# SPEC® CINT2006 Result

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Bronze 3104, 1.70 GHz)

SPECint®2006 =        36.7

SPECint_base2006 =        35.6

| | |
|---|---|
| **CPU2006 license:** 9019 | **Test date:** Dec-2017 |
| **Test sponsor:** Cisco Systems | **Hardware Availability:** Aug-2017 |
| **Tested by:** Cisco Systems | **Software Availability:** Jun-2017 |

0   100   200   300   400   500   600   700   800   900   1000        1150        1300        1450        1600        1750        1900        2050        2200        2350        2500        2750

```
400.perlbench      24.8
                   21.8
401.bzip2      13.7
               13.7
403.gcc      22.8
             22.3
429.mcf      43.6
             43.6
445.gobmk      15.3
               15.2
456.hmmer      44.4
458.sjeng      18.1
               17.7
462.libquantum                                                                                     2710
464.h264ref      31.8
471.omnetpp      21.6
                 18.4
473.astar      18.1
               18.3
483.xalancbmk      42.7
                   41.1
```

**SPECint_base2006 = 35.6**

**SPECint2006 = 36.7**

### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon Bronze 3104 |
| CPU Characteristics: | |
| CPU MHz: | 1700 |
| FPU: | Integrated |
| CPU(s) enabled: | 12 cores, 2 chips, 6 cores/chip |
| CPU(s) orderable: | 1,2 chips |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 1 MB I+D on chip per core |
| L3 Cache: | 8.25 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R, running at 2133) |
| Disk Subsystem: | 1 x 1 TB SAS HDD, 7.2K RPM |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 7.3 (Maipo) 3.10.0-514.el7.x86_64 |
| Compiler: | C/C++: Version 17.0.3.191 of Intel C/C++ Compiler 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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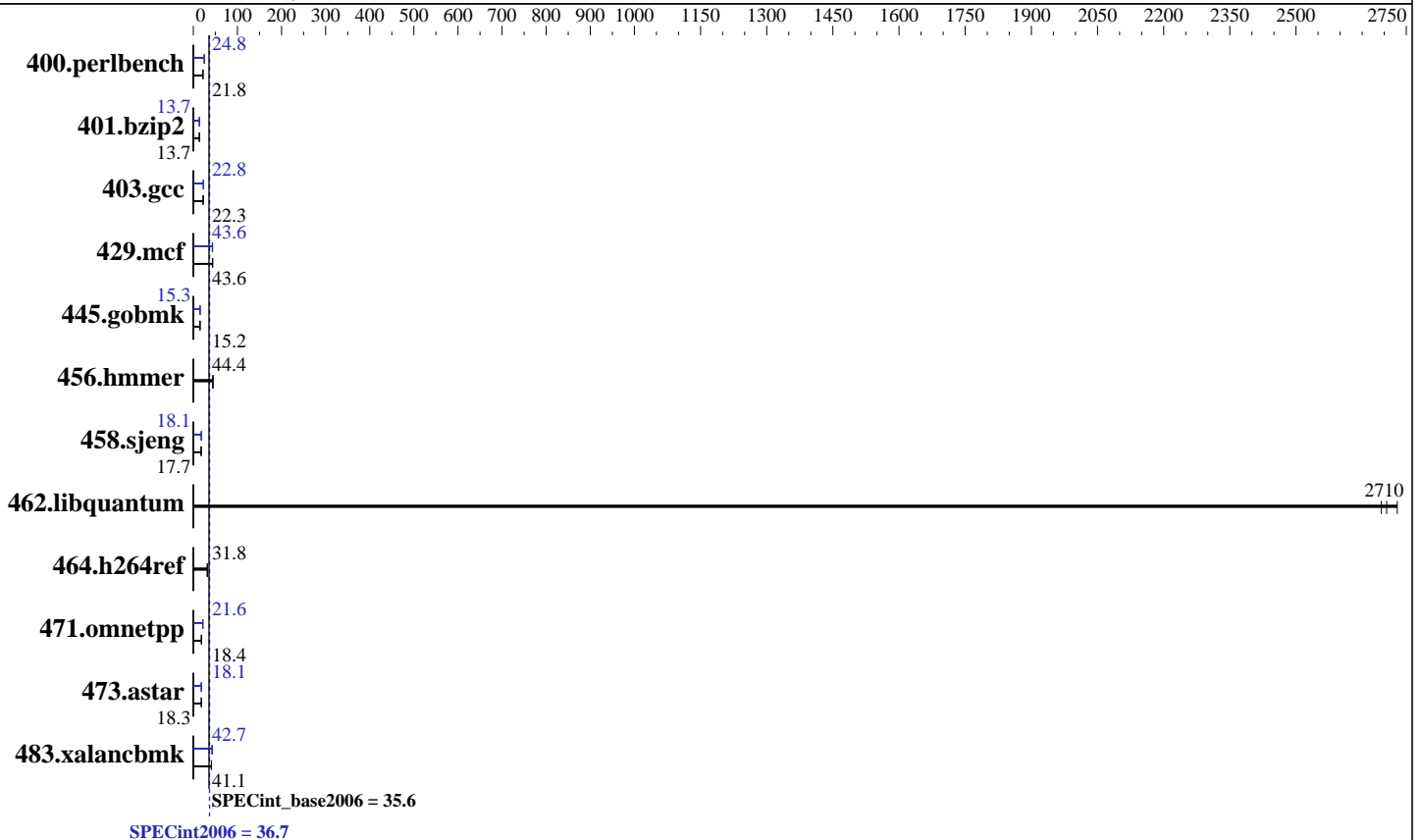SPECint2006 = 36.7

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**CPU2006 license:** 9019
**Test sponsor:** Cisco Systems
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**Test date:** Dec-2017
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### Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 447 | 21.9 | **448** | **21.8** | 449 | 21.8 | 394 | 24.8 | **393** | **24.8** | 393 | 24.8 |
| 401.bzip2 | 705 | 13.7 | 707 | 13.7 | **706** | **13.7** | 703 | 13.7 | **704** | **13.7** | 704 | 13.7 |
| 403.gcc | 361 | 22.3 | 361 | 22.3 | **361** | **22.3** | 353 | 22.8 | 354 | 22.7 | **353** | **22.8** |
| 429.mcf | **209** | **43.6** | 211 | 43.2 | 207 | 44.0 | 209 | 43.6 | **209** | **43.6** | 212 | 42.9 |
| 445.gobmk | 691 | 15.2 | **691** | **15.2** | 691 | 15.2 | 684 | 15.3 | 684 | 15.3 | **684** | **15.3** |
| 456.hmmer | **210** | **44.4** | 210 | 44.4 | 210 | 44.5 | **210** | **44.4** | 210 | 44.4 | 210 | 44.5 |
| 458.sjeng | 682 | 17.7 | **682** | **17.7** | 682 | 17.7 | 669 | 18.1 | **669** | **18.1** | 669 | 18.1 |
| 462.libquantum | **7.66** | **2710** | 7.59 | 2730 | 7.69 | 2690 | **7.66** | **2710** | 7.59 | 2730 | 7.69 | 2690 |
| 464.h264ref | **696** | **31.8** | 695 | 31.9 | 697 | 31.8 | **696** | **31.8** | 695 | 31.9 | 697 | 31.8 |
| 471.omnetpp | 340 | 18.4 | 340 | 18.4 | **340** | **18.4** | 289 | 21.7 | **289** | **21.6** | 290 | 21.6 |
| 473.astar | 384 | 18.3 | 386 | 18.2 | **385** | **18.3** | 386 | 18.2 | **387** | **18.1** | 388 | 18.1 |
| 483.xalancbmk | 168 | 41.0 | 168 | 41.1 | **168** | **41.1** | 162 | 42.5 | 162 | 42.7 | **162** | **42.7** |

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:
    CPU performance set to Enterprise
    Power Performance Tuning set to OS Controls
    SNC set to Disabled
    Patrol Scrub set to Disabled
     Sysinfo program /home/cpu2006-1.2/config/sysinfo.rev6993
     Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
     running on c220m5-spec Mon Dec 18 02:01:36 2017

     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) Bronze 3104 CPU @ 1.70GHz
           2 "physical id"s (chips)
           12 "processors"
        cores, siblings (Caution: counting these is hw and system dependent.  The
        following excerpts from /proc/cpuinfo might not be reliable.  Use with
```

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## Platform Notes (Continued)

```
    caution.)
       cpu cores : 6
       siblings  : 6
       physical 0: cores 0 1 2 3 4 5
       physical 1: cores 0 1 2 3 4 5
    cache size : 8448 KB

From /proc/meminfo
   MemTotal:       394679120 kB
   HugePages_Total:        0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.3 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.3"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

uname -a:
   Linux c220m5-spec 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 18 01:57

SPEC is set to: /home/cpu2006-1.2
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda5      xfs   689G   12G  678G   2% /home
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. C220M5.3.1.1d.0.0615170645 06/15/2017Cisco Systems,
  Inc. C220M5.3.1.1d.0.0615170645 06/15/2017
  Memory:
   48x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz, configured at 2133 MHz

(End of data from sysinfo program)
The correct amount of Memory installed is 384 GB (24 x 16 GB)
and the dmidecode is reporting invalid number of DIMMs installed
Installed Memory:
24x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz
```

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**Tested by:** Cisco Systems

**Test date:** Dec-2017

**Hardware Availability:** Aug-2017

**Software Availability:** Jun-2017

## General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2006-1.2/lib/ia32:/home/cpu2006-1.2/lib/intel64:/home/cpu2006-1.2/sh10.2"
OMP_NUM_THREADS = "12"

 Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.2
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
 No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
 is mitigated in the system as tested and documented.
 No: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
 is mitigated in the system as tested and documented.
 No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
 is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on
past performance using the historical hardware and/or
software described on this result page.

The system as described on this result page was formerly
generally available.  At the time of this publication, it may
not be shipping, and/or may not be supported, and/or may fail
to meet other tests of General Availability described in the
SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result
that would be measured were this benchmark run with hardware
and software available as of the publication date.
```

## 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

Continued on next page

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## Base Portability Flags (Continued)

```
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 -qopt-prefetch
-auto-p32
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-Wl,-z,muldefs -L/sh10.2 -lsmartheap64
```

## 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_2017/linux/lib/ia32
```

```
   445.gobmk: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

C++ benchmarks (except as noted below):
```
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

```
   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
```

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| | | | |
|---|---|---|---|
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| **Test sponsor:** | Cisco Systems | **Hardware Availability:** | Aug-2017 |
| **Tested by:** | Cisco Systems | **Software Availability:** | Jun-2017 |

# Peak Portability Flags (Continued)

```
       429.mcf: -DSPEC_CPU_LP64
     445.gobmk: -D_FILE_OFFSET_BITS=64
     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: -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: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
                 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
                 -no-prec-div(pass 2) -qopt-prefetch

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

       403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc
                 -qopt-malloc-options=3 -auto-ilp32

       429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
                 -qopt-prefetch -auto-p32

     445.gobmk: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
                 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
                 -no-prec-div(pass 2)

     456.hmmer: basepeak = yes

      458.sjeng: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
                 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
                 -no-prec-div(pass 2) -unroll4

  462.libquantum: basepeak = yes

    464.h264ref: basepeak = yes
```

C++ benchmarks:

```
    471.omnetpp: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
                 -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
                 -no-prec-div(pass 2) -qopt-ra-region-strategy=block
                 -Wl,-z,muldefs -L/sh10.2 -lsmartheap
```

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# Peak Optimization Flags (Continued)

```
473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
           -auto-p32 -Wl,-z,muldefs -L/sh10.2 -lsmartheap64

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
               -Wl,-z,muldefs -L/sh10.2 -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-ic17.0-official-linux64-revF.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revH.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-revF.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revH.xml

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

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