SPEC® CFP2006 Result

Cisco Systems

Cisco UCS B200 M4 (Intel Xeon E5-2650L v3 @ 1.80GHz)

$SPECfp^{®}_rate2006 = $ 639

$SPECfp_rate_base2006 = $ 627

CPU2006 license: 9019
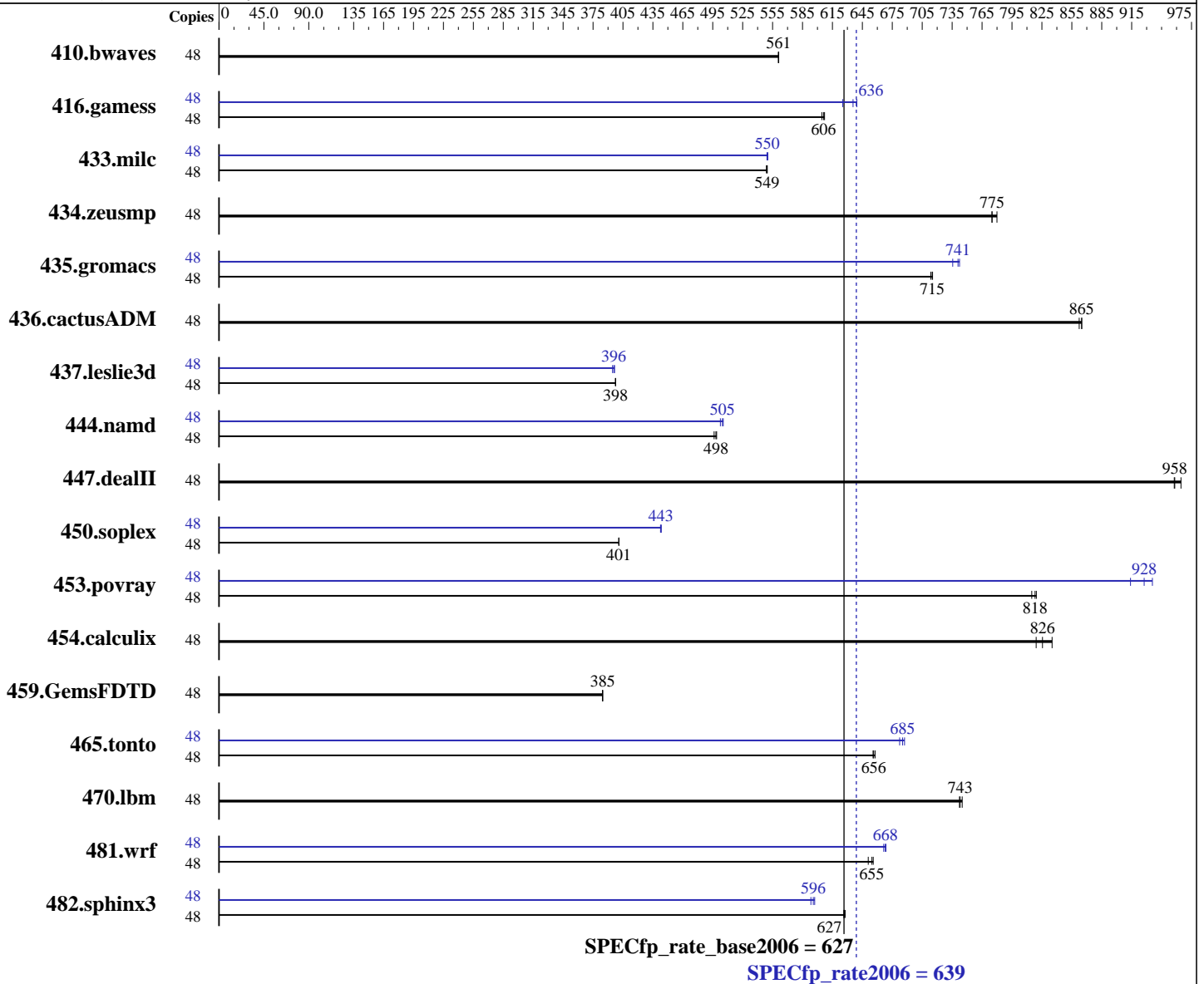
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Dec-2014

Hardware Availability: Sep-2014

Software Availability: Nov-2013

Benchmark	Copies	Result
410.bwaves	48	561
416.gamess	48	636
416.gamess	48	606
433.milc	48	550
433.milc	48	549
434.zeusmp	48	775
435.gromacs	48	741
435.gromacs	48	715
436.cactusADM	48	865
437.leslie3d	48	396
437.leslie3d	48	398
444.namd	48	505
444.namd	48	498
447.dealII	48	958
450.soplex	48	443
450.soplex	48	401
453.povray	48	928
453.povray	48	818
454.calculix	48	826
459.GemsFDTD	48	385
465.tonto	48	685
465.tonto	48	656
470.lbm	48	743
481.wrf	48	668
481.wrf	48	655
482.sphinx3	48	596
482.sphinx3	48	627

SPECfp_rate_base2006 = 627

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Hardware

CPU Name: Intel Xeon E5-2650L v3

CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz

CPU MHz: 1800

FPU: Integrated

CPU(s) enabled: 24 cores, 2 chips, 12 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 6.5 (Santiago)
2.6.32-431.el6.x86_64

Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;
Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux

Auto Parallel: No

File System: ext4

Continued on next page

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L3 Cache:	30 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 300GB SAS, 15K RPM	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	48	1162	561	**1163**	**561**	1163	561	48	1162	561	**1163**	**561**	1163	561
416.gamess	48	1555	604	1548	607	**1550**	**606**	48	1470	640	1503	625	**1479**	**636**
433.milc	48	802	550	803	549	**802**	**549**	48	801	550	**801**	**550**	802	549
434.zeusmp	48	564	775	560	780	**564**	**775**	48	564	775	560	780	**564**	**775**
435.gromacs	48	479	715	**479**	**715**	480	714	48	**463**	**741**	462	742	466	736
436.cactusADM	48	663	865	**663**	**865**	665	862	48	663	865	**663**	**865**	665	862
437.leslie3d	48	**1135**	**398**	1134	398	1135	397	48	1138	397	**1140**	**396**	1144	395
444.namd	48	**773**	**498**	772	499	776	496	48	766	503	761	506	**763**	**505**
447.dealII	48	**573**	**958**	569	964	573	958	48	**573**	**958**	569	964	573	958
450.soplex	48	998	401	**999**	**401**	999	401	48	904	443	903	443	**903**	**443**
453.povray	48	**312**	**818**	313	815	312	819	48	279	914	**275**	**928**	273	936
454.calculix	48	474	835	**480**	**826**	483	819	48	474	835	**480**	**826**	483	819
459.GemsFDTD	48	1325	384	1323	385	**1324**	**385**	48	1325	384	1323	385	**1324**	**385**
465.tonto	48	718	658	**720**	**656**	720	656	48	**689**	**685**	692	682	687	687
470.lbm	48	885	745	**888**	**743**	888	742	48	885	745	**888**	**743**	888	742
481.wrf	48	**819**	**655**	817	656	824	651	48	805	666	**803**	**668**	802	669
482.sphinx3	48	**1493**	**627**	1490	628	1493	627	48	1576	593	**1570**	**596**	1566	597

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

CPU performance set to HPC
Power Technology set to Custom
Processor Power State C6 set to Disabled

Continued on next page

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Platform Notes (Continued)

```
Energy Performance BIAS setting set to Balanced Performance
Memory RAS configuration set to Maximum Performance
QPI Snoop Mode set to Cluster-on-Die
 Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6818
 $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
 running on rhel65 Sat Dec 20 11:10:11 2014

 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 E5-2650L v3 @ 1.80GHz
       2 "physical id"s (chips)
       48 "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 : 12
       siblings  : 24
       physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
       physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
    cache size : 15360 KB

 From /proc/meminfo
    MemTotal:       264256812 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /usr/bin/lsb_release -d
    Red Hat Enterprise Linux Server release 6.5 (Santiago)

 From /etc/*release* /etc/*version*
    redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
    system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

 uname -a:
    Linux rhel65 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013 x86_64
    x86_64 x86_64 GNU/Linux

 run-level 3 Dec 19 20:37

 SPEC is set to: /opt/cpu2006-1.2
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sdb2       ext4  245G   52G  181G  23% /

 Additional information from dmidecode:
   BIOS Cisco Systems, Inc. B200M4.2.2.3c.0.101420141352 10/14/2014
   Memory:
   16x 0xCE00 M393A2G40DB0-CPB 16 GB 2133 MHz 2 rank
   8x NO DIMM NO DIMM
```

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Test date: Dec-2014
Hardware Availability: Sep-2014
Software Availability: Nov-2013

Platform Notes (Continued)

```
  (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 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    -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
```

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Base Portability Flags (Continued)

```
  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:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

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
```

Continued on next page

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Test sponsor:	Cisco Systems	**Hardware Availability:**	Sep-2014
Tested by:	Cisco Systems	**Software Availability:**	Nov-2013

Peak Portability Flags (Continued)

```
      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
```

Peak Optimization Flags

C benchmarks:

```
        433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                  -O3(pass 2) -no-prec-div(pass 2)
                  -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
                  -auto-ilp32

        470.lbm: basepeak = yes

     482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
                  -unroll2
```

C++ benchmarks:

```
        444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                  -O3(pass 2) -no-prec-div(pass 2)
                  -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias
                  -auto-ilp32

       447.dealII: basepeak = yes

      450.soplex: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                  -O3(pass 2) -no-prec-div(pass 2)
                  -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
                  -opt-malloc-options=3

      453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                  -O3(pass 2) -no-prec-div(pass 2)
                  -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4
                  -ansi-alias
```

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Tested by: Cisco Systems

Test date: Dec-2014
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Software Availability: Nov-2013

Peak Optimization Flags (Continued)

Fortran benchmarks:

    410.bwaves: basepeak = yes

    416.gamess: -xCORE-AVX2(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-

    434.zeusmp: basepeak = yes

    437.leslie3d: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

  459.GemsFDTD: basepeak = yes

      465.tonto: -xCORE-AVX2(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

Benchmarks using both Fortran and C:

    435.gromacs: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
           -O3(pass 2) -no-prec-div(pass 2)
           -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
           -opt-prefetch -auto-ilp32

  436.cactusADM: basepeak = yes

   454.calculix: basepeak = yes

     481.wrf: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revC.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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