# SPEC® CINT2006 Result

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## NEC Corporation

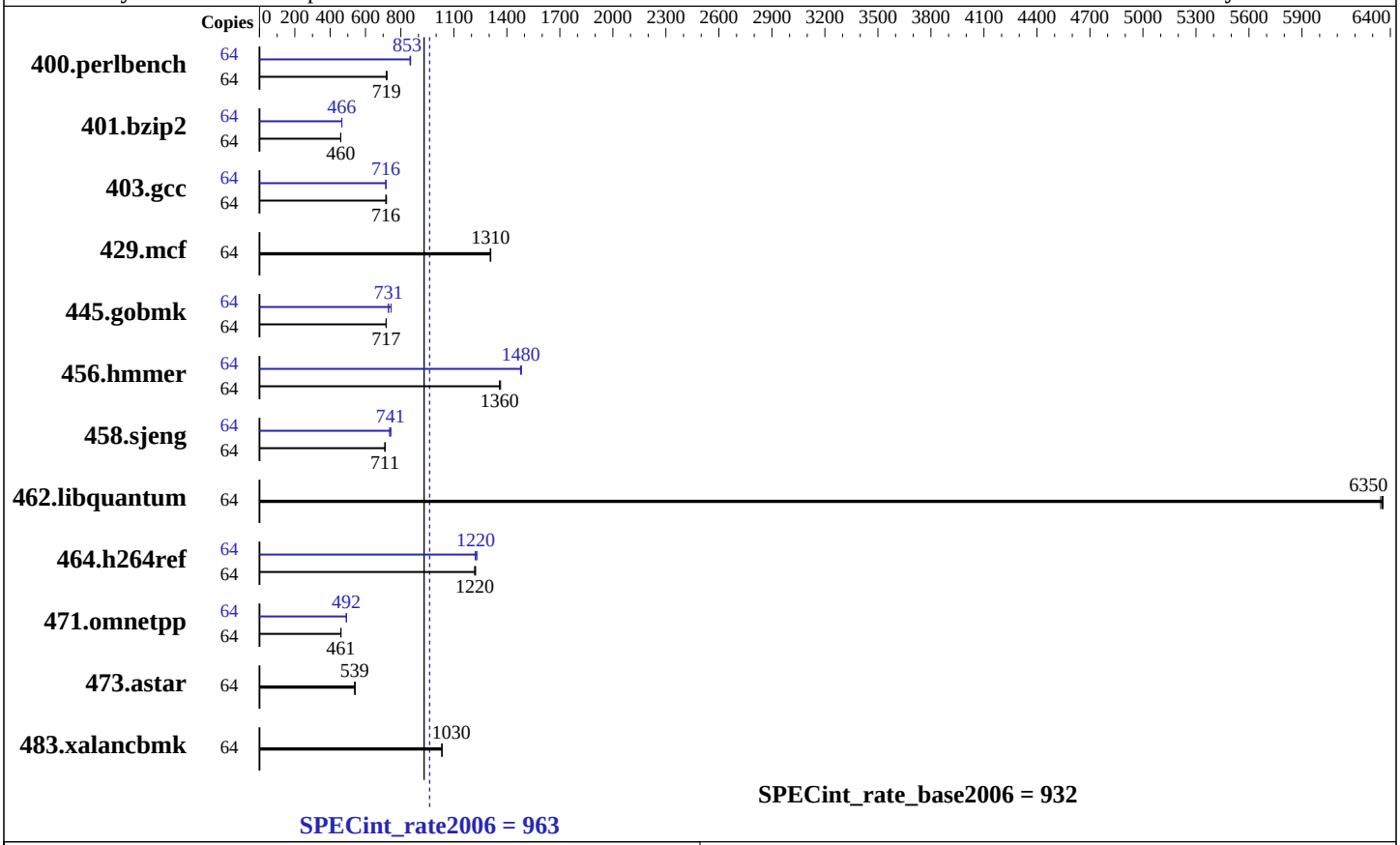
## Express5800/A2040b (Intel Xeon E7-4820 v2)

**SPECint®_rate2006 = 963**

**SPECint_rate_base2006 = 932**

**CPU2006 license:** 9006
**Test sponsor:** NEC Corporation
**Tested by:** NEC Corporation

**Test date:** Oct-2014
**Hardware Availability:** Mar-2014
**Software Availability:** Oct-2013




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-4820 v2 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.50 GHz |
| CPU MHz: | 2000 |
| FPU: | Integrated |
| CPU(s) enabled: | 32 cores, 4 chips, 8 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2,3,4 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: | 16 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 1 TB (64 x 16 GB 2Rx4 PC3L-12800R-11, ECC, running at 1066 MHz and CL7) |
| Disk Subsystem: | 1 x 300 GB SAS, 10000 RPM |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 6.4 (Santiago)<br>Kernel 2.6.32-358.23.2.el6.x86_64 |
| Compiler: | C/C++: Version 14.0.1.106 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 Multi-Core V10.01 |

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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 | 64 | 872 | 717 | 866 | 722 | **869** | **719** | 64 | **733** | **853** | 731 | 856 | 733 | 853 |
| 401.bzip2 | 64 | 1342 | 460 | 1344 | 459 | **1342** | **460** | 64 | 1326 | 466 | 1325 | 466 | **1325** | **466** |
| 403.gcc | 64 | 720 | 716 | **720** | **716** | 717 | 719 | 64 | **720** | **716** | 721 | 715 | 719 | 716 |
| 429.mcf | 64 | 446 | 1310 | **446** | **1310** | 447 | 1310 | 64 | 446 | 1310 | **446** | **1310** | 447 | 1310 |
| 445.gobmk | 64 | 936 | 717 | 937 | 716 | **936** | **717** | 64 | 920 | 730 | **919** | **731** | 901 | 745 |
| 456.hmmer | 64 | 439 | 1360 | 438 | 1360 | **439** | **1360** | 64 | 403 | 1480 | **404** | **1480** | 404 | 1480 |
| 458.sjeng | 64 | 1091 | 710 | 1089 | 711 | **1090** | **711** | 64 | 1042 | 743 | **1045** | **741** | 1052 | 736 |
| 462.libquantum | 64 | 209 | 6350 | 209 | 6360 | **209** | **6350** | 64 | 209 | 6350 | 209 | 6360 | **209** | **6350** |
| 464.h264ref | 64 | **1161** | **1220** | 1158 | 1220 | 1163 | 1220 | 64 | 1160 | 1220 | **1157** | **1220** | 1151 | 1230 |
| 471.omnetpp | 64 | 867 | 461 | **868** | **461** | 869 | 460 | 64 | **813** | **492** | 814 | 492 | 812 | 492 |
| 473.astar | 64 | **833** | **539** | 833 | 539 | 830 | 541 | 64 | **833** | **539** | 833 | 539 | 830 | 541 |
| 483.xalancbmk | 64 | **428** | **1030** | 428 | 1030 | 428 | 1030 | 64 | **428** | **1030** | 428 | 1030 | 428 | 1030 |

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"
Zone reclaim mode enabled with:
echo 1 > /proc/sys/vm/zone_reclaim_mode
```

## Platform Notes

```
BIOS Settings:
 Memory RAS Mode: Independent mode
```

## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/opt/SmartHeap_10mc/lib:/opt/SmartHeap_10mc/lib64:/opt/intel/composer_xe_2013_sp1.1.106/compiler/lib/ia32:/opt/intel/composer_xe_2013_sp1.1.106/compiler/lib/intel64"

 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/opt/SmartHeap_10mc/lib -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/opt/SmartHeap_10mc/lib -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-ic14.0-official-linux64.20140128.html`
`http://www.spec.org/cpu2006/flags/NEC-platform-Settings-V1.2-A2040b-RevA.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/NEC-platform-Settings-V1.2-A2040b-RevA.xml`


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

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