# SPEC® CINT2006 Result
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## IBM Corporation

IBM System x3950 X6
(Intel Xeon E7-8880L v2, 2.20 GHz)

$SPECint^®\_rate2006 = \quad 3940$

$SPECint\_rate\_base2006 = \quad 3830$

| **CPU2006 license:** 11 | **Test date:** May-2014 |
|---|---|
| **Test sponsor:** IBM Corporation | **Hardware Availability:** Jun-2014 |
| **Tested by:** IBM Corporation | **Software Availability:** Nov-2013 |



SPECint_rate_base2006 = 3830

SPECint_rate2006 = 3940

### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-8880L v2 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.80 GHz |
| CPU MHz: | 2200 |
| FPU: | Integrated |
| CPU(s) enabled: | 120 cores, 8 chips, 15 cores/chip, 2 threads/core |
| CPU(s) orderable: | 4,6,8 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: | 37.5 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 2 TB (128 x 16 GB 2Rx4 PC3L-12800R-11, ECC, running at 1333 MHz) |
| Disk Subsystem: | 1 x 400 GB SATA, SSD |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 6.5 (Santiago) 2.6.32-431.el6.x86_64 |
| Compiler: | C/C++: Version 14.0.0.080 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 V10.0 |

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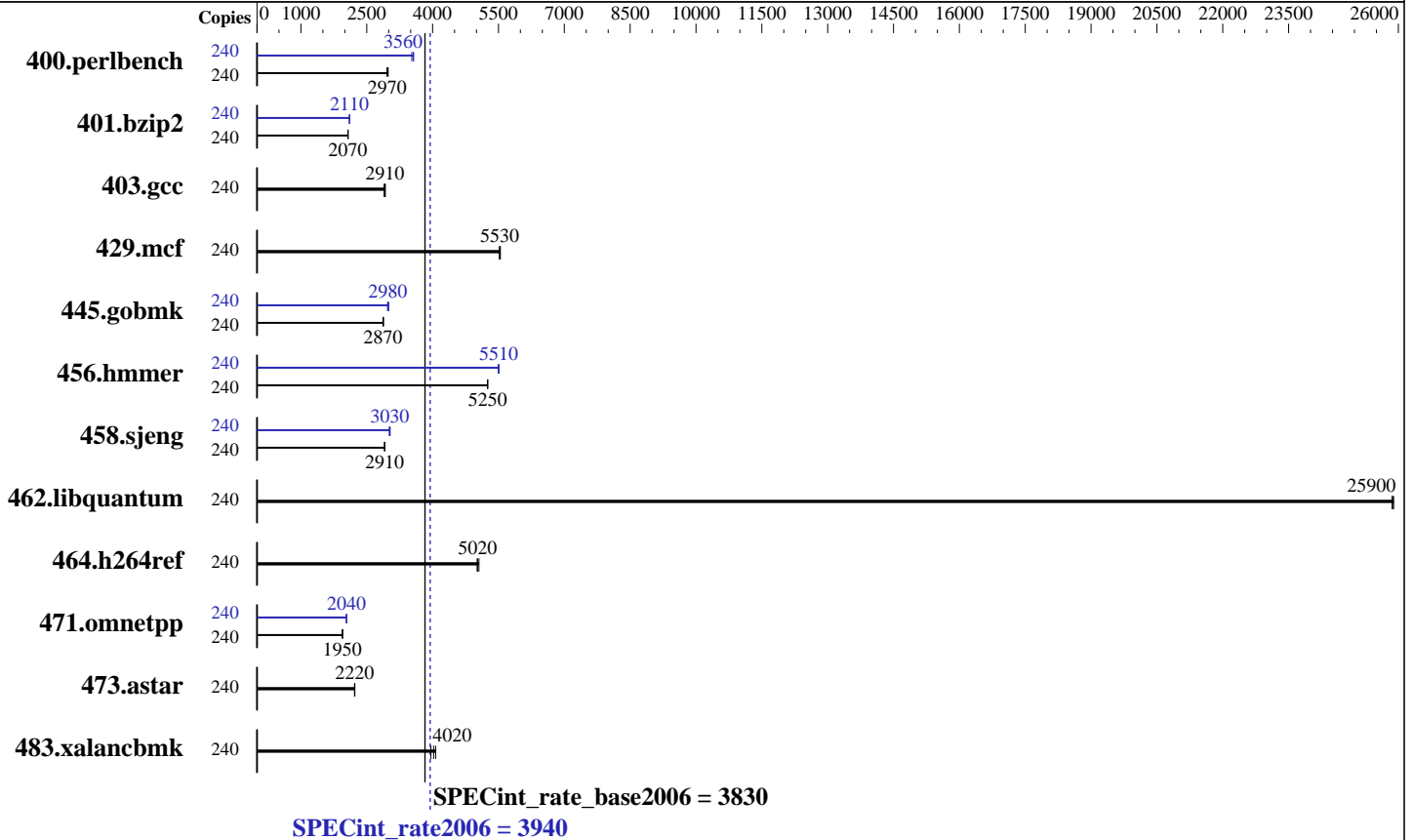## Results Table

| Benchmark | Base | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 240 | 785 | 2990 | 792 | 2960 | **790** | **2970** | 240 | 665 | 3530 | **659** | **3560** | 657 | 3570 |
| 401.bzip2 | 240 | 1118 | 2070 | 1115 | 2080 | **1118** | **2070** | 240 | 1099 | 2110 | 1100 | 2110 | **1100** | **2110** |
| 403.gcc | 240 | **663** | **2910** | 661 | 2920 | 667 | 2900 | 240 | **663** | **2910** | 661 | 2920 | 667 | 2900 |
| 429.mcf | 240 | 396 | 5520 | **396** | **5530** | 395 | 5540 | 240 | 396 | 5520 | **396** | **5530** | 395 | 5540 |
| 445.gobmk | 240 | **876** | **2870** | 873 | 2880 | 878 | 2870 | 240 | **844** | **2980** | 846 | 2970 | 839 | 3000 |
| 456.hmmer | 240 | 426 | 5250 | **426** | **5250** | 426 | 5250 | 240 | 407 | 5500 | 406 | 5510 | **406** | **5510** |
| 458.sjeng | 240 | 999 | 2910 | **999** | **2910** | 999 | 2910 | 240 | **959** | **3030** | 964 | 3010 | 958 | 3030 |
| 462.libquantum | 240 | **192** | **25900** | 192 | 25900 | 192 | 25900 | 240 | **192** | **25900** | 192 | 25900 | 192 | 25900 |
| 464.h264ref | 240 | 1059 | 5020 | **1057** | **5020** | 1050 | 5060 | 240 | 1059 | 5020 | **1057** | **5020** | 1050 | 5060 |
| 471.omnetpp | 240 | 771 | 1950 | **770** | **1950** | 770 | 1950 | 240 | 736 | 2040 | 737 | 2040 | **736** | **2040** |
| 473.astar | 240 | 756 | 2230 | 758 | 2220 | **758** | **2220** | 240 | 756 | 2230 | 758 | 2220 | **758** | **2220** |
| 483.xalancbmk | 240 | 418 | 3960 | **412** | **4020** | 407 | 4070 | 240 | 418 | 3960 | **412** | **4020** | 407 | 4070 |

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

    Operating Mode set to Maximum Perfomance in BIOS
    Memory Data Scrambling Disabled
    Patrol Scrub Disabled
    Sysinfo program /cpu2006.1.2_14_aug2013/config/sysinfo.rev6818
    $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
    running on x3950x6 Thu May 29 22:22:33 2014

    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 E7-8880L v2 @ 2.20GHz
          8 "physical id"s (chips)
          240 "processors"
       cores, siblings (Caution: counting these is hw and system dependent.  The
       following excerpts from /proc/cpuinfo might not be reliable.  Use with

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## Platform Notes (Continued)

```
   caution.)
      cpu cores : 15
      siblings  : 30
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 4: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 5: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 6: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 7: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
   cache size : 38400 KB

 From /proc/meminfo
    MemTotal:     2117446648 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 /usr/bin/lsb_release -d
    Red Hat Enterprise Linux Server release 6.5 (Santiago)

 From /etc/*release* /etc/*version*
    redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
    system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

 uname -a:
    Linux x3950x6 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 May 29 22:18

 SPEC is set to: /cpu2006.1.2_14_aug2013
    Filesystem                    Type  Size  Used Avail Use% Mounted on
    /dev/mapper/vg_x3950x6-lv_root ext4  357G  8.5G  330G   3% /

 Additional information from dmidecode:
   BIOS IBM -[A8E107JUS-1.00]- 05/02/2014
   Memory:
    64x Hynix HMT42GR7AFR4A-PB 16 GB 1333 MHz 2 rank
    64x NO DIMM Unknown
    64x Samsung M393B2G70QH0-YK0 16 GB 1333 MHz 2 rank

 (End of data from sysinfo program)
Memory speed from dmidecode lists the downclocked speed of the run.
```

## General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/cpu2006.1.2_14_aug2013/libs/32:/cpu2006.1.2_14_aug2013/libs/64:/cpu2006.1.2_14_aug2013/sh"
```

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## General Notes (Continued)

```
Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
memory using RedHat EL 6.4
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/sh -lsmartheap

## Base Other Flags

C benchmarks:

    403.gcc: -Dalloca=_alloca

## Peak Compiler Invocation

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

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# Peak Compiler Invocation (Continued)

```
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: basepeak = yes

   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
```

Continued on next page

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# Peak Optimization Flags (Continued)

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

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/sh -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-ic14.0-official-linux64.20140128.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-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.xml

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

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