SPEC® CINT2006 Result
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Cisco Systems

Cisco UCS B480 M5 (Intel Xeon Gold 6148, 2.40 GHz)

SPECint®_rate2006 =   4060
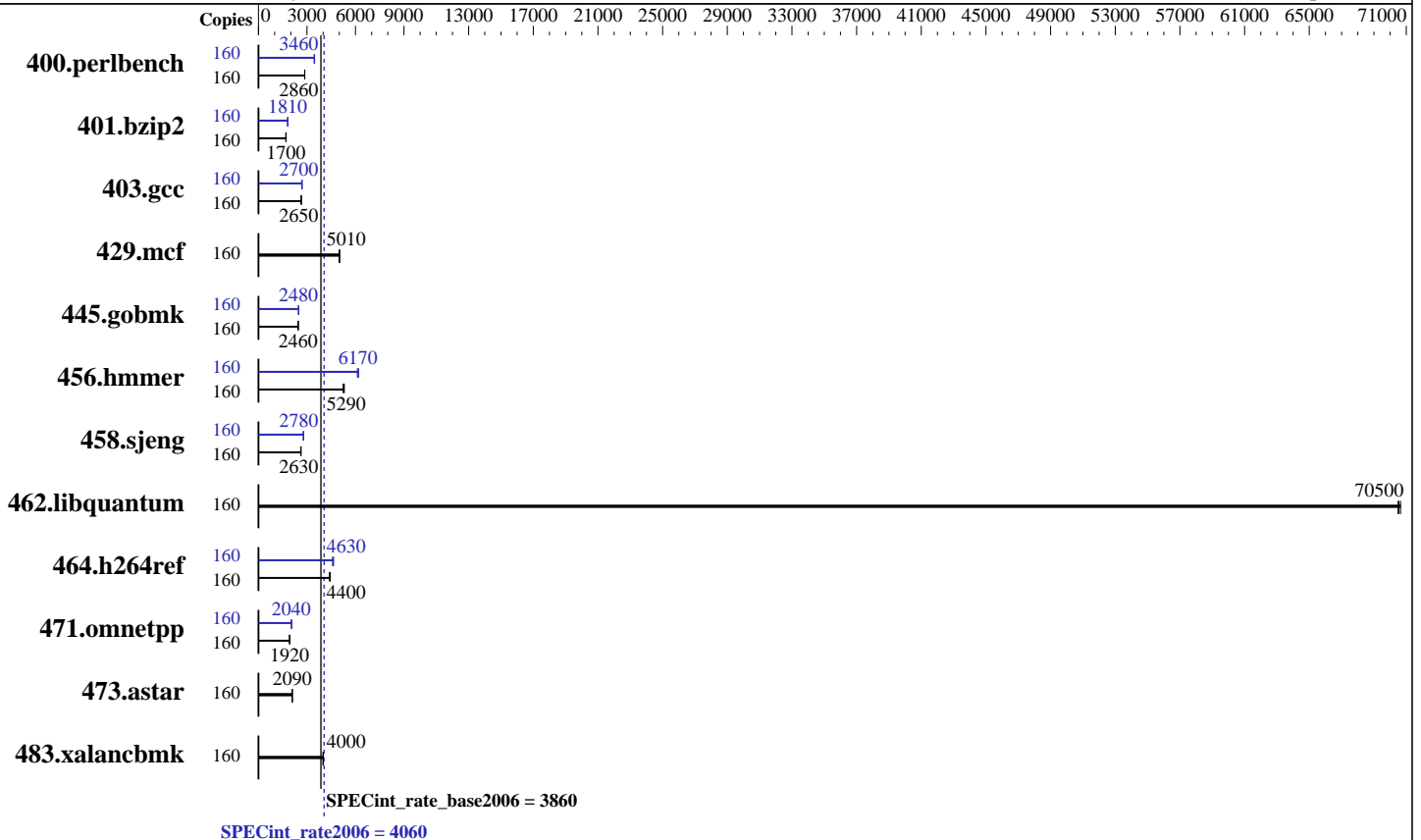
SPECint_rate_base2006 = 3860

CPU2006 license: 9019

Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Nov-2017

Hardware Availability: Aug-2017

Software Availability: Sep-2017

Copies

Benchmark	Peak	Base
400.perlbench	3460	2860
401.bzip2	1810	1700
403.gcc	2700	2650
429.mcf		5010
445.gobmk	2480	2460
456.hmmer	6170	5290
458.sjeng	2780	2630
462.libquantum		70500
464.h264ref	4630	4400
471.omnetpp	2040	1920
473.astar		2090
483.xalancbmk		4000

SPECint_rate_base2006 = 3860

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Hardware

CPU Name:	Intel Xeon Gold 6148
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	80 cores, 4 chips, 20 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:	1 MB I+D on chip per core
L3 Cache:	27.5 MB I+D on chip per chip
Other Cache:	None
Memory:	768 GB (48 x 16 GB 2Rx4 PC4-2666V-R)
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	160	547	2860	546	2860	**546**	**2860**	160	453	3450	**452**	**3460**	450	3470
401.bzip2	160	901	1710	**907**	**1700**	912	1690	160	855	1810	**854**	**1810**	851	1810
403.gcc	160	486	2650	**486**	**2650**	488	2640	160	477	2700	**478**	**2700**	482	2670
429.mcf	160	293	4990	290	5030	**291**	**5010**	160	293	4990	290	5030	**291**	**5010**
445.gobmk	160	681	2470	**683**	**2460**	684	2450	160	676	2480	**677**	**2480**	677	2480
456.hmmer	160	**282**	**5290**	285	5230	281	5310	160	**242**	**6170**	241	6190	244	6110
458.sjeng	160	736	2630	**737**	**2630**	738	2620	160	696	2780	697	2780	**696**	**2780**
462.libquantum	160	46.9	70600	47.0	70500	**47.0**	**70500**	160	46.9	70600	47.0	70500	**47.0**	**70500**
464.h264ref	160	**804**	**4400**	796	4450	805	4400	160	764	4640	773	4580	**764**	**4630**
471.omnetpp	160	520	1920	519	1930	**520**	**1920**	160	487	2050	490	2040	**490**	**2040**
473.astar	160	537	2090	**537**	**2090**	538	2090	160	537	2090	**537**	**2090**	538	2090
483.xalancbmk	160	276	3990	**276**	**4000**	275	4010	160	276	3990	**276**	**4000**	275	4010

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 /opt/cpu2006-1.2/config/sysinfo.rev6993
     Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
     running on linux-qiwr Thu Nov 23 13:41:37 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) Gold 6148 CPU @ 2.40GHz
```

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Platform Notes (Continued)

```
    4 "physical id"s (chips)
    160 "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 : 20
    siblings  : 40
    physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    physical 3: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  cache size : 28160 KB

From /proc/meminfo
  MemTotal:       791026932 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-qiwr 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 31 20:21

SPEC is set to: /opt/cpu2006-1.2
  Filesystem      Type   Size  Used Avail Use% Mounted on
  /dev/sda1       xfs    280G  111G  169G  40% /
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. B480M5.3.2.2a.0.0919171641 09/19/2017
```

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Platform Notes (Continued)

```
    Memory:
     48x 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/lib/ia32:/opt/intel/lib/intel64:/opt/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/opt/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/opt/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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