



# SPEC® CINT2006 Result

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## Cisco Systems

Cisco UCS C220 M4 (Intel Xeon E5-2620 v4, 2.10 GHz)

**SPECint®2006 = 59.5**

**SPECint\_base2006 = 56.9**

**CPU2006 license:** 9019

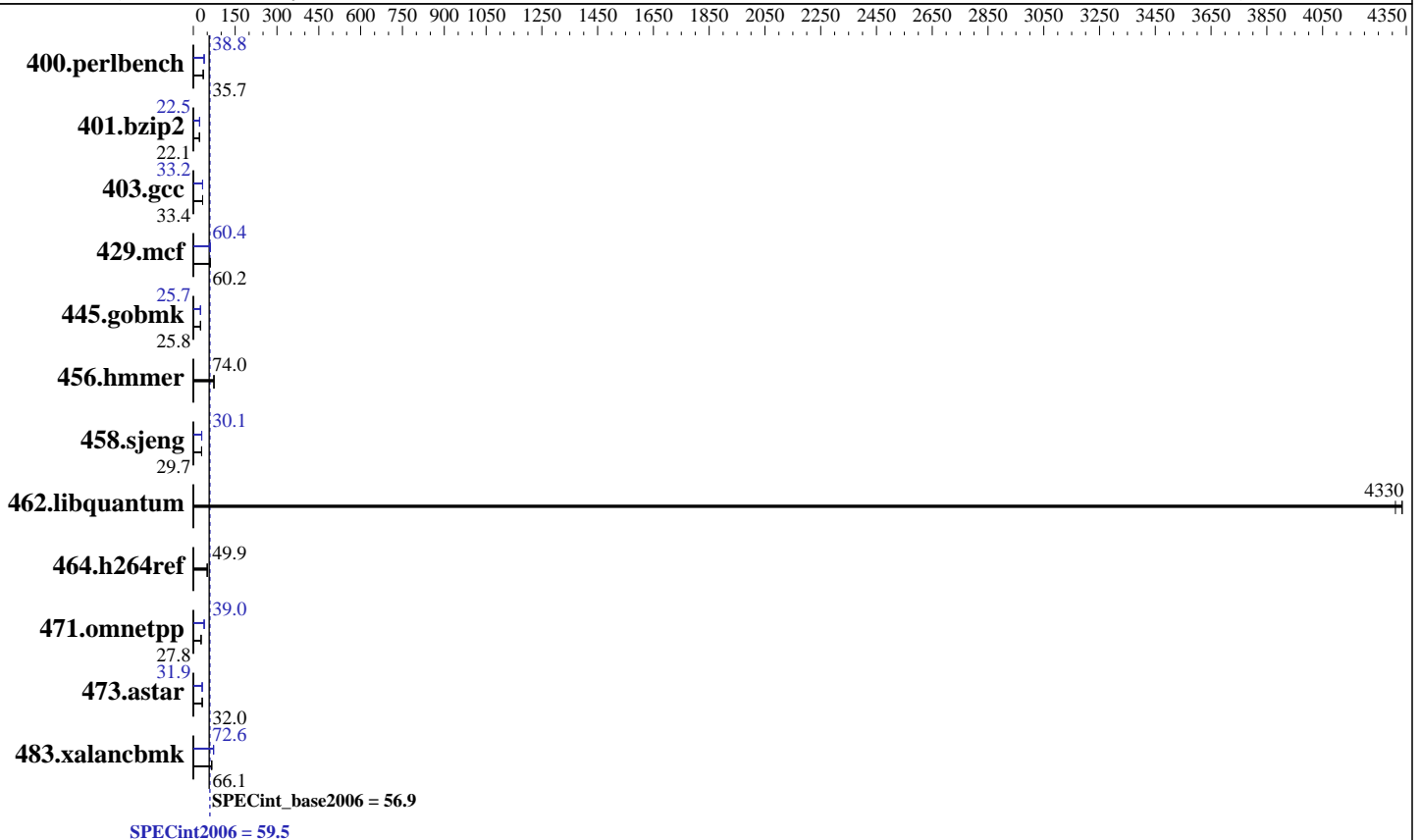
**Test sponsor:** Cisco Systems

**Tested by:** Cisco Systems

**Test date:** Aug-2016

**Hardware Availability:** Apr-2016

**Software Availability:** Dec-2015



### Hardware

**CPU Name:** Intel Xeon E5-2620 v4  
**CPU Characteristics:** Intel Turbo Boost Technology up to 3.00 GHz  
**CPU MHz:** 2100  
**FPU:** Integrated  
**CPU(s) enabled:** 16 cores, 2 chips, 8 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  
**L3 Cache:** 20 MB I+D on chip per chip  
**Other Cache:** None  
**Memory:** 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)  
**Disk Subsystem:** 1 x 300 GB SAS HDD, 15K RPM  
**Other Hardware:** None

### Software

**Operating System:** SUSE Linux Enterprise Server 12 SP1 (x86\_64) 3.12.49-11-default  
**Compiler:** C/C++; Version 16.0.0.101 of Intel C++ Studio XE for Linux  
**Auto Parallel:** Yes  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 32/64-bit  
**Peak Pointers:** 32/64-bit  
**Other Software:** Microquill SmartHeap V10.2



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## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	274	35.6	<b><u>274</u></b>	<b><u>35.7</u></b>	274	35.7	251	38.9	252	38.8	<b><u>252</u></b>	<b><u>38.8</u></b>
401.bzip2	436	22.1	<b><u>437</u></b>	<b><u>22.1</u></b>	439	22.0	<b><u>429</u></b>	<b><u>22.5</u></b>	429	22.5	429	22.5
403.gcc	241	33.4	241	33.4	<b><u>241</u></b>	<b><u>33.4</u></b>	243	33.2	<b><u>242</u></b>	<b><u>33.2</u></b>	242	33.3
429.mcf	<b><u>152</u></b>	<b><u>60.2</u></b>	150	60.6	152	60.0	152	60.0	150	60.9	<b><u>151</u></b>	<b><u>60.4</u></b>
445.gobmk	407	25.8	<b><u>406</u></b>	<b><u>25.8</u></b>	406	25.9	408	25.7	408	25.7	<b><u>408</u></b>	<b><u>25.7</u></b>
456.hammer	126	74.0	126	74.0	<b><u>126</u></b>	<b><u>74.0</u></b>	126	74.0	126	74.0	<b><u>126</u></b>	<b><u>74.0</u></b>
458.sjeng	407	29.7	407	29.8	<b><u>407</u></b>	<b><u>29.7</u></b>	<b><u>402</u></b>	<b><u>30.1</u></b>	402	30.1	402	30.1
462.libquantum	<b><u>4.78</u></b>	<b><u>4330</u></b>	4.81	4310	4.78	4340	<b><u>4.78</u></b>	<b><u>4330</u></b>	4.81	4310	4.78	4340
464.h264ref	443	50.0	443	49.9	<b><u>443</u></b>	<b><u>49.9</u></b>	443	50.0	443	49.9	<b><u>443</u></b>	<b><u>49.9</u></b>
471.omnetpp	226	27.7	<b><u>225</u></b>	<b><u>27.8</u></b>	224	27.8	161	38.8	<b><u>160</u></b>	<b><u>39.0</u></b>	160	39.0
473.astar	220	31.9	<b><u>219</u></b>	<b><u>32.0</u></b>	219	32.1	220	31.9	221	31.7	<b><u>220</u></b>	<b><u>31.9</u></b>
483.xalancbmk	105	65.5	<b><u>104</u></b>	<b><u>66.1</u></b>	104	66.1	95.1	72.6	<b><u>95.0</u></b>	<b><u>72.6</u></b>	95.0	72.6

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.

## Operating System Notes

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

## Platform Notes

### BIOS Settings:

```

Intel Hyper-Threading Technology option set to Disabled
CPU performance set to Enterprise
Power Technology set to Energy Efficient
Energy Performance BIAS setting set to Balanced Performance
Memory RAS configuration set to Maximum Performance
Memory Power Saving Mode set to Disabled
QPI Snoop Mode set to Home Directory Snoop with OSB
Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-6mvl Sun Aug 21 19:53:48 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 E5-2620 v4 @ 2.10GHz
2 "physical id"s (chips)

```

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### Platform Notes (Continued)

16 "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  : 8
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:      264569532 kB
HugePages_Total: 0
Hugepagesize:  2048 kB
```

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

```
uname -a:
Linux linux-6mvl 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 Aug 21 19:52
```

```
SPEC is set to: /opt/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal        xfs   279G   13G  267G   5% /
```

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Cisco Systems, Inc. C220M4.2.0.10c.0.032320160810 03/23/2016

Memory:  
16x 0xCE00 M393A2G40EB1-CRC 16 GB 2 rank 2400 MHz, configured at 2133 MHz  
8x NO DIMM NO DIMM

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## Platform Notes (Continued)

(End of data from sysinfo program)

## General Notes

Environment variables set by runspec before the start of the run:

KMP\_AFFINITY = "granularity=fine,compact"

LD\_LIBRARY\_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh"

OMP\_NUM\_THREADS = "16"

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

## Base Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

## Base Portability Flags

400.perlbench: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX\_X64  
401.bzip2: -DSPEC\_CPU\_LP64  
403.gcc: -DSPEC\_CPU\_LP64  
429.mcf: -DSPEC\_CPU\_LP64  
445.gobmk: -DSPEC\_CPU\_LP64  
456.hmmer: -DSPEC\_CPU\_LP64  
458.sjeng: -DSPEC\_CPU\_LP64  
462.libquantum: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX  
464.h264ref: -DSPEC\_CPU\_LP64  
471.omnetpp: -DSPEC\_CPU\_LP64  
473.astar: -DSPEC\_CPU\_LP64  
483.xalancbmk: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX

## Base Optimization Flags

C benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32  
-Wl,-z,muldefs -L/sh -lsmartheap64



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## Base Other Flags

C benchmarks:

403.gcc: -Dalloca=\_alloca

## Peak Compiler Invocation

C benchmarks (except as noted below):

icc -m64

400.perlbench: icc -m32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin

445.gobmk: icc -m32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin

C++ benchmarks (except as noted below):

icpc -m32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin

473.astar: icpc -m64

## Peak Portability Flags

400.perlbench: -D\_FILE\_OFFSET\_BITS=64 -DSPEC\_CPU\_LINUX\_IA32

401.bzip2: -DSPEC\_CPU\_LP64

403.gcc: -DSPEC\_CPU\_LP64

429.mcf: -DSPEC\_CPU\_LP64

445.gobmk: -D\_FILE\_OFFSET\_BITS=64

456.hmmmer: -DSPEC\_CPU\_LP64

458.sjeng: -DSPEC\_CPU\_LP64

462.libquantum: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX

464.h264ref: -DSPEC\_CPU\_LP64

471.omnetpp: -D\_FILE\_OFFSET\_BITS=64

473.astar: -DSPEC\_CPU\_LP64

483.xalancbmk: -D\_FILE\_OFFSET\_BITS=64 -DSPEC\_CPU\_LINUX

## Peak Optimization Flags

C benchmarks:

400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch  
-ansi-alias

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div  
-par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32

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## Peak Optimization Flags (Continued)

401.bzip2 (continued):

-opt-prefetch -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc

-opt-malloc-options=3 -auto-ilp32

429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel

-opt-prefetch -auto-p32

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)

-prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias

456.hmmr: basepeak = yes

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)

-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)

-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)

-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)

-par-num-threads=1(pass 1) -prof-use(pass 2)

-opt-ra-region-strategy=block

-ansi-alias

-Wl,-z,muldefs -L/sh -lsmartheap

473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

-auto-p32 -Wl,-z,muldefs -L/sh -lsmartheap64

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

-ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap

## Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=\_alloca

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

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html>

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



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<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

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

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