SPEC® CINT2006 Result
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Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Silver 4108, 1.80 GHz)

SPECint®_rate2006 =   702
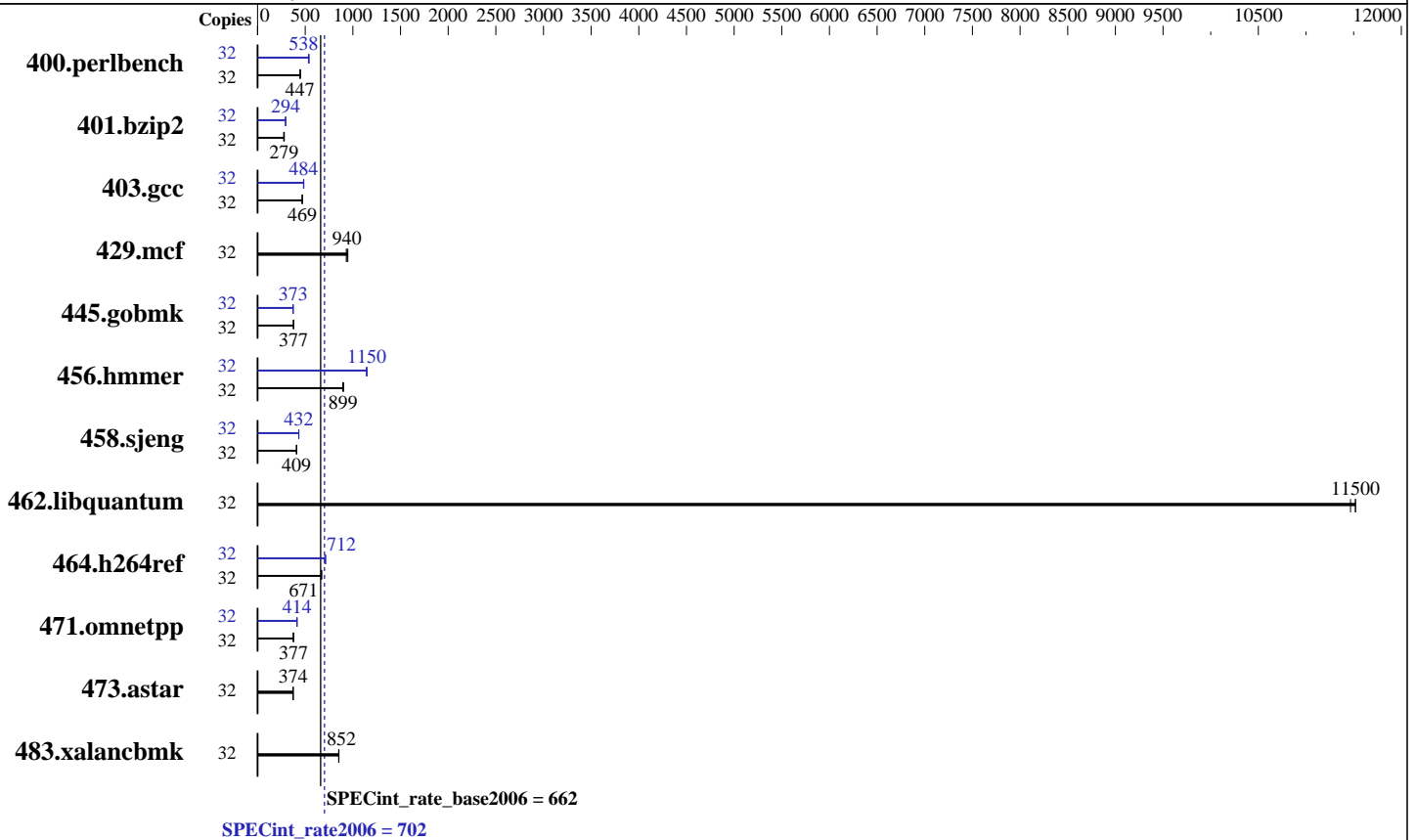
SPECint_rate_base2006 =   662

CPU2006 license: 9019

Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Dec-2017

Hardware Availability: Aug-2017

Software Availability: Jun-2017

Copies

Benchmark	Result values
400.perlbench	32: 538 / 32: 447
401.bzip2	32: 294 / 32: 279
403.gcc	32: 484 / 32: 469
429.mcf	32: 940
445.gobmk	32: 373 / 32: 377
456.hmmer	32: 1150 / 32: 899
458.sjeng	32: 432 / 32: 409
462.libquantum	32: 11500
464.h264ref	32: 712 / 32: 671
471.omnetpp	32: 414 / 32: 377
473.astar	32: 374
483.xalancbmk	32: 852

SPECint_rate_base2006 = 662

SPECint_rate2006 = 702

Hardware

CPU Name:	Intel Xeon Silver 4108
CPU Characteristics:	Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz:	1800
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:	1 MB I+D on chip per core
L3 Cache:	11 MB I+D on chip per chip
Other Cache:	None
Memory:	384 GB (24 x 16 GB 2Rx4 PC4-2666V-R, running at 2400)
Disk Subsystem:	1 x 600 GB SAS HDD, 10K RPM
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.21-69-default
Compiler:	C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran
Auto Parallel:	Yes
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	32	**699**	**447**	699	447	696	449	32	586	534	579	540	**581**	**538**
401.bzip2	32	1102	280	**1107**	**279**	1126	274	32	1048	295	1053	293	**1052**	**294**
403.gcc	32	549	469	**549**	**469**	550	468	32	535	482	**533**	**484**	531	485
429.mcf	32	308	947	**311**	**940**	314	931	32	308	947	**311**	**940**	314	931
445.gobmk	32	890	377	891	377	**890**	**377**	32	**900**	**373**	901	373	900	373
456.hmmer	32	331	903	334	894	**332**	**899**	32	**261**	**1150**	260	1150	261	1140
458.sjeng	32	948	409	**947**	**409**	946	409	32	**896**	**432**	896	432	892	434
462.libquantum	32	**57.6**	**11500**	57.8	11500	57.6	11500	32	**57.6**	**11500**	57.8	11500	57.6	11500
464.h264ref	32	**1055**	**671**	1059	669	1053	672	32	991	714	1003	706	**994**	**712**
471.omnetpp	32	533	375	531	377	**531**	**377**	32	484	413	**483**	**414**	483	414
473.astar	32	599	375	**601**	**374**	606	371	32	599	375	**601**	**374**	606	371
483.xalancbmk	32	259	854	**259**	**852**	259	852	32	259	854	**259**	**852**	259	852

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

```
BIOS Settings:
Intel HyperThreading Technology set to Enabled
CPU performance set to Enterprise
Power Performance Tuning set to OS Controls
SNC set to Enabled
IMC Interleaving set to 1-way Interleave
Patrol Scrub set to Disabled
 Sysinfo program /home/cpu2006-1.2/config/sysinfo.rev6993
 Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
 running on linux-3joc Thu Dec 14 05:51:54 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) Silver 4108 CPU @ 1.80GHz
```

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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 : 11264 KB

From /proc/meminfo
  MemTotal:       394864760 kB
  HugePages_Total:        0
  Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
  SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
  SuSE-release:
     SUSE Linux Enterprise Server 12 (x86_64)
     VERSION = 12
     PATCHLEVEL = 2
     # 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-SP2"
     VERSION_ID="12.2"
     PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
     ID="sles"
     ANSI_COLOR="0;32"
     CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux linux-3joc 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
  (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 14 03:38

SPEC is set to: /home/cpu2006-1.2
  Filesystem      Type  Size  Used Avail Use% Mounted on
  /dev/sda3       xfs   516G  114G  403G  22% /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.
```

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Platform Notes (Continued)

```
    BIOS Cisco Systems, Inc. C220M5.3.1.1d.0.0615170645 06/15/2017
    Memory:
     24x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz, configured at 2400 MHz

   (End of data from sysinfo program)
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/opt/intel/lib/ia32:/opt/intel/lib/intel64:/home/cpu2006-1.2/sh10.2"

  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
  Filesystem page cache cleared with:
  shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
  runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>
 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 -m32 -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
```

C++ benchmarks:
```
    icpc -m32 -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
```

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Base Portability Flags

```
       400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
          401.bzip2: -D_FILE_OFFSET_BITS=64
            403.gcc: -D_FILE_OFFSET_BITS=64
            429.mcf: -D_FILE_OFFSET_BITS=64
          445.gobmk: -D_FILE_OFFSET_BITS=64
          456.hmmer: -D_FILE_OFFSET_BITS=64
          458.sjeng: -D_FILE_OFFSET_BITS=64
      462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
         464.h264ref: -D_FILE_OFFSET_BITS=64
         471.omnetpp: -D_FILE_OFFSET_BITS=64
           473.astar: -D_FILE_OFFSET_BITS=64
       483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:
```
    -xHOST -ipo -O3 -no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3
```

C++ benchmarks:
```
    -xHOST -ipo -O3 -no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3
    -Wl,-z,muldefs -L/home/cpu2006-1.2/sh10.2 -lsmartheap
```

Base Other Flags

C benchmarks:

```
    403.gcc: -Dalloca=_alloca
```

Peak Compiler Invocation

C benchmarks (except as noted below):
```
    icc -m32 -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
```

```
    400.perlbench: icc -m64
```

```
       401.bzip2: icc -m64
```

```
     456.hmmer: icc -m64
```

```
      458.sjeng: icc -m64
```

C++ benchmarks:
```
    icpc -m32 -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
```

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Peak Portability Flags

```
400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
   401.bzip2: -DSPEC_CPU_LP64
    403.gcc: -D_FILE_OFFSET_BITS=64
    429.mcf: -D_FILE_OFFSET_BITS=64
  445.gobmk: -D_FILE_OFFSET_BITS=64
  456.hmmer: -DSPEC_CPU_LP64
   458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
  464.h264ref: -D_FILE_OFFSET_BITS=64
  471.omnetpp: -D_FILE_OFFSET_BITS=64
   473.astar: -D_FILE_OFFSET_BITS=64
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) -xHOST(pass 2)
              -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -auto-ilp32 -qopt-mem-layout-trans=3

   401.bzip2: -prof-gen(pass 1) -prof-use(pass 2) -xHOST(pass 2)
              -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -qopt-prefetch -auto-ilp32
              -qopt-mem-layout-trans=3

     403.gcc: -xHOST -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3

     429.mcf: basepeak = yes

   445.gobmk: -prof-gen(pass 1) -prof-use(pass 2) -xHOST(pass 2)
              -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -qopt-mem-layout-trans=3

   456.hmmer: -xHOST -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
              -qopt-mem-layout-trans=3

    458.sjeng: -prof-gen(pass 1) -prof-use(pass 2) -xHOST(pass 2)
              -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -unroll4 -auto-ilp32
              -qopt-mem-layout-trans=3

462.libquantum: basepeak = yes

   464.h264ref: -prof-gen(pass 1) -prof-use(pass 2) -xHOST(pass 2)
              -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -unroll2 -qopt-mem-layout-trans=3
```

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Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-xHOST`(pass 2)
`-par-num-threads=1`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
`-no-prec-div`(pass 2)
`-qopt-ra-region-strategy=block`
`-qopt-mem-layout-trans=3 -Wl,-z,muldefs`
`-L/home/cpu2006-1.2/sh10.2 -lsmartheap`

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

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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