SPEC® CINT2006 Result

Hewlett Packard Enterprise

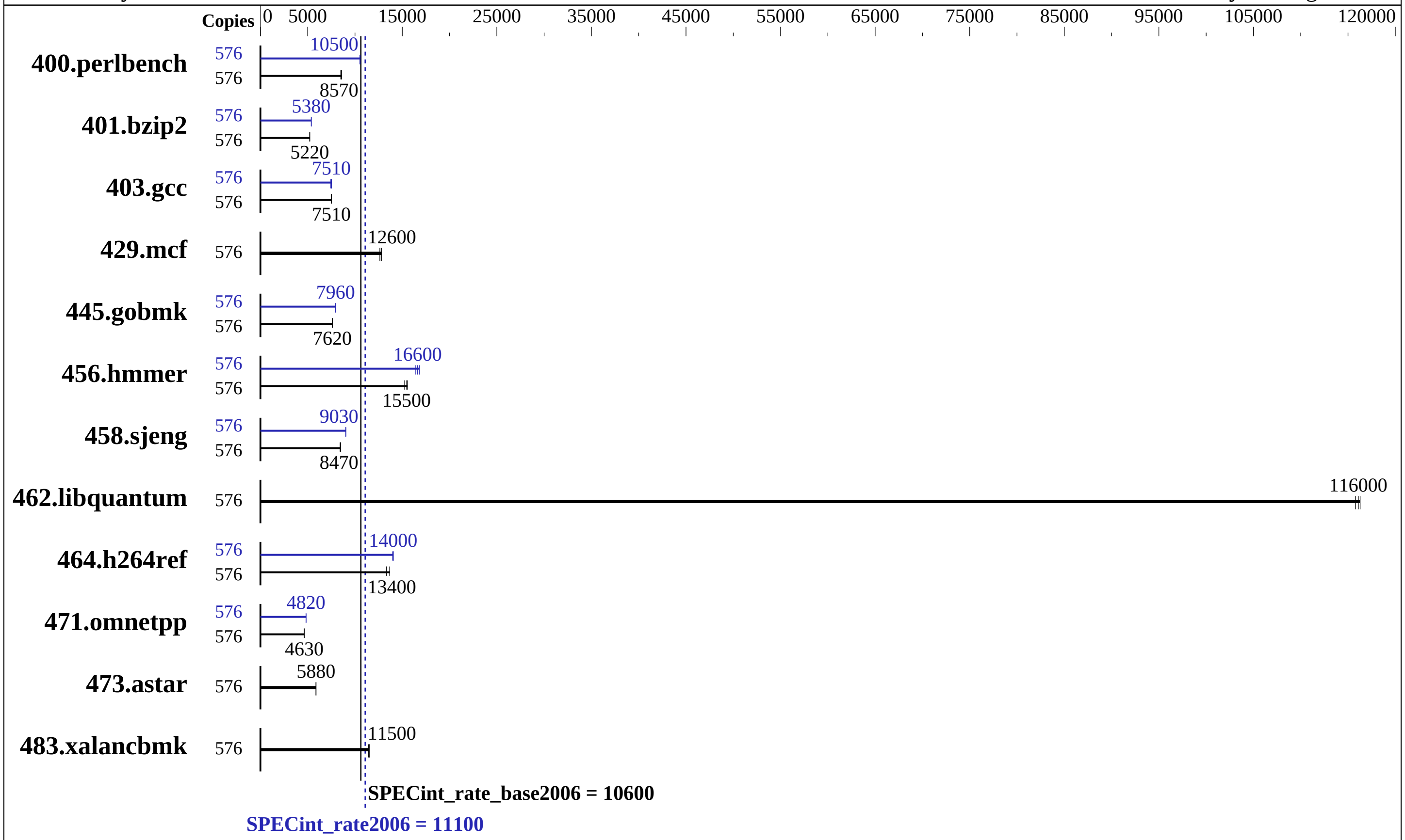
(Test Sponsor: HPE)

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

SPECint®_rate2006 = 11100

SPECint_rate_base2006 = 10600

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:	288 cores, 16 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:	4 TB (256 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	576	656	8580	662	8500	**657**	**8570**	576	**535**	**10500**	533	10600	535	10500
401.bzip2	576	1064	5220	1067	5210	**1065**	**5220**	576	1035	5370	1033	5380	**1033**	**5380**
403.gcc	576	**618**	**7510**	618	7500	617	7520	576	**617**	**7510**	617	7510	623	7440
429.mcf	576	416	12600	**415**	**12600**	410	12800	576	416	12600	**415**	**12600**	410	12800
445.gobmk	576	793	7620	**793**	**7620**	792	7630	576	**759**	**7960**	759	7960	759	7970
456.hmmer	576	346	15500	352	15300	**347**	**15500**	576	328	16400	320	16800	**323**	**16600**
458.sjeng	576	822	8480	827	8420	**823**	**8470**	576	**772**	**9030**	772	9030	773	9010
462.libquantum	576	103	116000	**103**	**116000**	103	116000	576	103	116000	**103**	**116000**	103	116000
464.h264ref	576	933	13700	955	13300	**954**	**13400**	576	**908**	**14000**	907	14100	913	14000
471.omnetpp	576	778	4630	777	4640	**778**	**4630**	576	748	4810	**747**	**4820**	747	4820
473.astar	576	688	5880	**687**	**5880**	687	5880	576	688	5880	**687**	**5880**	687	5880
483.xalancbmk	576	348	11400	345	11500	**346**	**11500**	576	348	11400	345	11500	**346**	**11500**

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
```

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 Tue Oct 20 09:29:23 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
      16 "physical id"s (chips)
      576 "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
      physical 8: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 9: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 10: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 11: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 12: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 13: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 14: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 15: 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:       4235779104 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:
```

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Platform Notes (Continued)

```
      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 20 08:13 last=S

   SPEC is set to: /cpu2006
      Filesystem     Type   Size  Used Avail Use% Mounted on
      tmpfs          tmpfs  2.0T  3.8G  2.0T   1% /dev/shm
   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:
      222x HP 36ASF2G72LZ-2G1A1 16 GB 2133 MHz, configured at 1600 MHz
      18x HP HMA42GL7MFR4N-TF 16 GB 2133 MHz, configured at 1600 MHz
      16x HP M386A2G40DB0-CPB 16 GB 2133 MHz, configured at 1600 MHz
      128x not defined not defined

   (End of data from sysinfo program)
  Regarding the sysinfo display about the memory installed, the correct amount of
  memory is 4 TB and the dmidecode description should have three lines reading as:
   222x HP 36ASF2G72LZ-2G1A1 16 GB 2133 MHz, configured at 1600 MHz
   18x HP HMA42GL7MFR4N-TF 16 GB 2133 MHz, configured at 1600 MHz
   16x 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
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
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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