



# SPEC<sup>®</sup> CINT2006 Result

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## Bull SAS

SPECint<sup>®</sup>\_rate2006 = 311

NovaScale R430 F2 (Intel Xeon E5645, 2.40 GHz)

SPECint\_rate\_base2006 = 290

CPU2006 license: 20

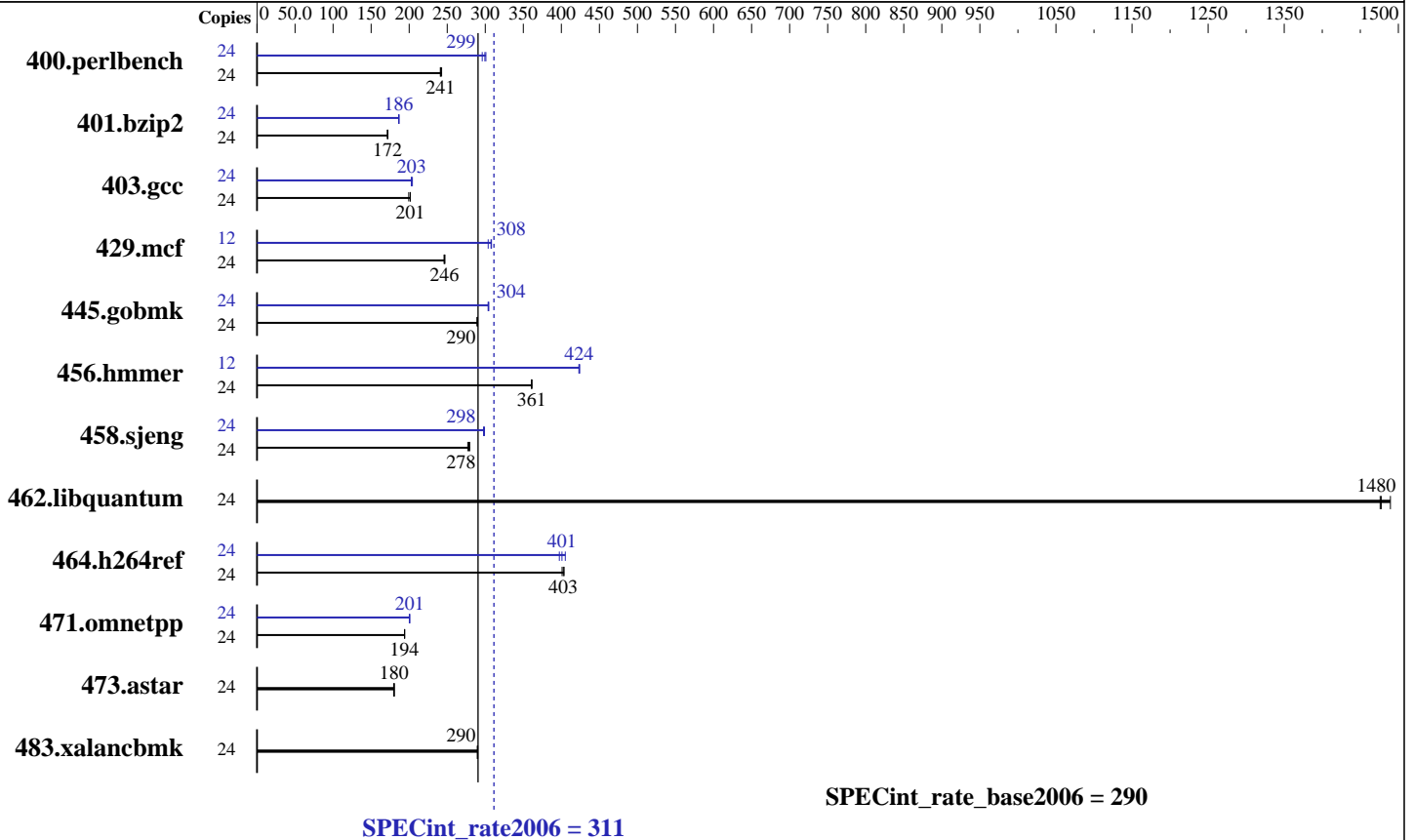
Test date: Apr-2011

Test sponsor: Bull SAS

Hardware Availability: Feb-2011

Tested by: Dell Inc.

Software Availability: Jan-2011



### Hardware

CPU Name: Intel Xeon E5645  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz  
 CPU MHz: 2400  
 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  
 L3 Cache: 12 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 48 GB (6 x 8 GB 2Rx4 PC3-10600R-9, ECC)  
 Disk Subsystem: 1 x 146 GB 15000 RPM SAS  
 Other Hardware: None

### Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86\_64), Kernel 2.6.32.12-0.7-default  
 Compiler: Intel C++ Compiler XE for applications running on IA-32 Version 12.0.1.116 Build 20101116  
 Auto Parallel: No  
 File System: ext3  
 System State: Run level 3 (multi-user)  
 Base Pointers: 32-bit  
 Peak Pointers: 32/64-bit  
 Other Software: Microquill SmartHeap V9.01



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### Results Table

| Benchmark      | Base   |             |            |             |            |            |             | Peak   |            |            |             |            |            |             |
|----------------|--------|-------------|------------|-------------|------------|------------|-------------|--------|------------|------------|-------------|------------|------------|-------------|
|                | Copies | Seconds     | Ratio      | Seconds     | Ratio      | Seconds    | Ratio       | Copies | Seconds    | Ratio      | Seconds     | Ratio      | Seconds    | Ratio       |
| 400.perlbench  | 24     | <u>971</u>  | <u>241</u> | 966         | 243        | 973        | 241         | 24     | <u>783</u> | <u>299</u> | 780         | 301        | 792        | 296         |
| 401.bzip2      | 24     | <u>1350</u> | <u>172</u> | 1352        | 171        | 1346       | 172         | 24     | 1244       | 186        | <u>1243</u> | <u>186</u> | 1240       | 187         |
| 403.gcc        | 24     | <u>959</u>  | <u>201</u> | 959         | 201        | 969        | 199         | 24     | <u>951</u> | <u>203</u> | 946         | 204        | 953        | 203         |
| 429.mcf        | 24     | 886         | 247        | <u>888</u>  | <u>246</u> | 890        | 246         | 12     | <u>356</u> | <u>308</u> | 360         | 304        | 355        | 308         |
| 445.gobmk      | 24     | 871         | 289        | 868         | 290        | <u>868</u> | <u>290</u>  | 24     | 827        | 304        | 829         | 304        | <u>827</u> | <u>304</u>  |
| 456.hammer     | 24     | 621         | 361        | 620         | 361        | <u>621</u> | <u>361</u>  | 12     | 264        | 424        | <u>264</u>  | <u>424</u> | 265        | 423         |
| 458.sjeng      | 24     | <u>1043</u> | <u>278</u> | 1039        | 280        | 1048       | 277         | 24     | <u>974</u> | <u>298</u> | 971         | 299        | 975        | 298         |
| 462.libquantum | 24     | 334         | 1490       | 337         | 1480       | <u>337</u> | <u>1480</u> | 24     | 334        | 1490       | 337         | 1480       | <u>337</u> | <u>1480</u> |
| 464.h264ref    | 24     | 1316        | 404        | <u>1319</u> | <u>403</u> | 1325       | 401         | 24     | 1337       | 397        | <u>1325</u> | <u>401</u> | 1311       | 405         |
| 471.omnetpp    | 24     | <u>773</u>  | <u>194</u> | 774         | 194        | 773        | 194         | 24     | <u>748</u> | <u>201</u> | 749         | 200        | 747        | 201         |
| 473.astar      | 24     | 938         | 180        | 933         | 181        | <u>935</u> | <u>180</u>  | 24     | 938        | 180        | 933         | 181        | <u>935</u> | <u>180</u>  |
| 483.xalancbmk  | 24     | 572         | 290        | 571         | 290        | <u>571</u> | <u>290</u>  | 24     | 572        | 290        | 571         | 290        | <u>571</u> | <u>290</u>  |

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
```

### Platform Notes

BIOS Settings:  
Power Management = Maximum Performance (Default = Active Power Controller)  
Data Reuse = Disabled (Default = Enabled)

### General Notes

Binaries were compiled on RHEL5.5  
The Dell PowerEdge R410 and  
the Bull NovaScale R430 F2 models are electronically equivalent.  
The results have been measured on a Dell PowerEdge R410 model.



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## Base Compiler Invocation

C benchmarks:  
icc -m32

C++ benchmarks:  
icpc -m32

## Base Portability Flags

400.perlbench: -DSPEC\_CPU\_LINUX\_IA32  
462.libquantum: -DSPEC\_CPU\_LINUX  
483.xalancbmk: -DSPEC\_CPU\_LINUX

## Base Optimization Flags

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

C++ benchmarks:  
-xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs  
-L/smartheap -lsmartheap  
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

## Base Other Flags

C benchmarks:  
403.gcc: -Dalloca=\_alloca

## Peak Compiler Invocation

C benchmarks (except as noted below):  
icc -m32

400.perlbench: icc -m64

401.bzip2: icc -m64

456.hmmer: icc -m64

458.sjeng: icc -m64

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## Peak Compiler Invocation (Continued)

C++ benchmarks:  
icpc -m32

## Peak Portability Flags

400.perlbench: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX\_X64  
401.bzip2: -DSPEC\_CPU\_LP64  
456.hmmer: -DSPEC\_CPU\_LP64  
458.sjeng: -DSPEC\_CPU\_LP64  
462.libquantum: -DSPEC\_CPU\_LINUX  
483.xalancbmk: -DSPEC\_CPU\_LINUX

## Peak Optimization Flags

C benchmarks:

400.perlbench: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

401.bzip2: -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 -auto-ilp32 -ansi-alias  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

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

429.mcf: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-ansi-alias -auto-ilp32

445.gobmk: -xSSE4.2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)  
-ansi-alias -auto-ilp32

456.hmmer: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

458.sjeng: -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-ilp32  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

462.libquantum: basepeak = yes

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## Peak Optimization Flags (Continued)

464.h264ref: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-unroll2 -ansi-alias

C++ benchmarks:

471.omnetpp: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs  
-L/smartheap -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

## Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=\_alloca

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>

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

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