SPEC® CFP2006 Result

NEC Corporation

Express5800/R120a-1
(Intel Xeon E5504)

$SPECfp^{®}2006 =$ 25.3
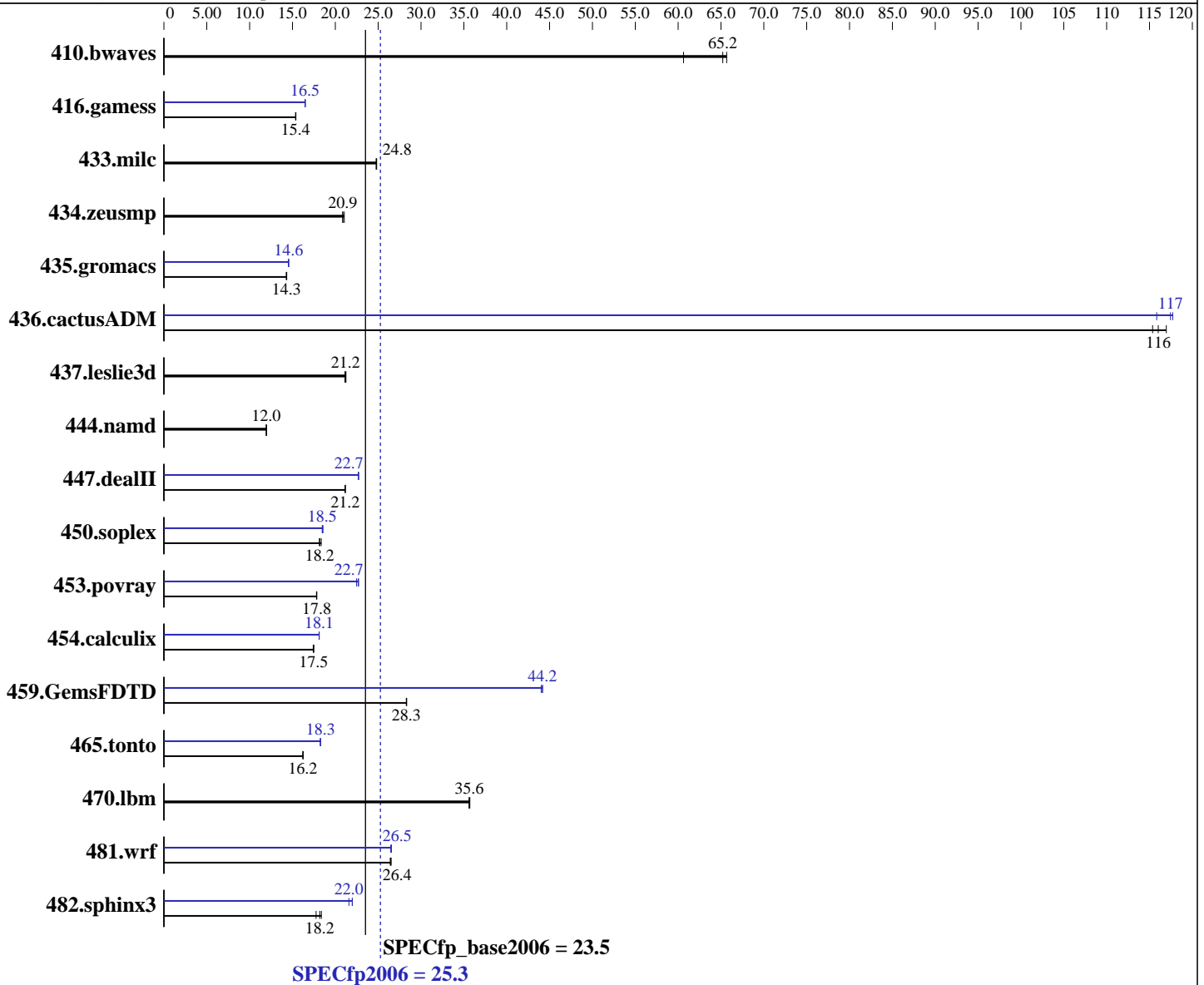
$SPECfp\_base2006 =$ 23.5

CPU2006 license: 9006

Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Apr-2009

Hardware Availability: Apr-2009

Software Availability: Feb-2009

Benchmark	Value
410.bwaves	65.2
416.gamess	16.5 / 15.4
433.milc	24.8
434.zeusmp	20.9
435.gromacs	14.6 / 14.3
436.cactusADM	117 / 116
437.leslie3d	21.2
444.namd	12.0
447.dealII	22.7 / 21.2
450.soplex	18.5 / 18.2
453.povray	22.7 / 17.8
454.calculix	18.1 / 17.5
459.GemsFDTD	44.2 / 28.3
465.tonto	18.3 / 16.2
470.lbm	35.6
481.wrf	26.5 / 26.4
482.sphinx3	22.0 / 18.2

SPECfp_base2006 = 23.5

SPECfp2006 = 25.3

Hardware

CPU Name: Intel Xeon E5504

CPU Characteristics:

CPU MHz: 2000

FPU: Integrated

CPU(s) enabled: 8 cores, 2 chips, 4 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

Continued on next page

Software

Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP2 with patch Linux kernel 20090119, Kernel 2.6.16.60-0.34-smp

Compiler: Intel C++ and Fortran Compiler 11.0 for Linux Build 20090131 Package ID: l_cproc_p_11.0.081, l_cprof_p_11.0.081

Auto Parallel: Yes

File System: ReiserFS

System State: Run level 3 (multi-user)

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SPECfp2006 =	25.3
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L3 Cache:	4 MB I+D on chip per chip
Other Cache:	None
Memory:	48 GB (12 X 4 GB PC3-8500R running at 800 MHz)
Disk Subsystem:	1x146.5 GB SAS, 15000 RPM
Other Hardware:	None
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	Binutils 2.18.50.0.7.20080502

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**208**	**65.2**	224	60.6	207	65.7	**208**	**65.2**	224	60.6	207	65.7
416.gamess	**1274**	**15.4**	1271	15.4	1274	15.4	1188	16.5	**1188**	**16.5**	1188	16.5
433.milc	371	24.8	**370**	**24.8**	370	24.8	371	24.8	**370**	**24.8**	370	24.8
434.zeusmp	**436**	**20.9**	436	20.9	432	21.0	**436**	**20.9**	436	20.9	432	21.0
435.gromacs	498	14.3	500	14.3	**499**	**14.3**	492	14.5	**491**	**14.6**	490	14.6
436.cactusADM	102	117	104	115	**103**	**116**	103	116	102	118	**102**	**117**
437.leslie3d	445	21.1	443	21.2	**444**	**21.2**	445	21.1	443	21.2	**444**	**21.2**
444.namd	672	11.9	671	12.0	**671**	**12.0**	672	11.9	671	12.0	**671**	**12.0**
447.dealII	541	21.2	541	21.1	**541**	**21.2**	**504**	**22.7**	504	22.7	504	22.7
450.soplex	454	18.4	**459**	**18.2**	460	18.1	449	18.6	451	18.5	**451**	**18.5**
453.povray	**298**	**17.8**	298	17.8	299	17.8	234	22.7	237	22.5	**235**	**22.7**
454.calculix	474	17.4	**472**	**17.5**	472	17.5	455	18.1	455	18.1	**455**	**18.1**
459.GemsFDTD	375	28.3	**375**	**28.3**	374	28.3	240	44.2	241	44.0	**240**	**44.2**
465.tonto	605	16.3	**606**	**16.2**	607	16.2	538	18.3	539	18.2	**539**	**18.3**
470.lbm	**386**	**35.6**	386	35.6	385	35.7	**386**	**35.6**	386	35.6	385	35.7
481.wrf	**422**	**26.4**	423	26.4	421	26.5	422	26.5	421	26.5	**421**	**26.5**
482.sphinx3	1061	18.4	**1072**	**18.2**	1098	17.8	903	21.6	887	22.0	**887**	**22.0**

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
OMP_NUM_THREADS set to number of cores
KMP_AFFINITY set to granularity=fine,scatter
KMP_STACKSIZE set to 200M
```

Platform Notes

```
BIOS setting:
NUMA configuration : Enabled
```

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CPU2006 license: 9006

Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Apr-2009

Hardware Availability: Apr-2009

Software Availability: Feb-2009

General Notes

```
The NEC Express5800/R120a-1(Intel Xeon E5504),
the NEC Express5800/R120a-2(Intel Xeon E5504),
the Bull NovaScale R440 E2 (Intel Xeon E5504, 2.00 GHz) and
the Bull NovaScale R460 E2 (Intel Xeon E5504, 2.00 GHz) models are electronically equivalent.
The results have been measured on a NEC Express5800/R120a-2(Intel Xeon E5504) model.
```

Base Compiler Invocation

C benchmarks:
```
icc
```

C++ benchmarks:
```
icpc
```

Fortran benchmarks:
```
ifort
```

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

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 -parallel -opt-prefetch
```

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$SPECfp2006 = $ 25.3

$SPECfp_base2006 = $ 23.5

Base Optimization Flags (Continued)

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

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

Benchmarks using both Fortran and C:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Peak Compiler Invocation

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

```
482.sphinx3: icc -m32
```

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

```
450.soplex: icpc -m32
```

Fortran benchmarks:
```
ifort
```

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

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

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$SPECfp\_base2006 =$ 23.5

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Hardware Availability: Apr-2009
Software Availability: Feb-2009

Peak Optimization Flags

C benchmarks:

      433.milc: `basepeak = yes`

      470.lbm: `basepeak = yes`

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

C++ benchmarks:

     444.namd: `basepeak = yes`

    447.dealII: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
           `-no-prec-div`(pass 2) `-static`(pass 2) `-prof-use`(pass 2)
           `-unroll2 -ansi-alias -scalar-rep- -opt-prefetch`

    450.soplex: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
           `-no-prec-div`(pass 2) `-static`(pass 2) `-prof-use`(pass 2)
           `-opt-malloc-options=3`

    453.povray: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
           `-no-prec-div`(pass 2) `-static`(pass 2) `-prof-use`(pass 2)
           `-unroll4 -ansi-alias`

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) `-static`(pass 2) `-prof-use`(pass 2)
           `-unroll2 -Ob0 -ansi-alias -scalar-rep-`

   434.zeusmp: `basepeak = yes`

   437.leslie3d: `basepeak = yes`

  459.GemsFDTD: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
           `-no-prec-div`(pass 2) `-static`(pass 2) `-prof-use`(pass 2)
           `-unroll2 -Ob0 -opt-prefetch -parallel`

     465.tonto: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
           `-no-prec-div`(pass 2) `-static`(pass 2) `-prof-use`(pass 2)
           `-unroll4 -auto`

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) `-static`(pass 2) `-prof-use`(pass 2)
           `-opt-prefetch -auto-ilp32`

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$SPECfp2006 =$ 25.3

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Peak Optimization Flags (Continued)

436.cactusADM: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
`-no-prec-div`(pass 2) `-static`(pass 2) `-prof-use`(pass 2)
`-unroll2 -opt-prefetch -parallel -auto-ilp32`

454.calculix: `-xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32`

481.wrf: `-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch`
`-parallel -auto-ilp32`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revG.html
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revE.20090710.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revG.xml
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revE.20090710.xml

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