SPEC® CINT2006 Result

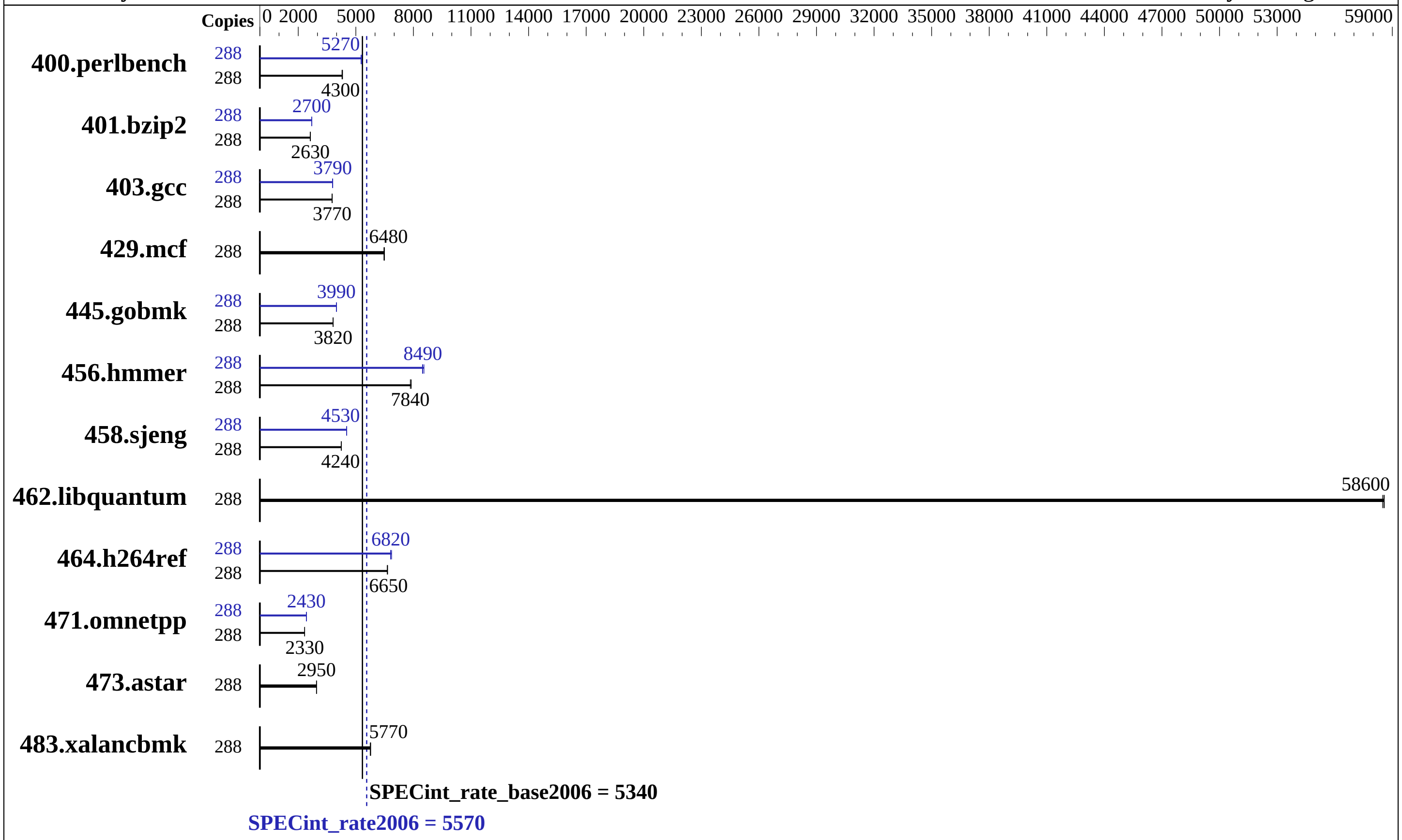
Hewlett Packard Enterprise
(Test Sponsor: HPE)

Integrity Superdome X
(144 core, 2.50 GHz, Intel Xeon E7-8890 v3)

SPECint®_rate2006 = 5570

SPECint_rate_base2006 = 5340

CPU2006 license: 3		**Test date:**	Oct-2015
Test sponsor:	HPE	**Hardware Availability:**	Oct-2015
Tested by:	HPE	**Software Availability:**	Aug-2015



Hardware

CPU Name:	Intel Xeon E7-8890 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz:	2500
FPU:	Integrated
CPU(s) enabled:	144 cores, 8 chips, 18 cores/chip, 2 threads/core
CPU(s) orderable:	2 to 16 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	45 MB I+D on chip per chip
Other Cache:	None
Memory:	2 TB (128 x 16 GB 2Rx4 PC4-2133P-L, running at 1600 MHz)
Disk Subsystem:	8 x C8S59A, 900 GB 10 K RPM SAS
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 11 (x86_64) SP3 Kernel 3.0.101-0.47.55-bigsmp
Compiler:	C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux
Auto Parallel:	No
File System:	tmpfs
System State:	Run level 3 (multi-user)
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2 Updated libgcc_s1, glibc, and libstdc++6

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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	288	**654**	**4300**	653	4310	658	4280	288	534	5270	**533**	**5270**	530	5310
401.bzip2	288	1055	2630	**1055**	**2630**	1060	2620	288	**1029**	**2700**	1029	2700	1028	2700
403.gcc	288	617	3760	614	3770	**615**	**3770**	288	613	3780	610	3800	**612**	**3790**
429.mcf	288	406	6460	**406**	**6480**	404	6490	288	406	6460	**406**	**6480**	404	6490
445.gobmk	288	791	3820	**792**	**3820**	792	3820	288	**757**	**3990**	757	3990	757	3990
456.hmmer	288	**343**	**7840**	341	7890	343	7840	288	**316**	**8490**	314	8550	317	8470
458.sjeng	288	822	4240	**822**	**4240**	822	4240	288	770	4530	770	4520	**770**	**4530**
462.libquantum	288	102	58500	**102**	**58600**	102	58600	288	102	58500	**102**	**58600**	102	58600
464.h264ref	288	957	6660	960	6640	**958**	**6650**	288	936	6810	**935**	**6820**	928	6870
471.omnetpp	288	771	2330	770	2340	**771**	**2330**	288	**742**	**2430**	742	2430	742	2430
473.astar	288	685	2950	**685**	**2950**	686	2950	288	685	2950	**685**	**2950**	686	2950
483.xalancbmk	288	346	5750	**345**	**5770**	344	5780	288	346	5750	**345**	**5770**	344	5780

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"
intel_idle.max_cstate=1 appended in kernel command line
Power profile set with:
 cpupower -c all frequency-set -g performance
Benchmark installed under /dev/shm/cpu2006 and mounted with:
   mount -o bind /dev/shm/cpu2006 /cpu2006
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>
To run the Intel binaries based off the Intel 16.0 compiler (with SLES11 SP3), the following software was updated:
 libgcc_s1 (32 and 64-bit versions) to version 4.8.3+r212056-6.3
 glibc (32 and 64-bit versions) to version 2.19-17.72
 libstdc++6 (32 and 64-bit versions) to version 4.8.3+r212056-6.3
```

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Platform Notes

```
Firmware settings:
 Memory RAS Configuration set to Maximum Performance
Sysinfo program /cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on hawk050os1 Mon Oct 26 11:10:33 2015

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) CPU E7-8890 v3 @ 2.50GHz
      8 "physical id"s (chips)
      288 "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 : 18
      siblings  : 36
      physical 0: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 1: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 2: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 3: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 4: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 5: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 6: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 7: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
   cache size : 46080 KB

From /proc/meminfo
   MemTotal:       2117695720 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 11 (x86_64)
      VERSION = 11
      PATCHLEVEL = 3

uname -a:
   Linux hawk050os1 3.0.101-0.47.55-bigsmp #1 SMP Thu May 28 08:25:11 UTC 2015
   (dc083ee) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 26 10:56 last=S

SPEC is set to: /cpu2006
   Filesystem     Type   Size  Used Avail Use% Mounted on
   tmpfs          tmpfs 1010G  3.8G 1007G   1% /dev/shm
```

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Platform Notes (Continued)

```
  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 HP Bundle: 007.005.000 SFW: 033.161.000 07/18/2015
    Memory:
     103x HP 36ASF2G72LZ-2G1A1 16 GB 2133 MHz, configured at 1600 MHz
     12x HP HMA42GL7MFR4N-TF 16 GB 2133 MHz, configured at 1600 MHz
     13x HP M386A2G40DB0-CPB 16 GB 2133 MHz, configured at 1600 MHz
     64x not defined not defined

  (End of data from sysinfo program)
 Regarding the sysinfo display about the memory installed, the correct amount of
 memory is 2 TB and the dmidecode description should have three lines reading as:
  103x HP 36ASF2G72LZ-2G1A1 16 GB 2133 MHz, configured at 1600 MHz
  12x HP HMA42GL7MFR4N-TF 16 GB 2133 MHz, configured at 1600 MHz
  13x HP M386A2G40DB0-CPB 16 GB 2133 MHz, configured at 1600 MHz
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64:/cpu2006/sh"

  Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
  memory using RedHat EL 7.1
```

Base Compiler Invocation

C benchmarks:
icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

C++ benchmarks:
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

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

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Base Portability Flags (Continued)

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-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -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_2016/linux/compiler/lib/ia32_lin

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_2016/linux/compiler/lib/ia32_lin

Peak Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64

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Peak Portability Flags (Continued)

401.bzip2: -D_FILE_OFFSET_BITS=64 -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: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
458.sjeng: -D_FILE_OFFSET_BITS=64 -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: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch -auto-ilp32 -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

429.mcf: basepeak = yes

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias -opt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4 -auto-ilp32

462.libquantum: basepeak = yes

464.h264ref: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2 -ansi-alias

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Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs -L/sh -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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revA.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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