# SPEC® CINT2006 Result

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## IBM Corporation

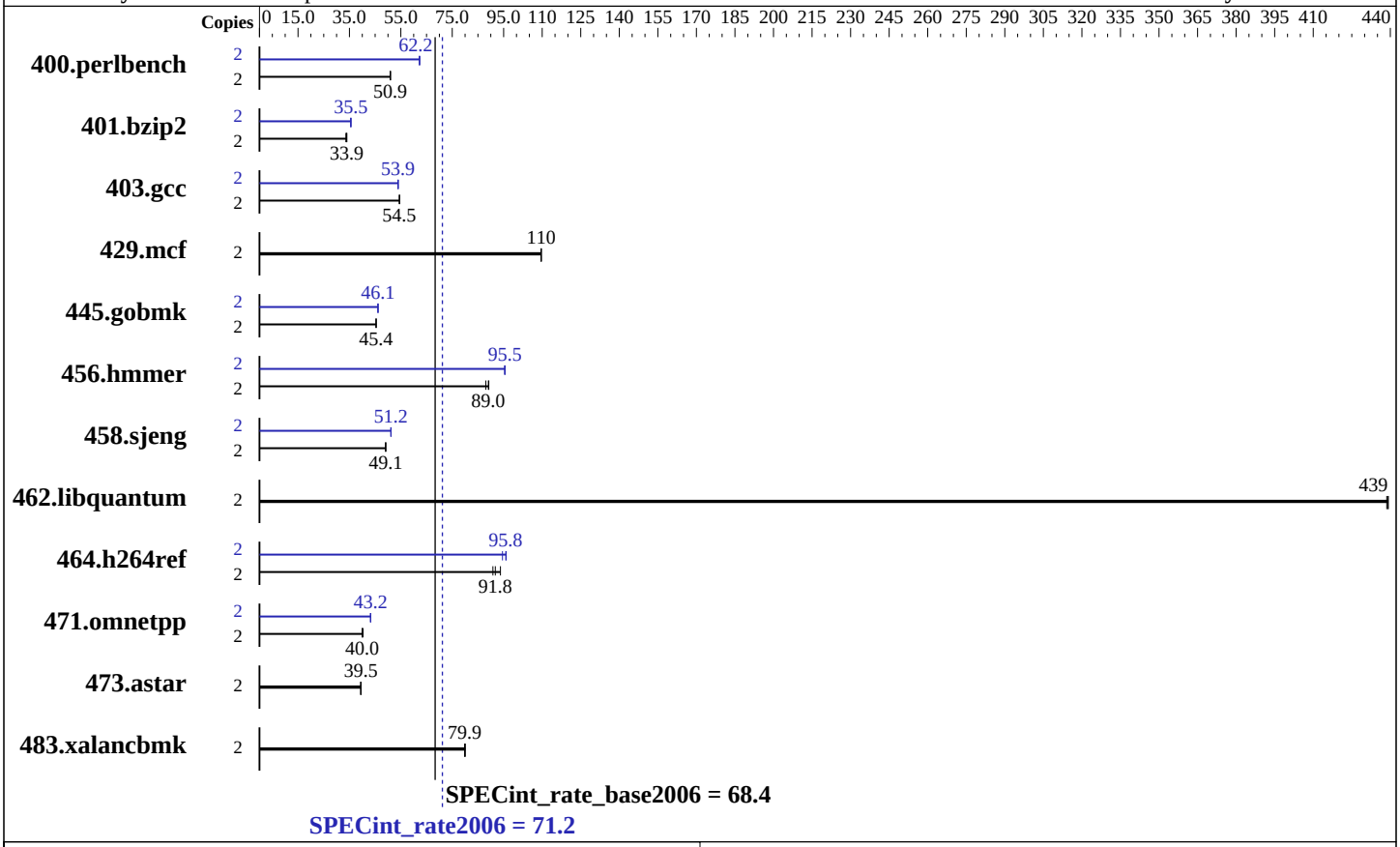
IBM System x3100 M4
(Intel Pentium G870, 3.10 GHz)

SPECint®_rate2006 = 71.2

SPECint_rate_base2006 = 68.4

**CPU2006 license:** 11
**Test sponsor:** IBM Corporation
**Tested by:** IBM Corporation

**Test date:** Sep-2012
**Hardware Availability:** May-2012
**Software Availability:** Dec-2011




### Hardware

| | |
|---|---|
| CPU Name: | Intel Pentium G870 |
| CPU Characteristics: | |
| CPU MHz: | 3100 |
| FPU: | Integrated |
| CPU(s) enabled: | 2 cores, 1 chip, 2 cores/chip |
| 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 |
| L3 Cache: | 3 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 16 GB (2 x 8 GB 2Rx8 PC3-12800E-11, ECC, running at 1333 MHz) |
| Disk Subsystem: | 1 x 250 GB SATA, 7200 RPM |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 6.2 (Santiago)<br>2.6.32-220.el6.x86_64 |
| Compiler: | C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux |
| Auto Parallel: | No |
| File System: | ext4 |
| 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 | 2 | 384 | 50.9 | **384** | **50.9** | 384 | 51.0 | 2 | 314 | 62.2 | **314** | **62.2** | 313 | 62.4 |
| 401.bzip2 | 2 | **569** | **33.9** | 568 | 34.0 | 574 | 33.6 | 2 | 544 | 35.5 | 542 | 35.6 | **543** | **35.5** |
| 403.gcc | 2 | **296** | **54.5** | 296 | 54.5 | 296 | 54.5 | 2 | 299 | 53.9 | 298 | 54.0 | **299** | **53.9** |
| 429.mcf | 2 | **166** | **110** | 166 | 110 | 166 | 110 | 2 | **166** | **110** | 166 | 110 | 166 | 110 |
| 445.gobmk | 2 | 462 | 45.4 | **462** | **45.4** | 462 | 45.4 | 2 | **455** | **46.1** | 455 | 46.1 | 455 | 46.1 |
| 456.hmmer | 2 | **210** | **89.0** | 212 | 88.1 | 209 | 89.2 | 2 | 196 | 95.4 | 195 | 95.5 | **195** | **95.5** |
| 458.sjeng | 2 | 493 | 49.1 | 493 | 49.1 | **493** | **49.1** | 2 | 473 | 51.2 | **473** | **51.2** | 473 | 51.1 |
| 462.libquantum | 2 | 94.3 | 439 | **94.4** | **439** | 94.5 | 439 | 2 | 94.3 | 439 | **94.4** | **439** | 94.5 | 439 |
| 464.h264ref | 2 | 487 | 90.8 | **482** | **91.8** | 472 | 93.8 | 2 | **462** | **95.8** | 461 | 96.0 | 468 | 94.5 |
| 471.omnetpp | 2 | 310 | 40.3 | **312** | **40.0** | 313 | 39.9 | 2 | 289 | 43.3 | **289** | **43.2** | 289 | 43.2 |
| 473.astar | 2 | 356 | 39.5 | 357 | 39.4 | **356** | **39.5** | 2 | 356 | 39.5 | 357 | 39.4 | **356** | **39.5** |
| 483.xalancbmk | 2 | 173 | 79.8 | **173** | **79.9** | 172 | 80.1 | 2 | 173 | 79.8 | **173** | **79.9** | 172 | 80.1 |

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

```
BIOS Settings:
Turbo Mode enabled in BIOS
C-State enabled in BIOS
Sysinfo program /root/SPECcpu1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on localhost.localdomain Fri Sep 14 16:17:00 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) Pentium(R) CPU G870 @ 3.10GHz
      1 "physical id"s (chips)
      2 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
```

Continued on next page

## Platform Notes (Continued)

```
      caution.)
         cpu cores : 2
         siblings  : 2
         physical 0: cores 0 1
      cache size : 3072 KB

   From /proc/meminfo
      MemTotal:       16322724 kB
      HugePages_Total:       0
      Hugepagesize:       2048 kB

   /usr/bin/lsb_release -d
      Red Hat Enterprise Linux Server release 6.2 (Santiago)

   From /etc/*release* /etc/*version*
      redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
      system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
      system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

   uname -a:
      Linux localhost.localdomain 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13
      EST 2011 x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 Sep 14 16:11

   SPEC is set to: /root/SPECcpu1.2
      Filesystem     Type    Size  Used Avail Use% Mounted on
      /dev/mapper/VolGroup-lv_root
                     ext4     50G   26G   22G  55% /

   Additional information from dmidecode:
     Memory:
      2x Micron 18JSF1G72AZ-1G6D1 8 GB 1333 MHz 2 rank

   (End of data from sysinfo program)
```

## General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/root/SPECcpu1.2/libs/32:/root/SPECcpu1.2/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/redhat_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>
```

## 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 -opt-mem-layout-trans=3

C++ benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -opt-mem-layout-trans=3
-Wl,-z,muldefs -L/smartheap -lsmartheap

## 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

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) -auto-ilp32

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

403.gcc: -xSSE4.2 -ipo -O3 -no-prec-div

429.mcf: basepeak = yes

445.gobmk: -xSSE4.2(pass 2) -prof-gen(pass 1) -prof-use(pass 2) -ansi-alias -opt-mem-layout-trans=3

456.hmmer: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

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

462.libquantum: basepeak = yes

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

Continued on next page

## Peak Optimization Flags (Continued)

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-ic12.1-official-linux64.20111122.html`
`http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.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/IBM-Platform-Flags-V1.2-IVB-A.xml`


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For other inquiries, please contact webmaster@spec.org.

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