SPEC® CINT2006 Result
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Huawei

Huawei 2288H V5 (Intel Xeon Gold 6142)

$SPECint^®\_rate2006 =$ 1800

$SPECint\_rate\_base2006 =$ 1700

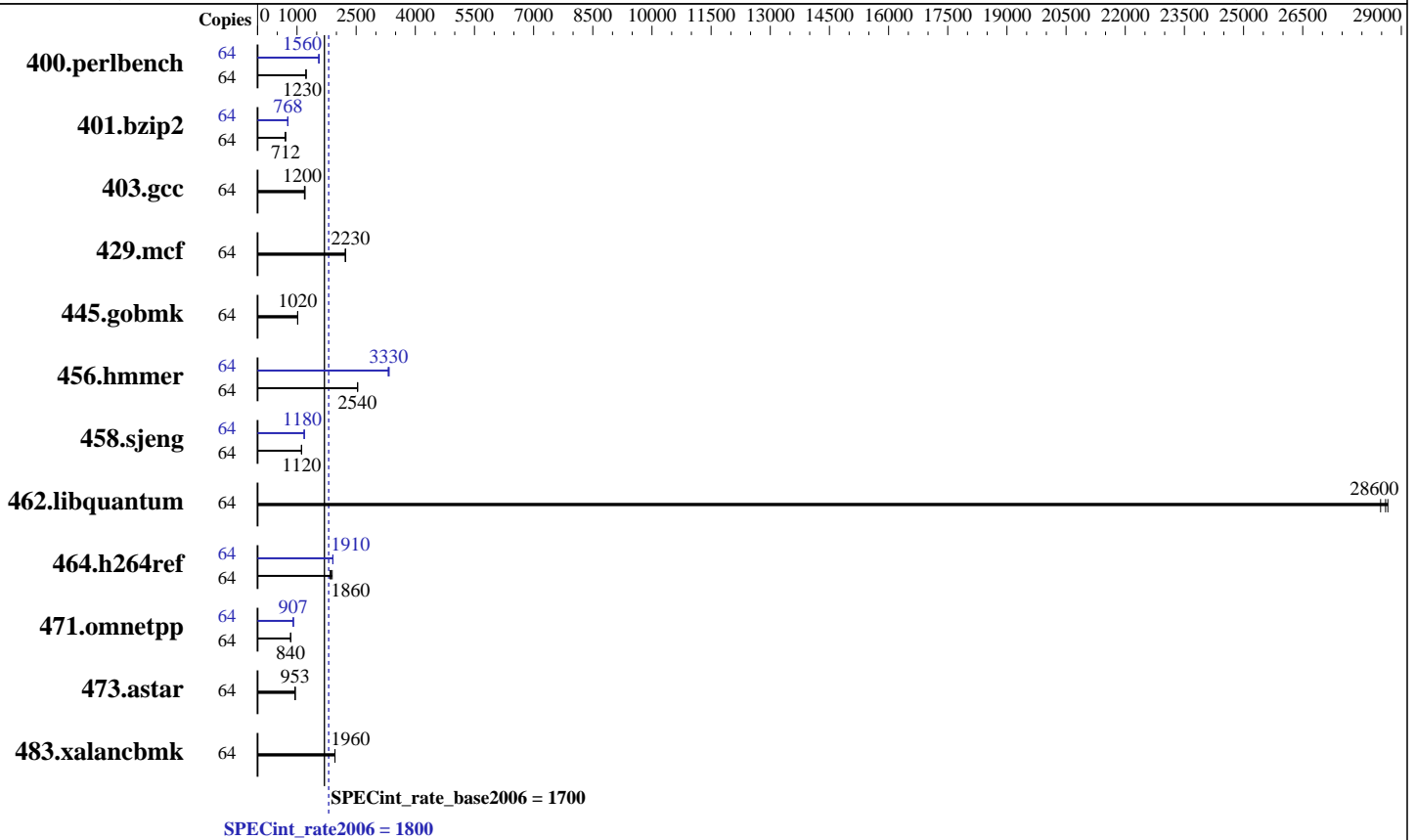**CPU2006 license:** 3175

Test sponsor: Huawei

Tested by: Huawei

Test date: Jun-2017

Hardware Availability: Aug-2017

Software Availability: Nov-2016

	Copies	
400.perlbench	64	1560
	64	1230
401.bzip2	64	768
	64	712
403.gcc	64	1200
429.mcf	64	2230
445.gobmk	64	1020
456.hmmer	64	3330
	64	2540
458.sjeng	64	1180
	64	1120
462.libquantum	64	28600
464.h264ref	64	1910
	64	1860
471.omnetpp	64	907
	64	840
473.astar	64	953
483.xalancbmk	64	1960

SPECint_rate_base2006 = 1700

SPECint_rate2006 = 1800

Hardware

CPU Name: Intel Xeon Gold 6142

CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz

CPU MHz: 2600

FPU: Integrated

CPU(s) enabled: 32 cores, 2 chips, 16 cores/chip, 2 threads/core

CPU(s) orderable: 1,2 chip

Primary Cache: 32 KB I + 32 KB D on chip per core

Secondary Cache: 1 MB I+D on chip per core

L3 Cache: 22 MB I+D on chip per chip

Other Cache: None

Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)

Disk Subsystem: 1 x 1200 GB SAS, 10000 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 17.0.1.132 of Intel C/C++ Compiler for Linux

Auto Parallel: No

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	64	508	1230	**509**	**1230**	509	1230	64	**402**	**1560**	403	1550	401	1560
401.bzip2	64	**867**	**712**	866	713	886	697	64	801	771	**805**	**768**	809	764
403.gcc	64	433	1190	429	1200	**429**	**1200**	64	433	1190	429	1200	**429**	**1200**
429.mcf	64	**262**	**2230**	261	2230	262	2230	64	**262**	**2230**	261	2230	262	2230
445.gobmk	64	659	1020	**660**	**1020**	660	1020	64	659	1020	**660**	**1020**	660	1020
456.hmmer	64	235	2540	236	2530	**236**	**2540**	64	**179**	**3330**	179	3330	180	3310
458.sjeng	64	**694**	**1120**	694	1120	695	1110	64	654	1180	**654**	**1180**	655	1180
462.libquantum	64	**46.4**	**28600**	46.3	28700	46.6	28500	64	**46.4**	**28600**	46.3	28700	46.6	28500
464.h264ref	64	769	1840	748	1890	**761**	**1860**	64	742	1910	**742**	**1910**	741	1910
471.omnetpp	64	**476**	**840**	476	841	476	840	64	441	907	**441**	**907**	442	906
473.astar	64	472	952	472	953	**472**	**953**	64	472	952	472	953	**472**	**953**
483.xalancbmk	64	225	1960	**225**	**1960**	225	1960	64	225	1960	**225**	**1960**	225	1960

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 configuration:
    Set Power Efficiency Mode to Performance
    Set SNC to Enable
    Set IMC Interleaving to 1 way
    Set Patrol Scrub to Disable
    Sysinfo program /spec17/config/sysinfo.rev6993
    Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
    running on localhost.localdomain Sat Jun 24 15:28:44 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 6142 CPU @ 2.60GHz
          2 "physical id"s (chips)
          64 "processors"

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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 : 16
       siblings  : 32
       physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
       physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    cache size : 22528 KB

From /proc/meminfo
    MemTotal:       790481628 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 localhost.localdomain 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 Jun 24 05:22

SPEC is set to: /spec17
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda2       xfs   898G   17G  882G   2% /
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 INSYDE Corp. 0.13 04/11/2017
  Memory:
  24x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666 MHz

(End of data from sysinfo program)
```

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General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/spec17/lib/ia32:/spec17/lib/intel64:/spec17/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:
 echo 1>        /proc/sys/vm/drop_caches
 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_2017/linux/lib/ia32
```

C++ benchmarks:
```
icpc -m32 -L/opt/intel/compilers_and_libraries_2017/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
```

Base Optimization Flags

C benchmarks:
```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap
```

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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_2017/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_2017/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

Peak Optimization Flags

C benchmarks:

> 400.perlbench: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(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

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Peak Optimization Flags (Continued)

401.bzip2: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(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: `basepeak = yes`

429.mcf: `basepeak = yes`

445.gobmk: `basepeak = yes`

456.hmmer: `-xCORE-AVX512 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`
`-qopt-mem-layout-trans=3`

458.sjeng: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(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) -xCORE-AVX512(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) -xCORE-AVX512(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/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.html
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-SKL-V1.6.html

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You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-SKL-V1.6.xml

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