SPEC® CFP2006 Result
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ASUSTeK Computer Inc.

ASUS ESC4000 G2 (Z9PG-D16) Server System
(Intel Xeon E5-2690)

$SPECfp^{®}2006 =$ 93.7

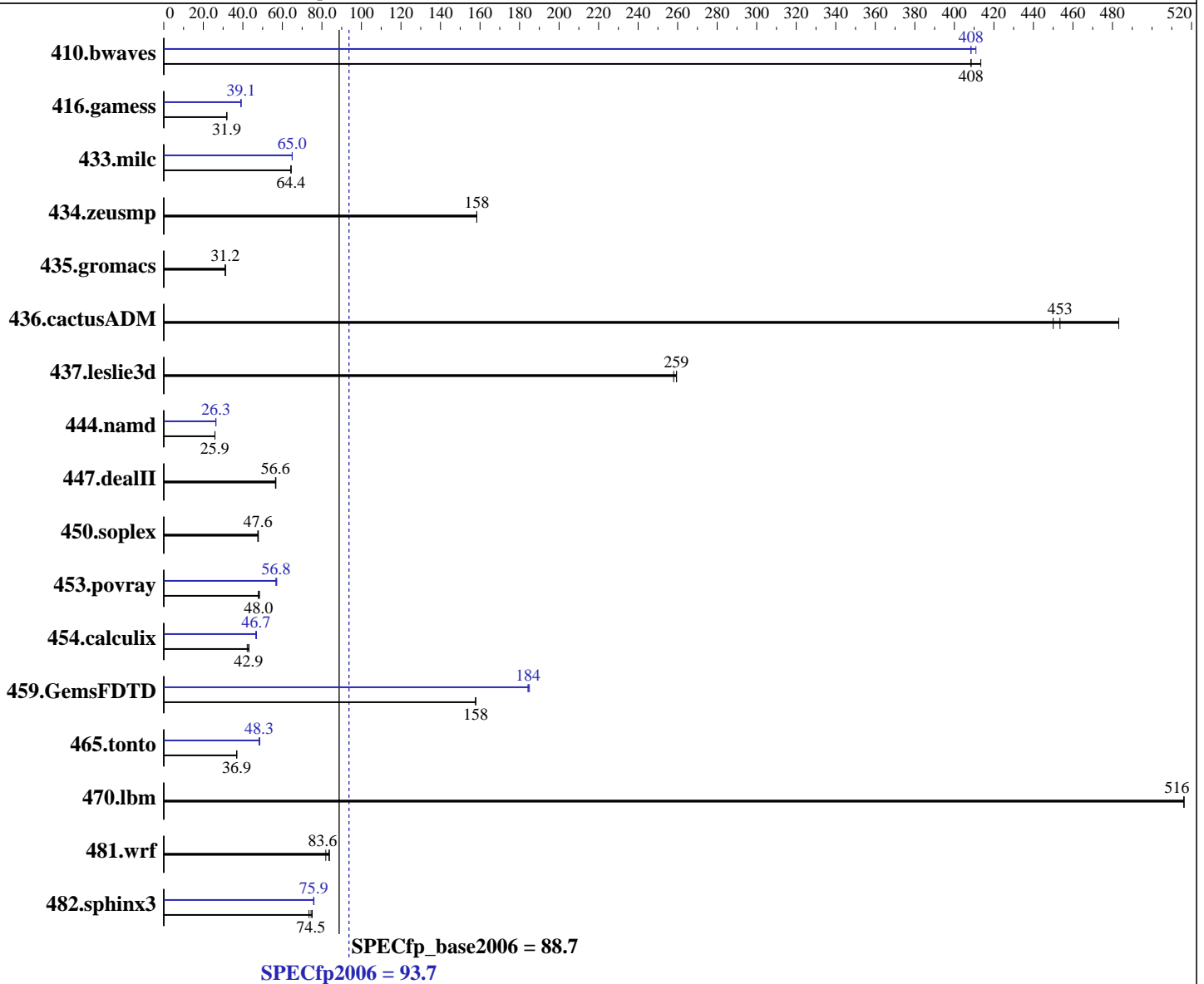$SPECfp\_base2006 =$ 88.7

CPU2006 license: 9016
Test sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test date: Feb-2013
Hardware Availability: Mar-2012
Software Availability: Dec-2011

Benchmark	Value
410.bwaves	408 / 408
416.gamess	39.1 / 31.9
433.milc	65.0 / 64.4
434.zeusmp	158
435.gromacs	31.2
436.cactusADM	453
437.leslie3d	259
444.namd	26.3 / 25.9
447.dealII	56.6
450.soplex	47.6
453.povray	56.8 / 48.0
454.calculix	46.7 / 42.9
459.GemsFDTD	184 / 158
465.tonto	48.3 / 36.9
470.lbm	516
481.wrf	83.6
482.sphinx3	75.9 / 74.5

SPECfp_base2006 = 88.7
SPECfp2006 = 93.7

Hardware

CPU Name: Intel Xeon E5-2690
CPU Characteristics: Intel Turbo Boost Technology up to 3.80 GHz
CPU MHz: 2900
FPU: Integrated
CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core
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: Red Hat Enterprise Linux Server release 6.2 (Santiago)
2.6.32-220.el6.x86_64
Compiler: C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux;
Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: ext4

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L3 Cache:	20 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)	Peak Pointers:	32/64-bit
Disk Subsystem:	HITACHI HDP725050GLA380 1 x 500 GB SATA, 7200 RPM	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
410.bwaves	**33.3**	**408**	33.3	408	32.9	413	33.3	408	**33.3**	**408**	33.1	411
416.gamess	616	31.8	614	31.9	**614**	**31.9**	502	39.0	501	39.1	**501**	**39.1**
433.milc	143	64.4	143	64.3	**143**	**64.4**	141	65.0	141	65.0	**141**	**65.0**
434.zeusmp	57.5	158	**57.5**	**158**	57.5	158	57.5	158	**57.5**	**158**	57.5	158
435.gromacs	230	31.0	**229**	**31.2**	229	31.2	230	31.0	**229**	**31.2**	229	31.2
436.cactusADM	**26.4**	**453**	26.6	450	24.7	483	**26.4**	**453**	26.6	450	24.7	483
437.leslie3d	**36.2**	**259**	36.4	258	36.2	259	**36.2**	**259**	36.4	258	36.2	259
444.namd	**310**	**25.9**	310	25.9	310	25.9	304	26.4	**304**	**26.3**	304	26.3
447.dealII	202	56.5	**202**	**56.6**	202	56.7	202	56.5	**202**	**56.6**	202	56.7
450.soplex	175	47.6	174	47.9	**175**	**47.6**	175	47.6	174	47.9	**175**	**47.6**
453.povray	**111**	**48.0**	110	48.4	111	47.8	93.1	57.2	93.7	56.8	**93.6**	**56.8**
454.calculix	**192**	**42.9**	195	42.2	191	43.1	177	46.6	176	46.9	**177**	**46.7**
459.GemsFDTD	**67.2**	**158**	67.2	158	67.2	158	57.4	185	**57.6**	**184**	57.6	184
465.tonto	**267**	**36.9**	267	36.8	266	37.0	203	48.5	204	48.2	**204**	**48.3**
470.lbm	26.6	516	26.6	516	**26.6**	**516**	26.6	516	26.6	516	**26.6**	**516**
481.wrf	**134**	**83.6**	136	82.0	133	83.8	**134**	**83.6**	136	82.0	133	83.8
482.sphinx3	265	73.5	259	75.1	**261**	**74.5**	257	76.0	**257**	**75.9**	257	75.8

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

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
Sysinfo program /cpu2006/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on localhost Mon Feb  4 21:55:54 2013

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2690 0 @ 2.90GHz
```

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Platform Notes (Continued)

```
    2 "physical id"s (chips)
    32 "processors"
    cores, siblings (Caution: counting these is hw and system dependent.  The
    following excerpts from /proc/cpuinfo might not be reliable.  Use with
    caution.)
    cpu cores : 8
    siblings  : 16
    physical 0: cores 0 1 2 3 4 5 6 7
    physical 1: cores 0 1 2 3 4 5 6 7
    cache size : 20480 KB

    From /proc/meminfo
    MemTotal:       132253860 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

    /usr/bin/lsb_release -d
    Red Hat Enterprise Linux Server release 6.2 (Santiago)

    From /etc/*release* /etc/*version*
    redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
    system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

    uname -a:
    Linux localhost 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST 2011
    x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 Feb 4 16:28

    SPEC is set to: /cpu2006
    Filesystem     Type     Size   Used Avail Use% Mounted on

    /dev/sda1      ext4     459G  205G  231G  48% /

    (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64"
OMP_NUM_THREADS = "16"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
memory using RHEL5.5
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
```

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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:
        -xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
        -ansi-alias

C++ benchmarks:
        -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

Fortran benchmarks:
        -xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:
        -xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
        -ansi-alias

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Peak Compiler Invocation

C benchmarks:
```
icc    -m64
```

C++ benchmarks:
```
icpc   -m64
```

Fortran benchmarks:
```
ifort -m64
```

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

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

> 433.milc: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32 -ansi-alias`

> 470.lbm: `basepeak = yes`

> 482.sphinx3: `-xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias -parallel`

C++ benchmarks:

> 444.namd: `-xAVX(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: `basepeak = yes`

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

Fortran benchmarks:

> 410.bwaves: `-xAVX -ipo -O3 -no-prec-div -opt-prefetch -parallel -static`

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Peak Optimization Flags (Continued)

416.gamess: -xAVX(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: basepeak = yes

459.GemsFDTD: -xAVX(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 -opt-prefetch -parallel

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

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/ASUSTekPlatform.20120313.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/ASUSTekPlatform.20120313.xml

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

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