# SPEC® CINT2006 Result

## NEC Corporation

**Express5800/R120e-2M (Intel Xeon E5-2640 v2)**

<table>
<thead>
<tr>
<th>SPECint®2006</th>
<th>42.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_base2006</td>
<td>40.0</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon E5-2640 v2  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 2.50 GHz  
- **CPU MHz:** 2000  
- **FPU:** Integrated  
- **CPU(s) enabled:** 16 cores, 2 chips, 8 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:** 20 MB I+D on chip per core  
- **Other Cache:** None  
- **Memory:** 256 GB (16 x 16 GB 2Rx4 PC3L-12800R-11, ECC)  
- **Disk Subsystem:** 1 x 300 GB SAS, 10000 RPM, RAID 0  
- **Other Hardware:** None

### Software

- **Operating System:** Red Hat Enterprise Linux Server release 6.4 (Santiago)  
- **Compiler:** C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux  
- **Auto Parallel:** Yes  
- **File System:** ext4  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 32/64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other Software:** Microquill SmartHeap V8.1

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**Test sponsor:** NEC Corporation  
**Test date:** Nov-2013  
**Hardware Availability:** Sep-2013  
**Software Availability:** Sep-2013  
**CPU2006 license:** 9006  
**Tested by:** NEC Corporation

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0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400

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`SPECint_base2006 = 40.0`
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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
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<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>400.perlbench</td>
<td>411</td>
<td>23.8</td>
<td>411</td>
<td>23.8</td>
<td>345</td>
<td>28.3</td>
<td>345</td>
<td>28.3</td>
<td>346</td>
<td>28.3</td>
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<tr>
<td>401.bzip2</td>
<td>564</td>
<td>17.1</td>
<td>564</td>
<td>17.1</td>
<td>557</td>
<td>17.3</td>
<td>557</td>
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<tr>
<td>403.gcc</td>
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<td>25.2</td>
<td>315</td>
<td>25.6</td>
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<td>25.6</td>
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<tr>
<td>429.mcf</td>
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<td>51.9</td>
<td>175</td>
<td>52.0</td>
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<td>51.9</td>
<td>178</td>
<td>51.2</td>
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<tr>
<td>445.gobmk</td>
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<td>579</td>
<td>18.1</td>
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<td>19.7</td>
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<td>19.7</td>
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<tr>
<td>456.hmmer</td>
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<tr>
<td>462.libquantum</td>
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<tr>
<td>464.h264ref</td>
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<td>35.0</td>
<td>632</td>
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<tr>
<td>471.omnetpp</td>
<td>269</td>
<td>23.2</td>
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<td>23.2</td>
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<td>32.8</td>
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<tr>
<td>473.astar</td>
<td>307</td>
<td>22.8</td>
<td>308</td>
<td>22.8</td>
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<td>22.9</td>
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<tr>
<td>483.xalancbmk</td>
<td>168</td>
<td>41.1</td>
<td>169</td>
<td>40.9</td>
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<td>41.2</td>
<td>167</td>
<td>41.3</td>
<td>167</td>
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</tr>
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</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Operating System Notes

- **Stack size set to unlimited using **ulimit -s unlimited**

### Platform Notes

- BIOS Settings:
  - Energy Performance: Performance
  - Memory Voltage: 1.5 V

### General Notes

- Environment variables set by runspec before the start of the run:
  - KMP_AFFINITY = "granularity=fine,compact,1,0"
  - LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"
  - OMP_NUM_THREADS = "16"

- Transparent Huge Pages enabled with:
  - echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled

- The Express5800/R120e-1M and the Express5800/R120e-2M models are electronically equivalent.
- The results have been measured on the Express5800/R120e-2M model.

### Base Compiler Invocation

- C benchmarks:
  - **icc -m64**

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<td>C++ benchmarks:</td>
<td>icpc -m64</td>
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### Base Compiler Invocation (Continued)

#### Base Portability Flags

- 400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
- 401.bzip2: -DSPEC_CPU_LP64
- 429.mcf: -DSPEC_CPU_LP64
- 445.gobmk: -DSPEC_CPU_LP64
- 456.hmmer: -DSPEC_CPU_LP64
- 458.sjeng: -DSPEC_CPU_LP64
- 462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
- 464.h264ref: -DSPEC_CPU_LP64
- 471.omnetpp: -DSPEC_CPU_LP64
- 473.astar: -DSPEC_CPU_LP64
- 483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

#### Base Optimization Flags

- C benchmarks: -xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32
- C++ benchmarks: -xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -Wl,-z,muldefs -L/sh -lsmartheap64

#### Base Other Flags

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

### Peak Compiler Invocation

- C benchmarks (except as noted below):
  - icc -m64
  - 400.perlbench: icc -m32
  - 445.gobmk: icc -m32

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Peak Compiler Invocation (Continued)

464.h264ref: icc -m32

C++ benchmarks (except as noted below):
icpc -m32

473.astar: icpc -m64

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -opt-prefetch
-ansi-alias

401.bzip2: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div -prof-use(pass 2) -auto-ilp32 -opt-prefetch
-ansi-alias

403.gcc: -xAVX -ipo -O3 -no-prec-div -inline-calloc
-opt-malloc-options=3 -auto-ilp32

429.mcf: basepeak = yes

445.gobmk: -xAVX(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
-ansi-alias

456.hmmer: basepeak = yes

458.sjeng: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4

462.libquantum: basepeak = yes

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Peak Optimization Flags (Continued)

464.h264ref: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-ano-prec-div(pass 2) -prof-use(pass 2) -unroll2
-ansi-alias

C++ benchmarks:

471.omnetpp: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-ano-prec-div(pass 2) -prof-use(pass 2)
-opt-ra-region-strategy=block -ansi-alias
-0L,-z,muldefs -L/sh -lsmartheap

473.astar: basepeak = yes

483.xalanchmk: -xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
-0L,-z,muldefs -L/sh -lsmartheap

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-R120d-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-R120d-RevA.xml

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