SPEC® CINT2006 Result
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NEC Corporation

Express5800/R120b-1 (Intel Xeon X5650)

SPECint®2006 = 40.0
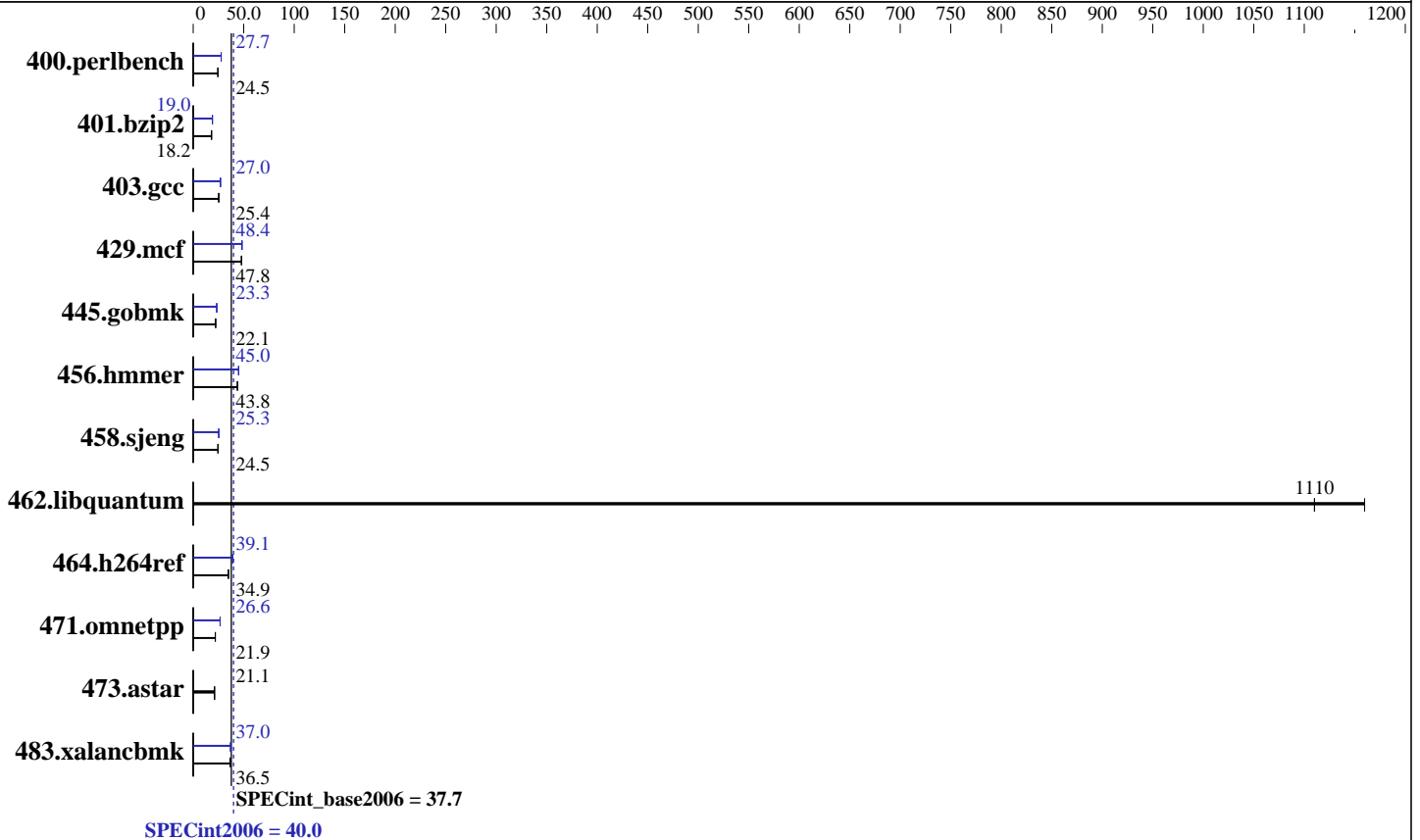
SPECint_base2006 = 37.7

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

Test date: Jun-2011
Hardware Availability: Feb-2011
Software Availability: Mar-2011

Benchmark results chart (scale 0 to 1200):

- **400.perlbench:** 27.7 / 24.5
- **401.bzip2:** 19.0 / 18.2
- **403.gcc:** 27.0 / 25.4
- **429.mcf:** 48.4 / 47.8
- **445.gobmk:** 23.3 / 22.1
- **456.hmmer:** 45.0 / 43.8
- **458.sjeng:** 25.3 / 24.5
- **462.libquantum:** 1110
- **464.h264ref:** 39.1 / 34.9
- **471.omnetpp:** 26.6 / 21.9
- **473.astar:** 21.1
- **483.xalancbmk:** 37.0 / 36.5

SPECint_base2006 = 37.7

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Hardware

CPU Name:	Intel Xeon X5650
CPU Characteristics:	Intel Turbo Boost Technology up to 3.06 GHz
CPU MHz:	2667
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 cores/chip
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:	12 MB I+D on chip per chip
Other Cache:	None
Memory:	96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC)
Disk Subsystem:	1 x 500 GB SATA, 7200 RPM
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
Compiler:	Intel C++ Intel 64 Compiler XE for applications running on Intel 64, Version 12.0.3.174 Build 20110309
Auto Parallel:	Yes
File System:	ext3
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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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	400	24.4	**399**	**24.5**	399	24.5	**353**	**27.7**	352	27.8	353	27.7
401.bzip2	**532**	**18.2**	531	18.2	532	18.2	**507**	**19.0**	507	19.0	507	19.0
403.gcc	320	25.2	317	25.4	**317**	**25.4**	**298**	**27.0**	298	27.0	298	27.0
429.mcf	191	47.8	191	47.8	**191**	**47.8**	**189**	**48.4**	190	48.1	188	48.4
445.gobmk	**474**	**22.1**	474	22.1	468	22.4	449	23.4	**449**	**23.3**	449	23.3
456.hmmer	213	43.8	**213**	**43.8**	213	43.8	208	44.9	**207**	**45.0**	207	45.0
458.sjeng	494	24.5	**494**	**24.5**	491	24.6	**478**	**25.3**	478	25.3	478	25.3
462.libquantum	17.9	1160	**18.7**	**1110**	18.7	1110	17.9	1160	**18.7**	**1110**	18.7	1110
464.h264ref	633	35.0	**634**	**34.9**	637	34.8	**567**	**39.1**	567	39.1	566	39.1
471.omnetpp	284	22.0	286	21.8	**286**	**21.9**	235	26.6	**235**	**26.6**	234	26.7
473.astar	333	21.1	332	21.1	**333**	**21.1**	333	21.1	332	21.1	**333**	**21.1**
483.xalancbmk	**189**	**36.5**	189	36.4	188	36.7	**186**	**37.0**	186	37.1	187	37.0

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

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 1800 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

```
BIOS Settings:
Hyper-Threading Technology: Disabled
Performance/Watt: Traditional
Server Class: Custom
Data Reuse Optimization: Disabled
Memory Voltage: Normal
```

General Notes

```
OMP_NUM_THREADS set to number of cores
The Express5800/R120b-1 and
the Express5800/R120b-2 models are electronically equivalent.
The results have been measured on the Express5800/R120b-1 model.
```

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Base Compiler Invocation

C benchmarks:
    icc -m64

C++ benchmarks:
    icpc -m64

Base Portability Flags

```
      400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
          401.bzip2: -DSPEC_CPU_LP64
            403.gcc: -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:
```
    -xSSE4.2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32
    -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT
```

C++ benchmarks:
```
    -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs
    -L/opt/SmartHeap_8.1/lib64 -lsmartheap64
    -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT
```

Base Other Flags

C benchmarks:

        403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
    icc -m64

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Peak Compiler Invocation (Continued)

400.perlbench: `icc -m32`

429.mcf: `icc -m32`

445.gobmk: `icc -m32`

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`
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: `-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 -ansi-alias`
`-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT`

401.bzip2: `-xSSE4.2(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: `-xSSE4.2 -ipo -O3 -no-prec-div -inline-calloc`
`-opt-malloc-options=3 -auto-ilp32`
`-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT`

429.mcf: `-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 -ansi-alias`
`-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT`

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Peak Optimization Flags (Continued)

445.gobmk: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-prof-use`(pass 2)
`-auto-ilp32` `-ansi-alias`
`-B /usr/share/libhugetlbfs/` `-Wl,-hugetlbfs-link=BDT`

456.hmmer: `-xSSE4.2` `-ipo` `-O3` `-no-prec-div` `-unroll2` `-auto-ilp32`
`-ansi-alias`
`-B /usr/share/libhugetlbfs/` `-Wl,-melf_x86_64` `-Wl,-hugetlbfs-link=BDT`

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`

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`
`-B /usr/share/libhugetlbfs/` `-Wl,-hugetlbfs-link=BDT`

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)
`-opt-ra-region-strategy=block` `-ansi-alias` `-Wl,-z,muldefs`
`-L/opt/SmartHeap_8.1/lib` `-lsmartheap`
`-B /usr/share/libhugetlbfs/` `-Wl,-hugetlbfs-link=BDT`

473.astar: basepeak = yes

483.xalancbmk: `-xSSE4.2` `-ipo` `-O3` `-no-prec-div` `-opt-prefetch` `-ansi-alias`
`-Wl,-z,muldefs` `-L/opt/SmartHeap_8.1/lib` `-lsmartheap`
`-B /usr/share/libhugetlbfs/` `-Wl,-hugetlbfs-link=BDT`

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-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revF.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revF.xml

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

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