SPEC® CINT2006 Result

Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8168, 2.70GHz)

SPECint®_rate2006 = 2630

SPECint_rate_base2006 = 2530

CPU2006 license: 9019
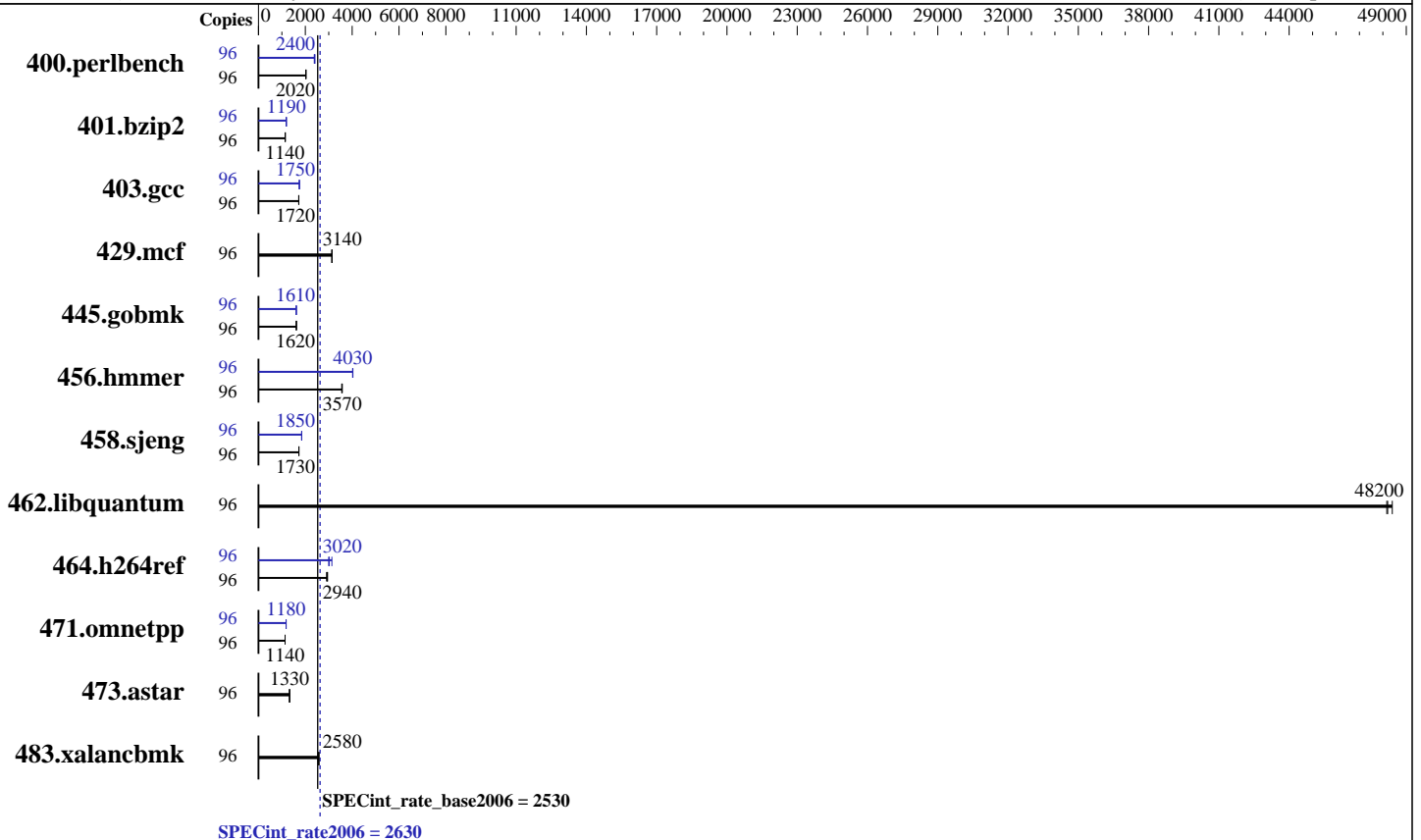**Test sponsor:** Cisco Systems
Tested by: Cisco Systems

Test date: Jun-2017
Hardware Availability: Aug-2017
Software Availability: Sep-2017

Benchmark	Copies	Base	Peak
400.perlbench	96 / 96	2020	2400
401.bzip2	96 / 96	1140	1190
403.gcc	96 / 96	1720	1750
429.mcf	96	3140	
445.gobmk	96 / 96	1620	1610
456.hmmer	96 / 96	3570	4030
458.sjeng	96 / 96	1730	1850
462.libquantum	96	48200	
464.h264ref	96 / 96	2940	3020
471.omnetpp	96 / 96	1140	1180
473.astar	96	1330	
483.xalancbmk	96	2580	

SPECint_rate_base2006 = 2530

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Hardware

CPU Name:	Intel Xeon Platinum 8168
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	2700
FPU:	Integrated
CPU(s) enabled:	48 cores, 2 chips, 24 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:	33 MB I+D on chip per chip
Other Cache:	None
Memory:	384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)
Disk Subsystem:	1 x 600 GB SAS 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 18.0.0.082 of Intel C/C++ Beta Compiler for Linux
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	96	462	2030	464	2020	**464**	**2020**	96	394	2380	389	2410	**391**	**2400**
401.bzip2	96	808	1150	**812**	**1140**	815	1140	96	781	1190	**780**	**1190**	779	1190
403.gcc	96	**449**	**1720**	448	1720	450	1720	96	**442**	**1750**	443	1740	442	1750
429.mcf	96	**279**	**3140**	279	3130	279	3140	96	**279**	**3140**	279	3130	279	3140
445.gobmk	96	623	1620	622	1620	**623**	**1620**	96	624	1610	**624**	**1610**	624	1610
456.hmmer	96	252	3550	**251**	**3570**	250	3580	96	**222**	**4030**	222	4030	223	4020
458.sjeng	96	673	1730	**673**	**1730**	673	1730	96	**629**	**1850**	630	1850	629	1850
462.libquantum	96	41.3	48200	**41.3**	**48200**	41.1	48400	96	41.3	48200	**41.3**	**48200**	41.1	48400
464.h264ref	96	**724**	**2940**	720	2950	731	2910	96	678	3130	**704**	**3020**	709	3000
471.omnetpp	96	**528**	**1140**	528	1140	528	1140	96	509	1180	509	1180	**509**	**1180**
473.astar	96	507	1330	508	1330	**508**	**1330**	96	507	1330	508	1330	**508**	**1330**
483.xalancbmk	96	257	2580	**257**	**2580**	258	2570	96	257	2580	**257**	**2580**	258	2570

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
    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-0fck Sun Jul 2 21:22:55 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) Platinum 8168 CPU @ 2.70GHz

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Platform Notes (Continued)

```
     2 "physical id"s (chips)
     96 "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 : 24
     siblings  : 48
     physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
     27 28 29
     physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
     27 28 29
  cache size : 33792 KB

From /proc/meminfo
  MemTotal:       394864132 kB
  HugePages_Total:        0
  Hugepagesize:        2048 kB

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-0fck 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 Jul 2 01:04

SPEC is set to: /home/cpu2006-1.2
  Filesystem      Type  Size  Used Avail Use% Mounted on
  /dev/sda2       xfs   500G   19G  482G   4% /
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 06/15/2017
```

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Platform Notes (Continued)

```
    Memory:
     24x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 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/compilers_and_libraries_2018.0.082/linux/compiler/lib/ia32:/opt/intel/compilers_and_libraries_2018.0.082/linux/compiler/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>
```

Base Compiler Invocation

C benchmarks:
```
    icc -m32 -L/opt/intel/compilers_and_libraries_2018.0.082/linux/lib/ia32
```

C++ benchmarks:
```
    icpc -m32 -L/opt/intel/compilers_and_libraries_2018.0.082/linux/lib/ia32
```

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
```

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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_2018.0.082/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_2018.0.082/linux/lib/ia32
```

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`

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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`

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

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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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