SPEC® CINT2006 Result
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NEC Corporation

SPECint®_rate2006 = 994

Express5800/A2040d (Intel Xeon E7-8893 v4)

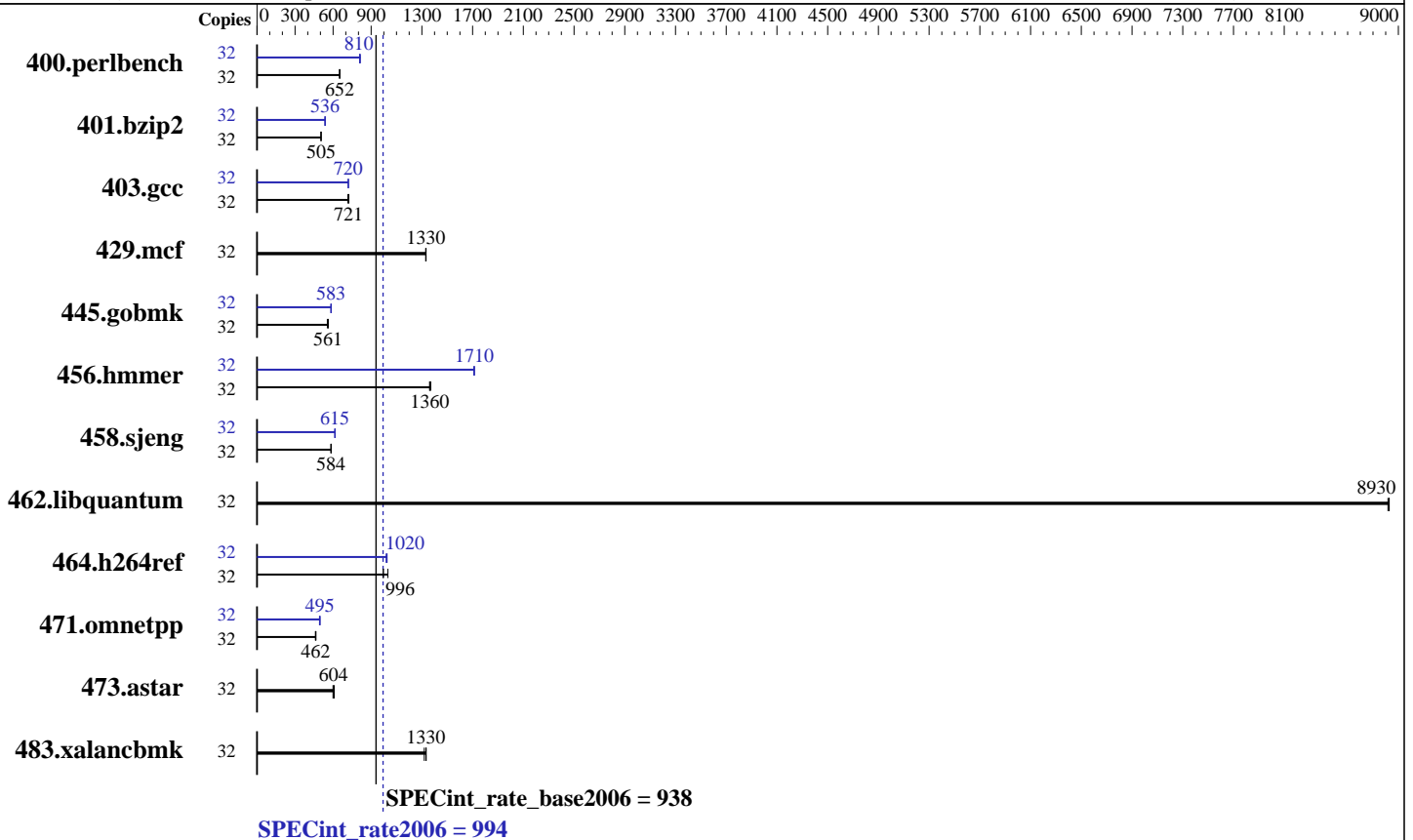SPECint_rate_base2006 = 938

CPU2006 license: 9006　　　　　　　　　　　　　　　　　**Test date:** Apr-2017
Test sponsor: NEC Corporation　　　　　　　　　　　**Hardware Availability:** Sep-2016
Tested by: NEC Corporation　　　　　　　　　　　　**Software Availability:** Nov-2016

Benchmark results (Copies):

- 400.perlbench: 32 / 810 (peak), 32 / 652 (base)
- 401.bzip2: 32 / 536 (peak), 32 / 505 (base)
- 403.gcc: 32 / 720 (peak), 32 / 721 (base)
- 429.mcf: 32 / 1330
- 445.gobmk: 32 / 583 (peak), 32 / 561 (base)
- 456.hmmer: 32 / 1710 (peak), 32 / 1360 (base)
- 458.sjeng: 32 / 615 (peak), 32 / 584 (base)
- 462.libquantum: 32 / 8930
- 464.h264ref: 32 / 1020 (peak), 32 / 996 (base)
- 471.omnetpp: 32 / 495 (peak), 32 / 462 (base)
- 473.astar: 32 / 604
- 483.xalancbmk: 32 / 1330

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Hardware

CPU Name:	Intel Xeon E7-8893 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz:	3200
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 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:	60 MB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (64 x 8 GB 1Rx4 PC4-2400T-R, running at 1600 MHz)
Disk Subsystem:	1 x 600 GB SAS, 15000 RPM, RAID 0
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 7.3 (Maipo) Kernel 3.10.0-514.el7.x86_64
Compiler:	C/C++: Version 16.0.3.210 of Intel C++ Studio XE for Linux
Auto Parallel:	No
File System:	xfs
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 Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	32	**479**	**652**	479	652	480	651	32	**386**	**810**	386	809	384	815
401.bzip2	32	611	505	**611**	**505**	612	505	32	**576**	**536**	574	538	576	536
403.gcc	32	**357**	**721**	356	724	359	717	32	**358**	**720**	358	720	358	720
429.mcf	32	**219**	**1330**	219	1330	219	1330	32	**219**	**1330**	219	1330	219	1330
445.gobmk	32	605	554	598	561	**598**	**561**	32	576	583	574	585	**576**	**583**
456.hmmer	32	219	1360	**219**	**1360**	218	1370	32	**174**	**1710**	175	1710	174	1710
458.sjeng	32	**663**	**584**	664	583	663	584	32	630	615	631	614	**630**	**615**
462.libquantum	32	74.3	8930	74.4	8920	**74.3**	**8930**	32	74.3	8930	74.4	8920	**74.3**	**8930**
464.h264ref	32	686	1030	**711**	**996**	711	995	32	695	1020	**692**	**1020**	690	1030
471.omnetpp	32	434	461	**433**	**462**	430	465	32	402	498	406	493	**404**	**495**
473.astar	32	**372**	**604**	369	609	375	599	32	**372**	**604**	369	609	375	599
483.xalancbmk	32	167	1320	165	1330	**166**	**1330**	32	167	1320	165	1330	**166**	**1330**

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
 Cluster On Die : Enabled
```

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_2016.3.210/linux/compiler/lib/ia32_lin:/opt/intel/compilers_and_libraries_2016.3.210/linux/compiler/lib/intel64_lin"

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General Notes (Continued)

```
Transparent Huge Pages enabled by default

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_2016.3.210/linux/compiler/lib/ia32_lin
```

C++ benchmarks:
```
icpc -m32 -L/opt/intel/compilers_and_libraries_2016.3.210/linux/compiler/lib/intel64_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
```

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Base Other Flags

C benchmarks:

    403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
    icc -m32 -L/opt/intel/compilers_and_libraries_2016.3.210/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_2016.3.210/linux/compiler/lib/intel64_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

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Peak Optimization Flags (Continued)

```
  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

    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
```

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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.20170419.html

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.20170419.xml

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

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