SPEC® CINT2006 Result
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NEC Corporation

SPECint®_rate2006 = 1140

Express5800/A2040d (Intel Xeon E7-4809 v4)

SPECint_rate_base2006 = 1080

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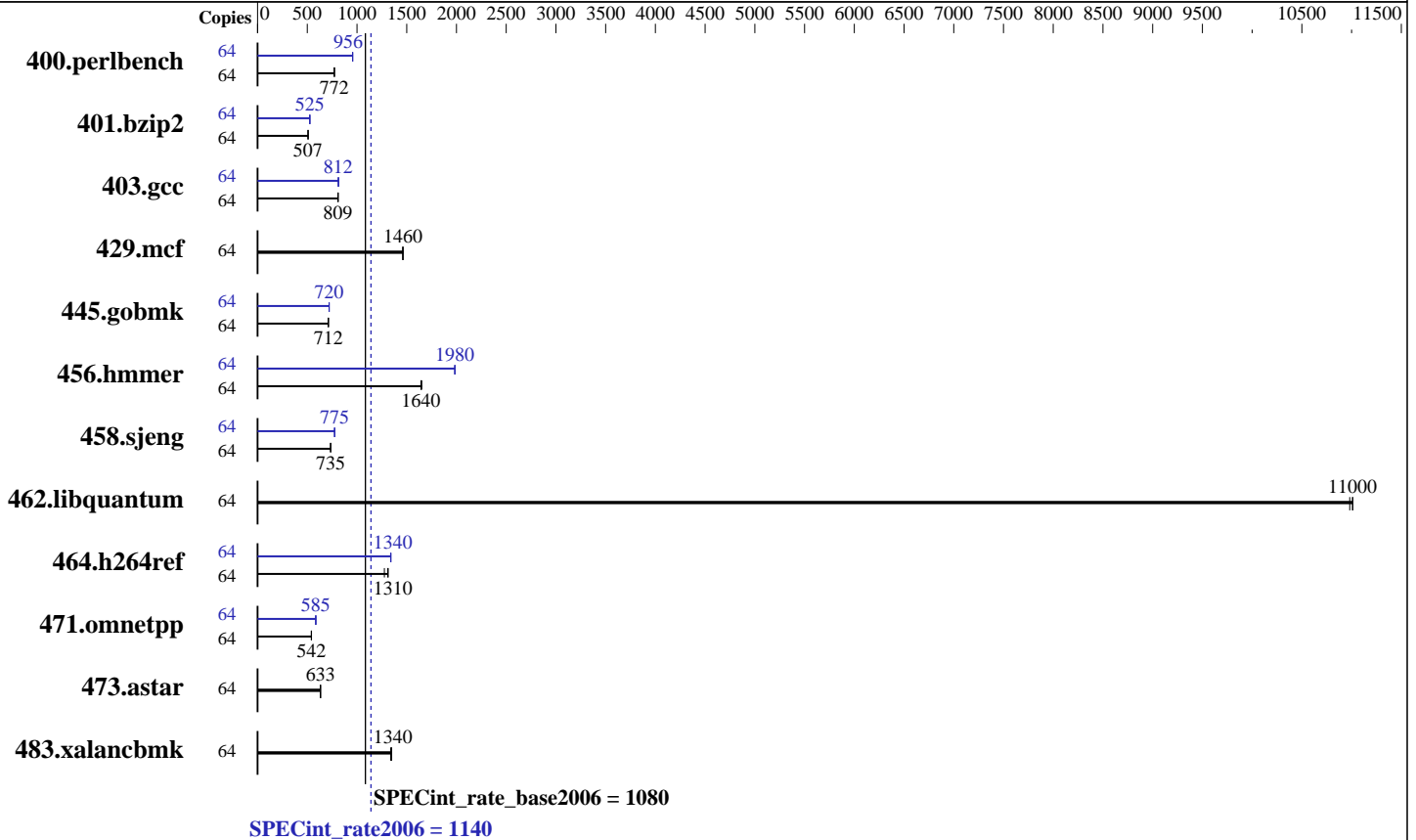**Test sponsor:** NEC Corporation
Tested by: NEC Corporation

Test date: Sep-2016
Hardware Availability: Sep-2016
Software Availability: May-2016

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Hardware

CPU Name: Intel Xeon E7-4809 v4
CPU Characteristics:
CPU MHz: 2100
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: 20 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (64 x 8 GB 1Rx4 PC4-2133P-R , running at 1333 MHz)
Disk Subsystem: 1 x 600 GB SAS, 15000 RPM, RAID 0
Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 6.8 (Santiago)
Kernel 2.6.32-642.el6.x86_64
Compiler: C/C++: Version 16.0.0.109 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	Copies	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Peak Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	64	**810**	**772**	810	772	810	772	64	654	957	**654**	**956**	655	955
401.bzip2	64	1218	507	1213	509	**1217**	**507**	64	1173	527	1178	524	**1176**	**525**
403.gcc	64	**637**	**809**	635	811	637	808	64	636	811	**634**	**812**	632	816
429.mcf	64	400	1460	**399**	**1460**	399	1460	64	400	1460	**399**	**1460**	399	1460
445.gobmk	64	942	713	**943**	**712**	944	711	64	**933**	**720**	933	719	932	720
456.hmmer	64	**363**	**1640**	362	1650	363	1640	64	301	1990	**301**	**1980**	301	1980
458.sjeng	64	1054	735	**1054**	**735**	1053	735	64	998	776	**1000**	**775**	1001	774
462.libquantum	64	120	11000	121	11000	**120**	**11000**	64	120	11000	121	11000	**120**	**11000**
464.h264ref	64	1111	1280	**1082**	**1310**	1078	1310	64	**1057**	**1340**	1056	1340	1058	1340
471.omnetpp	64	737	542	741	540	**738**	**542**	64	**684**	**585**	681	587	685	584
473.astar	64	**710**	**633**	709	634	711	632	64	**710**	**633**	709	634	711	632
483.xalancbmk	64	327	1350	330	1340	**328**	**1340**	64	327	1350	330	1340	**328**	**1340**

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:
 Memory RAS Mode: Independent mode
 VT-x : Disabled
 Processor C6 Report : Disabled
 OS Performance Tuning : Disabled
 Energy Performance : Performance
 Patrol Scrub : Disabled
 Demand Scrub : Disabled
 Memory P.E. Retry : Disabled
```

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/compilers_and_libraries_2016.0.109/linux/compiler/lib/ia32_lin:/opt/intel/compilers_and_libraries_2016.0.109/linux/compiler/lib/intel64_lin"

Transparent Huge Pages enabled with:

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General Notes (Continued)

```
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 -L/opt/intel/compilers_and_libraries_2016.0.109/linux/compiler/lib/ia32_lin
```

C++ benchmarks:
```
icpc -m32 -L/opt/intel/compilers_and_libraries_2016.0.109/linux/compiler/lib/ia32_lin
```

Base Portability Flags

```
  400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
       401.bzip2: -D_FILE_OFFSET_BITS=64
         403.gcc: -D_FILE_OFFSET_BITS=64
         429.mcf: -D_FILE_OFFSET_BITS=64
       445.gobmk: -D_FILE_OFFSET_BITS=64
       456.hmmer: -D_FILE_OFFSET_BITS=64
       458.sjeng: -D_FILE_OFFSET_BITS=64
   462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
     464.h264ref: -D_FILE_OFFSET_BITS=64
     471.omnetpp: -D_FILE_OFFSET_BITS=64
       473.astar: -D_FILE_OFFSET_BITS=64
   483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -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:

Continued on next page

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Base Other Flags (Continued)

403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
    icc -m32 -L/opt/intel/compilers_and_libraries_2016.0.109/linux/compiler/lib/ia32_lin

    400.perlbench: icc -m64

    401.bzip2: icc -m64

    456.hmmer: icc -m64

    458.sjeng: icc -m64

C++ benchmarks:
    icpc -m32 -L/opt/intel/compilers_and_libraries_2016.0.109/linux/compiler/lib/ia32_lin

Peak Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

    400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
                -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
                -par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32

    401.bzip2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
                -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
                -par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch
                -auto-ilp32 -ansi-alias

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Peak Optimization Flags (Continued)

    403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

    429.mcf: basepeak = yes

  445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
             -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias
             -opt-mem-layout-trans=3

  456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

   458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
             -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
             -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
             -auto-ilp32

462.libquantum: basepeak = yes

  464.h264ref: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
             -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
             -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
             -ansi-alias

C++ benchmarks:

  471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
             -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
             -par-num-threads=1(pass 1) -prof-use(pass 2) -ansi-alias
             -opt-ra-region-strategy=block -Wl,-z,muldefs
             -L/opt/SmartHeap_10mc/lib -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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/NEC-platform-Settings-V1.2-A2040d-RevA.html

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You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/NEC-platform-Settings-V1.2-A2040d-RevA.xml

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