## NEC Corporation

### Express5800/E120g-M (Intel Xeon E5-2609 v4)

<table>
<thead>
<tr>
<th>Software</th>
<th>SPECfp®2006 = 76.0</th>
<th>SPECfp_base2006 = 73.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon E5-2609 v4</td>
<td></td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>1700</td>
<td></td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
<td></td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>16 cores, 2 chips, 8 cores/chip</td>
<td></td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chips</td>
<td></td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
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</tr>
<tr>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per core</td>
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</tr>
<tr>
<td>Operating System:</td>
<td>Red Hat Enterprise Linux Server release 7.2 (Maipo)</td>
<td></td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux</td>
<td></td>
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<tr>
<td>Auto Parallel:</td>
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<td></td>
</tr>
<tr>
<td>File System:</td>
<td>ext4</td>
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</tbody>
</table>

| Test date: | Mar-2016 |
| Hardware Availability: | Apr-2016 |
| Software Availability: | Nov-2015 |

### SPECfp Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp_base2006</th>
<th>SPECfp2006</th>
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</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>22.8</td>
<td>21.7</td>
</tr>
<tr>
<td>416.gamess</td>
<td>50.4</td>
<td>51.7</td>
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<tr>
<td>433.milc</td>
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<td>153</td>
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<tr>
<td>434.zeusmp</td>
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<td>31.5</td>
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<tr>
<td>435.gromacs</td>
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<td>436.cactusADM</td>
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<td>240</td>
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<tr>
<td>437.leslie3d</td>
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<tr>
<td>444.namd</td>
<td>15.4</td>
<td>15.0</td>
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<td>447.dealII</td>
<td>35.1</td>
<td>30.5</td>
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<tr>
<td>450.soplex</td>
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<td>32.6</td>
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<tr>
<td>453.povray</td>
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<td>31.5</td>
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<tr>
<td>454.calculix</td>
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<td></td>
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<tr>
<td>459.GemsFDTD</td>
<td></td>
<td>216</td>
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<tr>
<td>465.tonto</td>
<td>29.7</td>
<td>183</td>
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<tr>
<td>470.lbm</td>
<td></td>
<td>27.1</td>
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<tr>
<td>481.wrf</td>
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<td>84.5</td>
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<tr>
<td>482.sphinx3</td>
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<td>50.4</td>
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Continued on next page
## NEC Corporation

### SPEC CFP2006 Result

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>906</td>
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<td>434.zeusmp</td>
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<td>435.gromacs</td>
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<td>436.cactusADM</td>
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<tr>
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<td>35.0</td>
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<td><strong>35.1</strong></td>
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<tr>
<td>450.soplex</td>
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<td><strong>293</strong></td>
<td><strong>28.5</strong></td>
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<tr>
<td>453.povray</td>
<td>176</td>
<td>30.2</td>
<td>172</td>
<td>30.8</td>
<td><strong>175</strong></td>
<td><strong>30.5</strong></td>
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<td>454.calculix</td>
<td>262</td>
<td>31.5</td>
<td><strong>262</strong></td>
<td><strong>31.5</strong></td>
<td>262</td>
<td>31.5</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>60.8</td>
<td>174</td>
<td><strong>58.1</strong></td>
<td><strong>183</strong></td>
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<td>465.tonto</td>
<td><strong>363</strong></td>
<td><strong>27.1</strong></td>
<td>364</td>
<td>27.1</td>
<td>363</td>
<td>27.1</td>
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<tr>
<td>470.lbm</td>
<td>23.1</td>
<td>596</td>
<td><strong>23.0</strong></td>
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<tr>
<td>481.wrf</td>
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<td>85.6</td>
<td>132</td>
<td>84.4</td>
<td><strong>132</strong></td>
<td><strong>84.5</strong></td>
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<tr>
<td>482.sphinx3</td>
<td><strong>387</strong></td>
<td><strong>50.4</strong></td>
<td>385</td>
<td>50.7</td>
<td>388</td>
<td>50.3</td>
</tr>
</tbody>
</table>

## Results 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:
- Power Management Policy: Custom
- Energy Performance: Performance
- Patrol Scrub: Disabled
- Snoop Mode: Home Snoop with Directory
NEC Corporation

Express5800/E120g-M (Intel Xeon E5-2609 v4)

SPECfp2006 = 76.0
SPECfp_base2006 = 73.8

CPU2006 license: 9006
Test sponsor: NEC Corporation
Test date: Mar-2016
Tested by: NEC Corporation
Hardware Availability: Apr-2016
Software Availability: Nov-2015

General Notes

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

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled

Base Compiler Invocation

C benchmarks:
   icc  -m64

C++ benchmarks:
   icpc -m64

Fortran benchmarks:
   ifort -m64

Benchmarks using both Fortran and C:
   icc  -m64 ifort -m64

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
465.tonto: -DSPEC_CPU_LP64
466.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64
SPEC CFP2006 Result

NEC Corporation
Express5800/E120g-M (Intel Xeon E5-2609 v4)

SPECfp2006 = 76.0
SPECfp_base2006 = 73.8

CPU2006 license: 9006
Test date: Mar-2016
Test sponsor: NEC Corporation
Hardware Availability: Apr-2016
Tested by: NEC Corporation
Software Availability: Nov-2015

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

Peak Compiler Invocation

C benchmarks:
icc   -m64

C++ benchmarks:
icpc  -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc   -m64 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: basepeak = yes

C++ benchmarks:

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SPEC CFP2006 Result

NEC Corporation

Express5800/E120g-M (Intel Xeon E5-2609 v4)

SPECfp2006 = 76.0
SPECfp_base2006 = 73.8

CPU2006 license: 9006
Test sponsor: NEC Corporation
Test date: Mar-2016
Tested by: NEC Corporation
Hardware Availability: Apr-2016
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Peak Optimization Flags (Continued)

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipx(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipx(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipx(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipx(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipx(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes
<table>
<thead>
<tr>
<th>NEC Corporation</th>
<th>SPECfp2006 = 76.0</th>
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</thead>
<tbody>
<tr>
<td>Express5800/E120g-M (Intel Xeon E5-2609 v4)</td>
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CPU2006 license: 9006  Test date: Mar-2016
Test sponsor: NEC Corporation  Hardware Availability: Apr-2016
Tested by: NEC Corporation  Software Availability: Nov-2015

The flags files that were used to format this result can be browsed at:
- [http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120g-RevB.html](http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120g-RevB.html)

You can also download the XML flags sources by saving the following links:
- [http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120g-RevB.xml](http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120g-RevB.xml)

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

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