1 SMP Wed Feb 15 13:33:49 UTC 2012
   (d73692b) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 29 10:00 last=S

SPEC is set to: /root/CPU2006-1.2
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      ext3  271G   40G  218G  16% /

Additional information from dmidecode:

(End of data from sysinfo program)
```

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General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/CPU2006-1.2/libs/32:/root/CPU2006-1.2/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/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>
 The Dell PowerEdge T320 and
 the Bull NovaScale T820 F3 models are electronically equivalent.
 The results have been measured on a Dell PowerEdge T320 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
```

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Base Portability Flags (Continued)

        482.sphinx3: -DSPEC_CPU_LP64

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

Continued on next page

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Peak Portability Flags (Continued)

```
    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: -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
```

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Peak Optimization Flags (Continued)

437.leslie3d: `-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch`

459.GemsFDTD: `basepeak = yes`

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`

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/Intel-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.xml

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

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