



# SPEC® CFP2006 Result

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## Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8860 v4 2.20 GHz)

SPECfp®\_rate2006 = Not Run

SPECfp\_rate\_base2006 = 2070

CPU2006 license: 9019

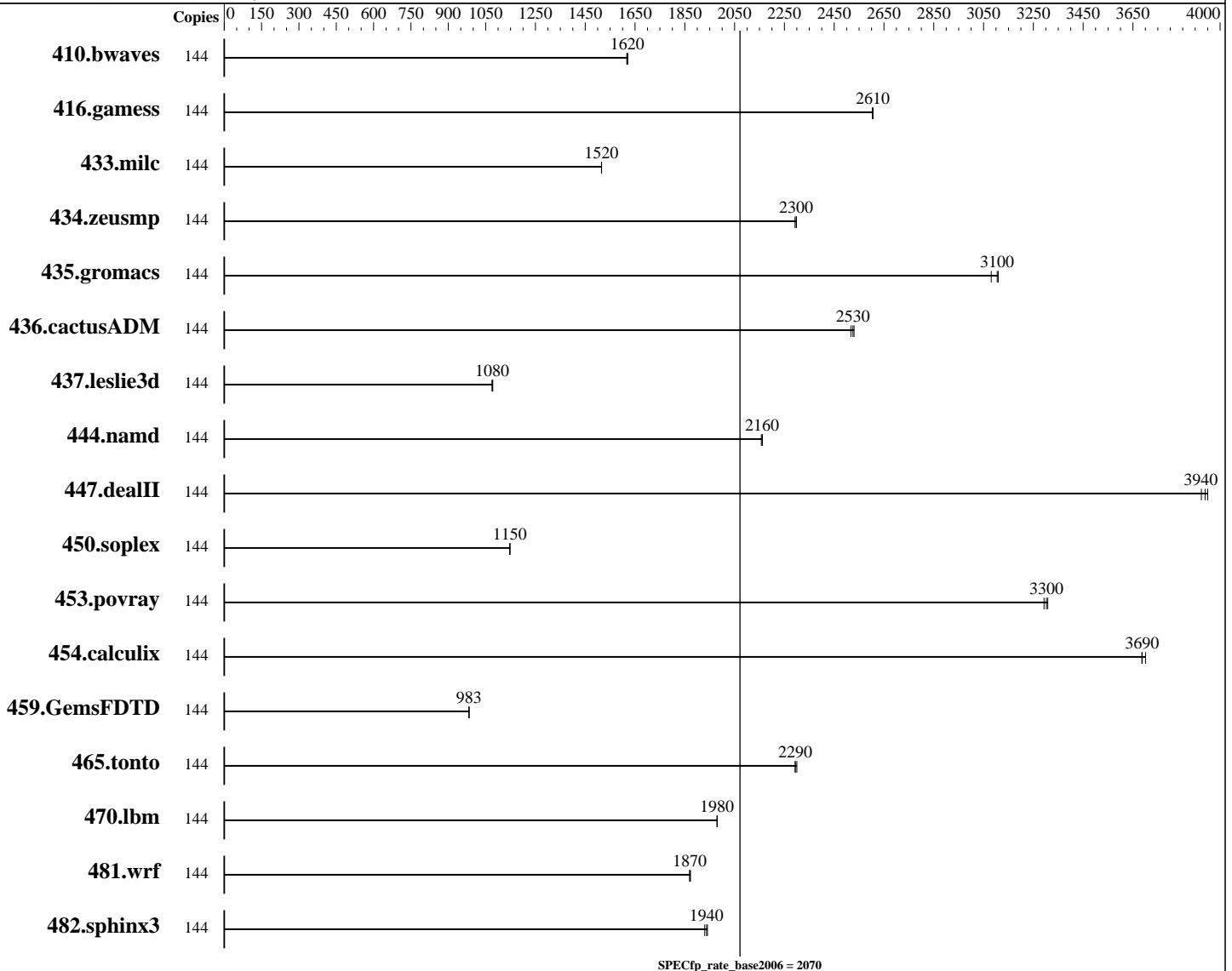
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Nov-2016

Hardware Availability: Jul-2016

Software Availability: Dec-2015



### Hardware

CPU Name: Intel Xeon E7-8860 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 72 cores, 4 chips, 18 cores/chip, 2 threads/core  
 CPU(s) orderable: 2,4 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: SUSE Linux Enterprise Server 12 SP1 (x86\_64) 3.12.49-11-default  
 Compiler: C/C++: Version 16.0.3.210 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.3.210 of Intel Fortran Studio XE for Linux  
 Auto Parallel: No  
 File System: ext4  
 System State: Run level 3 (multi-user)

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L3 Cache: 45 MB I+D on chip per chip  
Other Cache: None  
Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)  
Disk Subsystem: 1 x 400 GB SAS SSD  
Other Hardware: None

Base Pointers: 32/64-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	144	1210	1620	<u>1208</u>	<u>1620</u>	1208	1620							
416.gamess	144	1083	2600	<u>1082</u>	<u>2610</u>	1082	2610							
433.milc	144	872	1520	872	1520	<u>872</u>	<u>1520</u>							
434.zeusmp	144	<u>570</u>	<u>2300</u>	572	2290	570	2300							
435.gromacs	144	<u>331</u>	<u>3100</u>	334	3080	331	3110							
436.cactusADM	144	684	2520	680	2530	<u>681</u>	<u>2530</u>							
437.leslie3d	144	1258	1080	<u>1258</u>	<u>1080</u>	1255	1080							
444.namd	144	<u>534</u>	<u>2160</u>	535	2160	534	2160							
447.dealII	144	<u>418</u>	<u>3940</u>	420	3920	417	3950							
450.soplex	144	1046	1150	1048	1150	<u>1047</u>	<u>1150</u>							
453.povray	144	<u>232</u>	<u>3300</u>	233	3290	232	3310							
454.calculix	144	321	3700	322	3690	<u>322</u>	<u>3690</u>							
459.GemsFDTD	144	1555	983	1553	984	<u>1554</u>	<u>983</u>							
465.tonto	144	<u>618</u>	<u>2290</u>	618	2290	616	2300							
470.lbm	144	<u>999</u>	<u>1980</u>	1000	1980	999	1980							
481.wrf	144	859	1870	<u>860</u>	<u>1870</u>	860	1870							
482.sphinx3	144	1446	1940	<u>1448</u>	<u>1940</u>	1454	1930							

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"



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## Platform Notes

### BIOS Settings:

CPU performance set to Enterprise  
 Power Technology set to Energy Efficient  
 Energy Performance set to Balanced Performance  
 Memory RAS configuration set to Maximum Performance  
 Memory Power Saving Mode set to Disabled  
 QPI Snoop Mode set to Cluster-on-Die  
 Sysinfo program /opt/cpu2006-1.2/Docs/sysinfo  
 \$Rev: 6775 \$ \$Date:: 2011-08-16 #\$ 8787f7622badcf24e01c368b1db4377c  
 running on linux-23mz Sat Nov 12 16:28:55 2016

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 E7-8860 v4 @ 2.20GHz
 4 "physical id"s (chips)
 144 "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      : 18
siblings       : 36
physical 0:    : cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1:    : cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 2:    : cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 3:    : cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size     : 23040 KB
```

```
From /proc/meminfo
MemTotal:      529289248 kB
HugePages_Total: 0
Hugepagesize:  2048 kB
```

```
/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP1
```

```
From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 1
# This file is deprecated and will be removed in a future service pack or
release.
# Please check /etc/os-release for details about this release.
os-release:
NAME="SLES"
VERSION="12-SP1"
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
```

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## Platform Notes (Continued)

```
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

```
uname -a:
Linux linux-23mz 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Nov 12 16:22
```

```
SPEC is set to: /opt/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdb1       ext4  366G   35G  331G  10% /
```

(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 Intel Core i5-4670K CPU + 32GB
memory using RedHat EL 7.1
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/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

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## Base 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
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:

```

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

```

### C++ benchmarks:

```

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

```

### Fortran benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

```

### Benchmarks using both Fortran and C:

```

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

```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revE.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revE.xml>



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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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