



# SPEC<sup>®</sup> CFP2006 Result

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## Dell Inc.

### SPECfp<sup>®</sup>\_rate2006 = 210

### PowerEdge T320 (Intel Xeon E5-2470, 2.30 GHz)

### SPECfp\_rate\_base2006 = 203

CPU2006 license: 55

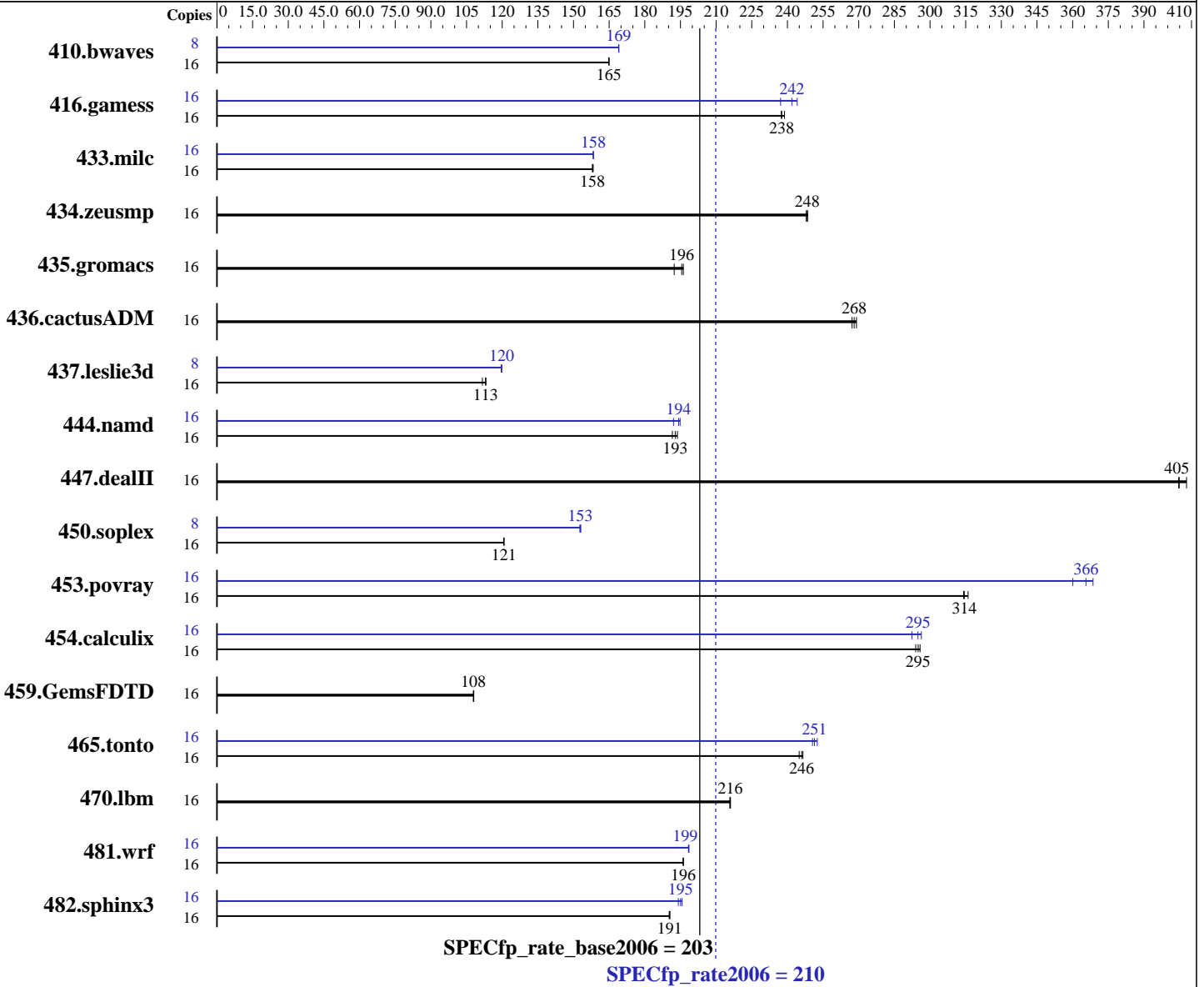
Test date: Apr-2012

Test sponsor: Dell Inc.

Hardware Availability: Jun-2012

Tested by: Dell Inc.

Software Availability: Feb-2012



#### Hardware

CPU Name: Intel Xeon E5-2470  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 1 chip, 8 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

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#### 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)

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L3 Cache: 20 MB I+D on chip per chip  
Other Cache: None  
Memory: 48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
Disk Subsystem: 1 x 300 GB 15000 RPM SAS  
Other Hardware: None

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	16	1318	165	1319	165	<u>1319</u>	<u>165</u>	8	643	169	<u>643</u>	<u>169</u>	643	169
416.gamess	16	1312	239	1319	237	<u>1318</u>	<u>238</u>	16	<u>1295</u>	<u>242</u>	1321	237	1283	244
433.milc	16	928	158	930	158	<u>929</u>	<u>158</u>	16	928	158	<u>928</u>	<u>158</u>	928	158
434.zeusmp	16	587	248	<u>586</u>	<u>248</u>	586	248	16	587	248	<u>586</u>	<u>248</u>	586	248
435.gromacs	16	582	196	594	192	<u>584</u>	<u>196</u>	16	582	196	594	192	<u>584</u>	<u>196</u>
436.cactusADM	16	711	269	716	267	<u>713</u>	<u>268</u>	16	711	269	716	267	<u>713</u>	<u>268</u>
437.leslie3d	16	1347	112	1329	113	<u>1331</u>	<u>113</u>	8	<u>628</u>	<u>120</u>	629	120	628	120
444.namd	16	662	194	670	192	<u>666</u>	<u>193</u>	16	<u>661</u>	<u>194</u>	668	192	659	195
447.dealII	16	452	405	449	408	<u>452</u>	<u>405</u>	16	452	405	449	408	<u>452</u>	<u>405</u>
450.soplex	16	<u>1105</u>	<u>121</u>	1105	121	1106	121	8	<u>436</u>	<u>153</u>	436	153	437	153
453.povray	16	<u>271</u>	<u>314</u>	271	314	269	316	16	236	360	<u>233</u>	<u>366</u>	231	369
454.calculix	16	<u>447</u>	<u>295</u>	446	296	449	294	16	445	296	451	292	<u>448</u>	<u>295</u>
459.GemsFDTD	16	<u>1573</u>	<u>108</u>	1573	108	1571	108	16	<u>1573</u>	<u>108</u>	1573	108	1571	108
465.tonto	16	643	245	639	247	<u>640</u>	<u>246</u>	16	<u>626</u>	<u>251</u>	628	251	623	253
470.lbm	16	<u>1018</u>	<u>216</u>	1017	216	1019	216	16	<u>1018</u>	<u>216</u>	1017	216	1019	216
481.wrf	16	911	196	<u>911</u>	<u>196</u>	911	196	16	901	198	900	199	<u>900</u>	<u>199</u>
482.sphinx3	16	<u>1637</u>	<u>191</u>	1637	191	1639	190	16	1607	194	1593	196	<u>1599</u>	<u>195</u>

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 T320 Fri Apr 20 11:27:38 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 E5-2470 0 @ 2.30GHz
 1 "physical id"s (chips)
 16 "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 : 8
  siblings  : 16
  physical 0: cores 0 1 2 3 4 5 6 7
  cache size : 20480 KB
```

```
From /proc/meminfo
MemTotal:      49381732 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 T320 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 Apr 19 22:11 last=S
```

```
SPEC is set to: /root/CPU2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2        ext3  226G   25G  190G  12% /
```

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.lelie3d: -DSPEC\_CPU\_LP64  
444.namd: -DSPEC\_CPU\_LP64  
447.deallI: -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 (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

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## Peak Portability Flags (Continued)

```

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

```

## 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: -xAVX -ipo -O3 -no-prec-div -unroll2

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

```

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## Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes

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-alloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

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>

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

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