## SPECint® CINT2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
Integrity Superdome X  
(288 core, 2.50 GHz, Intel Xeon E7-8890 v3)  

**SPECint**\_rate\_2006 = 11100  
SPECint\_rate\_base\_2006 = 10600

### Hardware

| Test date: | Oct-2015 |
| Test sponsor: | HPE |
| Software Availability: | Aug-2015 |
| Hardware Availability: | Oct-2015 |

| CPU2006 license: | 3 |
| Tested by: | HPE |

### Software

| Operating System: | SUSE Linux Enterprise Server 11 (x86_64) SP3 |
| Compiler: | C/C++: Version 16.0.0.1.01 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 |

### Test Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECint_rate_2006</th>
<th>SPECint_rate_base_2006</th>
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<tr>
<td>400.perlbench</td>
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<td>401.bzip2</td>
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### Details

**Copies**

- **400.perlbench:** 576
- **401.bzip2:** 576
- **403.gcc:** 576
- **429.mcf:** 576
- **445.gobmk:** 576
- **451.hmmer:** 576
- **458.sjeng:** 576
- **462.libquantum:** 576
- **464.h264ref:** 576
- **471.omnetpp:** 576
- **473.astar:** 576
- **483.xalancbmk:** 576

**Software**

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- 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

**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
SPEC CINT2006 Result

Hewlett Packard Enterprise
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CPU2006 license: 3
Test sponsor: HPE
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SPECint_rate2006 = 11100
SPECint_rate_base2006 = 10600

Results Table

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<tr>
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</tbody>
</table>

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++ (32 and 64-bit versions) to version 4.8.3+r212056-6.3
Hewlett Packard Enterprise
(Integrity Superdome X)

SPECint_rate2006 = 11100
SPECint_rate_base2006 = 10600

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

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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# SPEC CINT2006 Result

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<table>
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<tr>
<th>SPECint_rate2006</th>
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<td>SPECint_rate_base2006</td>
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**CPU2006 license:** 3  
**Test date:** Oct-2015  
**Test sponsor:** HPE  
**Hardware Availability:** Oct-2015  
**Tested by:** HPE  
**Software Availability:** Aug-2015  

## Platform Notes (Continued)

Linux hawk050os1 3.0.101-0.47.55-big SMP #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`
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Test sponsor: HPE
Tested by: HPE

Test date: Oct-2015
Hardware Availability: Oct-2015
Software Availability: Aug-2015

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
**SPEC CINT2006 Result**

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*(Test Sponsor: HPE)*

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**Tested by:** HPE  
**Test date:** Oct-2015  
**Hardware Availability:** Oct-2015  
**Software Availability:** Aug-2015

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### 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`

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### 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) -ipopp-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) -auto-ilp32 -ansi-alias -opt-prefetch`
- **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) -ipopp-use(pass 2) -opt-mem-layout-trans=3`
- **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) -ipopp-use(pass 2) -unroll12 -ansi-alias -opt-mem-layout-trans=3`

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Continued on next page
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

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For other inquiries, please contact webmaster@spec.org.

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