SPEC® CINT2006 Result
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Cisco Systems

Cisco UCS C480 M5 (Intel Xeon Platinum 8170, 2.10GHz)

SPECint®2006 = 81.5
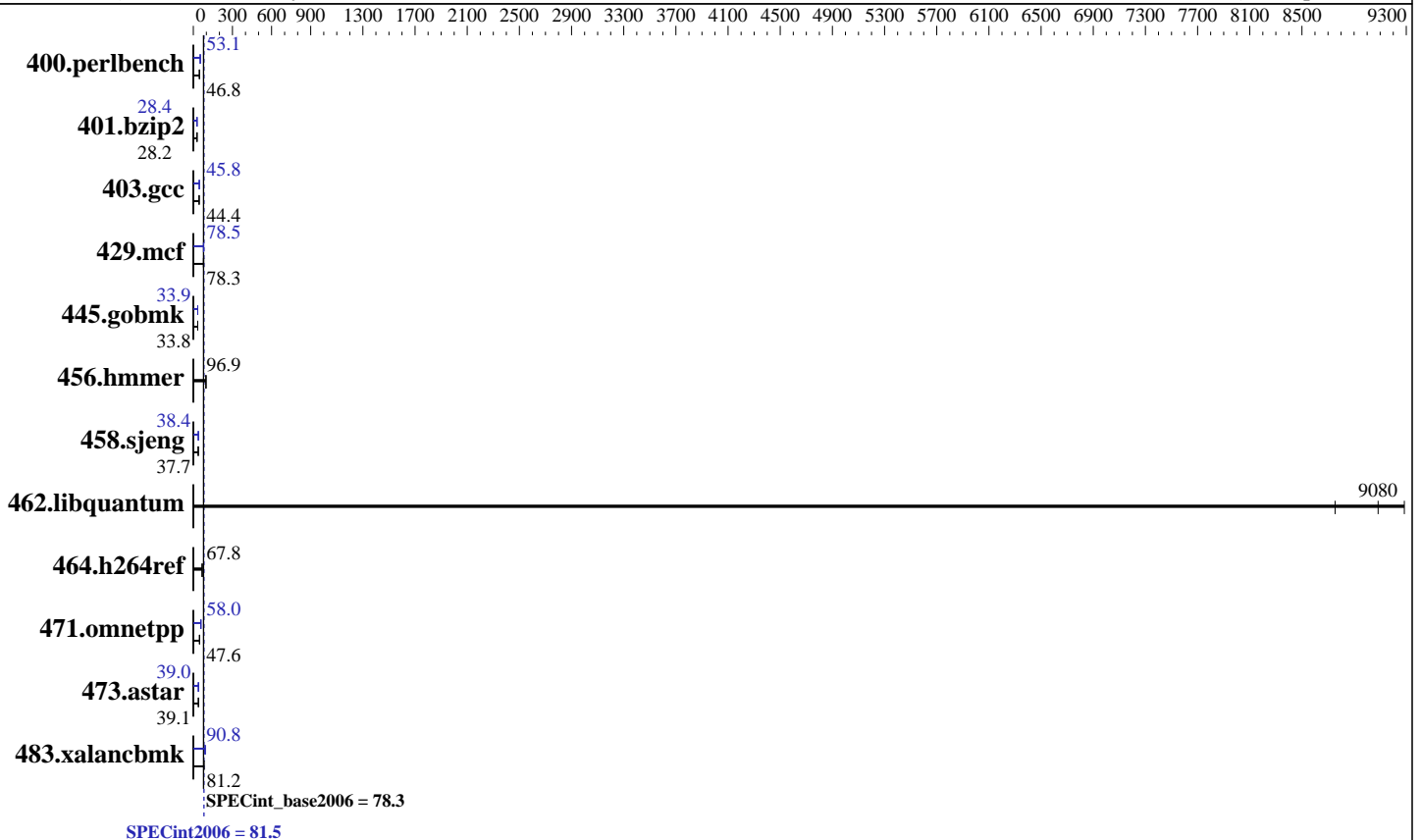
SPECint_base2006 = 78.3

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

Test date: Aug-2017
Hardware Availability: Aug-2017
Software Availability: Apr-2017

Benchmark	Base	Peak
400.perlbench	46.8	53.1
401.bzip2	28.2	28.4
403.gcc	44.4	45.8
429.mcf	78.3	78.5
445.gobmk	33.8	33.9
456.hmmer	96.9	
458.sjeng	37.7	38.4
462.libquantum	9080	
464.h264ref	67.8	
471.omnetpp	47.6	58.0
473.astar	39.1	39.0
483.xalancbmk	81.2	90.8

SPECint_base2006 = 78.3
SPECint2006 = 81.5

Hardware

CPU Name:	Intel Xeon Platinum 8170
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	2100
FPU:	Integrated
CPU(s) enabled:	104 cores, 4 chips, 26 cores/chip
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:	35.75 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 10K 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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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	208	47.0	209	46.7	**209**	**46.8**	184	53.2	184	53.1	**184**	**53.1**
401.bzip2	342	28.2	342	28.2	**342**	**28.2**	339	28.5	**340**	**28.4**	340	28.4
403.gcc	181	44.5	181	44.4	**181**	**44.4**	**176**	**45.8**	176	45.7	176	45.8
429.mcf	**117**	**78.3**	117	78.0	113	80.4	114	79.7	116	78.3	**116**	**78.5**
445.gobmk	310	33.8	**310**	**33.8**	310	33.8	**310**	**33.9**	310	33.9	310	33.9
456.hmmer	96.2	97.0	96.8	96.4	**96.3**	**96.9**	96.2	97.0	96.8	96.4	**96.3**	**96.9**
458.sjeng	321	37.7	321	37.7	**321**	**37.7**	315	38.4	**315**	**38.4**	315	38.4
462.libquantum	**2.28**	**9080**	2.37	8750	2.23	9290	**2.28**	**9080**	2.37	8750	2.23	9290
464.h264ref	**326**	**67.8**	326	67.9	326	67.8	**326**	**67.8**	326	67.9	326	67.8
471.omnetpp	132	47.5	**131**	**47.6**	131	47.9	108	58.1	108	58.0	**108**	**58.0**
473.astar	179	39.1	180	39.1	**180**	**39.1**	180	38.9	**180**	**39.0**	180	39.0
483.xalancbmk	85.0	81.1	85.0	81.2	**85.0**	**81.2**	**76.0**	**90.8**	76.2	90.5	75.9	90.9

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 HyperThreading Technology set to Disabled
CPU performance set to Enterprise
Power Performance Tuning set to OS
SNC set to Disabled
IMC Interleaving set to Auto
Patrol Scrub set to Disabled
 Sysinfo program /home/cpu2006-1.2/config/sysinfo.rev6993
 Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
 running on Plumas2-127.128 Thu Aug  3 02:32:52 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 8170 CPU @ 2.10GHz
       4 "physical id"s (chips)
       104 "processors"
```

Continued on next page

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Platform Notes (Continued)

```
    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 : 26
       siblings  : 26
       physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
       26 27 28 29
       physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
       26 27 28 29
       physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
       26 27 28 29
       physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
       26 27 28 29
    cache size : 36608 KB

  From /proc/meminfo
     MemTotal:       790981284 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=OpenStack
        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 Plumas2-127.128 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 Aug 3 01:56

  SPEC is set to: /home/cpu2006-1.2
     Filesystem      Type   Size   Used Avail Use% Mounted on
     /dev/sdb5       xfs    503G    65G  438G  13% /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. C480M5.3.1.0.248.0518171057 05/18/2017Cisco Systems,
     Inc. C480M5.3.1.0.248.0518171057 05/18/2017
```

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Platform Notes (Continued)

```
    Memory:
     96x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz

   (End of data from sysinfo program)
   The correct amount of Memory installed is 768 GB (48 x 16 GB)
   and the dmidecode is reporting invalid number of DIMMs installed
   Installed Memory:
   48x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz
```

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 = "104"

 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
```

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
```

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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
    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
```

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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`

> 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:

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Peak Other Flags (Continued)

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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