SPEC® CFP2006 Result

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HITACHI

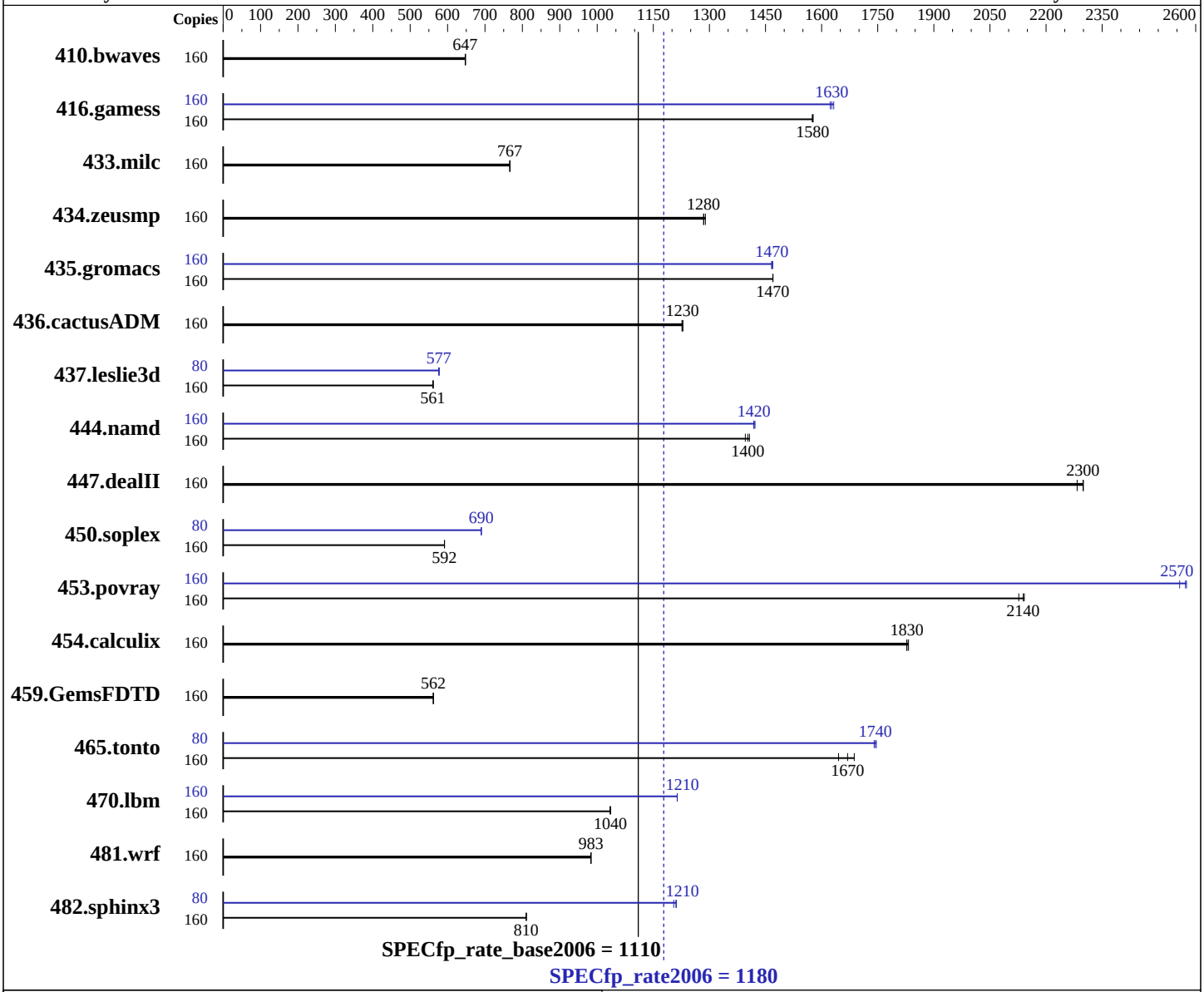
Compute Blade 2000 (Intel Xeon E7-8870)

SPECfp®_rate2006 = 1180

SPECfp_rate_base2006 = 1110

CPU2006 license: 35
Test sponsor: HITACHI
Tested by: HITACHI

Test date: Jun-2011
Hardware Availability: Aug-2011
Software Availability: Jan-2011



Hardware

CPU Name:	Intel Xeon E7-8870
CPU Characteristics:	Intel Turbo Boost Technology up to 2.80 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	80 cores, 8 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable:	1, 2, 4, 8 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core

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Software

Operating System:	Red Hat Enterprise Linux Server release 5.6.3, Advanced Platform, Kernel 2.6.18-238.9.1.el5 on an x86_64
Compiler:	Intel C++ Compiler XE for Linux Version 12.0.2.137 Build 20110112 Intel Fortran Compiler XE for Linux Version 12.0.2.137 Build 20110112
Auto Parallel:	No
File System:	tmpfs

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L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (128 x 8 GB 2Rx4 PC3-10600R-9, ECC, running at 1066 MHz)
Disk Subsystem: 10 x 73 GB 15000 rpm Fibre Channel RAID1+0 configuration
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	160	**3359**	**647**	3355	648	3361	647	160	**3359**	**647**	3355	648	3361	647
416.gamess	160	1989	1570	**1987**	**1580**	1986	1580	160	1919	1630	**1925**	**1630**	1930	1620
433.milc	160	**1916**	**767**	1917	766	1915	767	160	**1916**	**767**	1917	766	1915	767
434.zeusmp	160	1133	1280	1129	1290	**1133**	**1280**	160	1133	1280	1129	1290	**1133**	**1280**
435.gromacs	160	**777**	**1470**	777	1470	777	1470	160	777	1470	**779**	**1470**	779	1470
436.cactusADM	160	**1556**	**1230**	1556	1230	1559	1230	160	**1556**	**1230**	1556	1230	1559	1230
437.leslie3d	160	**2682**	**561**	2684	560	2676	562	80	**1304**	**577**	1304	576	1302	578
444.namd	160	912	1410	**915**	**1400**	919	1400	160	905	1420	902	1420	**904**	**1420**
447.dealII	160	**796**	**2300**	796	2300	802	2280	160	**796**	**2300**	796	2300	802	2280
450.soplex	160	**2255**	**592**	2255	592	2256	592	80	**967**	**690**	967	690	966	690
453.povray	160	400	2130	397	2140	**398**	**2140**	160	**331**	**2570**	333	2560	331	2580
454.calculix	160	**722**	**1830**	722	1830	720	1830	160	**722**	**1830**	722	1830	720	1830
459.GemsFDTD	160	3022	562	3019	562	**3022**	**562**	160	3022	562	3019	562	**3022**	**562**
465.tonto	160	957	1650	933	1690	**943**	**1670**	80	451	1750	**451**	**1740**	452	1740
470.lbm	160	2126	1030	2122	1040	**2123**	**1040**	160	1811	1210	1811	1210	**1811**	**1210**
481.wrf	160	1818	983	**1818**	**983**	1817	984	160	1818	983	**1818**	**983**	1817	984
482.sphinx3	160	3849	810	3847	811	**3849**	**810**	80	1294	1200	1287	1210	**1288**	**1210**

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

Submit Notes

```
The config file option 'submit' was used.
 '/usr/bin/numactl' used to bind processes to CPUs
```

Operating System Notes

```
 'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
 Hugepages was not enabled for this run
 Tmpfs filesystem was used with:
  mkdir -p /mnt/shm
  mount -t tmpfs -o size=500g,rw,mpol=interleave tmpfs /mnt/shm/
```

Platform Notes

```
BIOS Settings:
 Adjacent Cache Line Prefetch = enabled
```

General Notes

```
Binaries compiled on RHEL5.4.3
HITACHI BladeSymphony BS2000 and
HITACHI Compute Blade 2000 are electronically equivalent.
The results have been measured on a HITACHI BladeSymphony BS2000.
```

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
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

C++ benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

Fortran benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static`

Benchmarks using both Fortran and C:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

Peak Compiler Invocation

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

482.sphinx3: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m64`

450.soplex: `icpc -m32`

Fortran benchmarks:
`ifort -m64`

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

Peak 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`
453.povray: `-DSPEC_CPU_LP64`
454.calculix: `-DSPEC_CPU_LP64 -nofor_main`
459.GemsFDTD: `-DSPEC_CPU_LP64`
465.tonto: `-DSPEC_CPU_LP64`

Continued on next page

Peak Portability Flags (Continued)

470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
-ansi-alias -opt-prefetch -static -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2

C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -fno-alias
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: -xSSE4.2 -ipo -O3 -no-prec-div
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto
-inline-calloc -opt-malloc-options=3

Continued on next page

Peak Optimization Flags (Continued)

465.tonto (continued):
`-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT`

Benchmarks using both Fortran and C:

435.gromacs: `-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` `-static -auto-ilp32`

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

481.wrf: `basepeak = yes`

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/PlatformHitachi.20110720.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/PlatformHitachi.20110720.xml`

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