## SPECint® CINT2006 Result

### Huawei RH5885H V3 (Intel Xeon E7-8870 v3)

<table>
<thead>
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**CPU2006 license:** 3175  
**Test sponsor:** Huawei  
**Tested by:** Huawei  
**Test date:** May-2015  
**Hardware Availability:** May-2015  
**Software Availability:** Sep-2014

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<tr>
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<tr>
<td>400.perlbench</td>
<td>144</td>
<td>2460</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>144</td>
<td>1970</td>
</tr>
<tr>
<td>403.gcc</td>
<td>144</td>
<td>1300</td>
</tr>
<tr>
<td>409.mcf</td>
<td>144</td>
<td>1880</td>
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<td>429.gobmk</td>
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<td>3170</td>
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<td>456.hmmer</td>
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<td>458.sjeng</td>
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<td>3800</td>
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<td>462.libquantum</td>
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<td>2550</td>
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<tr>
<td>464.h264ref</td>
<td>144</td>
<td>3240</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>144</td>
<td>3130</td>
</tr>
<tr>
<td>473.astar</td>
<td>144</td>
<td>1190</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>144</td>
<td>2680</td>
</tr>
</tbody>
</table>

### Hardware

| CPU Name: | Intel Xeon E7-8870 v3 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.90 GHz |
| CPU MHz: | 2100 |
| FPU: | Integrated |
| CPU(s) enabled: | 72 cores, 4 chips, 18 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2,4 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: | 1 TB (64 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz) |
| Disk Subsystem: | 3 x 300 GB SAS, 10K RPM |
| Other Hardware: | None |

### Software

| Operating System: | Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64 |
| Compiler: | C/C++: Version 15.0.0.090 of Intel C++ Studio XE 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 V10.0 |
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### Results Table

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<tr>
<th>Benchmark</th>
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<th>Seconds Base</th>
<th>Seconds Ratio</th>
<th>Seconds Peak</th>
<th>Seconds Ratio</th>
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<tbody>
<tr>
<td>perlbench</td>
<td>144</td>
<td>714</td>
<td>1970</td>
<td>144</td>
<td>577</td>
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<tr>
<td>bzip2</td>
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<td>1109</td>
<td>1250</td>
<td>144</td>
<td>1072</td>
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<td>gcc</td>
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<td>620</td>
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<td>578</td>
</tr>
<tr>
<td>mcf</td>
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<td>832</td>
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<td>834</td>
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<tr>
<td>gobmk</td>
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<td>903</td>
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<tr>
<td>hmmmer</td>
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<td>354</td>
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<tr>
<td>sjeng</td>
<td>144</td>
<td>1026</td>
<td>1026</td>
<td>144</td>
<td>1026</td>
</tr>
<tr>
<td>libquantum</td>
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<td>759</td>
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<tr>
<td>h264ref</td>
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<td>730</td>
<td>726</td>
<td>144</td>
<td>727</td>
</tr>
<tr>
<td>omnetpp</td>
<td>144</td>
<td>372</td>
<td>371</td>
<td>144</td>
<td>371</td>
</tr>
</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"
Turbo mode set with:
cpupower -c all frequency-set -g performance

### Platform Notes

**BIOS configuration:**
- Set Power Efficiency Mode to Performance
- Set Lock_step to disabled
- Baseboard Management Controller used to adjust the fan speed to 100%
- Set DRAM Maintainence to Manual
- Set DRAM Maintainence Mode to pTRR
- Set Patrol Scrub to Enabled
- Set Memory Power Saving to disabled

Sysinfo program /spec/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e8219e1
running on rh5885hv3 Thu May 28 07:14:00 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
Continued on next page
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**Platform Notes (Continued)**

From /proc/cpuinfo

```
  model name : Intel(R) Xeon(R) CPU E7-8870 v3 @ 2.10GHz
  4 "physical id"s (chips)
  144 "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 4 8 9 10 11 16 17 18 19 20 24 25 26 27
    physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
    physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
    physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  cache size : 46080 KB
```

From /proc/meminfo

```
  MemTotal:       1056462228 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB
```

From /etc/*release*/
```
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.0 (Maipo)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="7.0"
  PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
  ANSI_COLOR="0;31"
  CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
  redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

  uname -a:
  Linux rh5885hv3 3.10.0-123.e17.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014
  x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 May 28 07:05
```

SPEC is set to: /spec
```
  Filesystem     Type  Size  Used  Avail Use% Mounted on
  /dev/mapper/rhel-root xfs   342G  19G  324G   6% /
```

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 American Megatrends Inc. BLISV705 03/30/2015
  Continued on next page
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Platform Notes (Continued)

Memory:
32x NO DIMM NO DIMM
64x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of memory is 1 TB and the dmidecode description should have two lines reading as:
32x NO DIMM NO DIMM
64x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz

General Notes

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

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0
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/composer_xe_2015/lib/ia32

C++ benchmarks:
icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

Base Portability Flags

400.perlbench: -DSPEC_CPU_LINUX_IA32
462.libquantum: -DSPEC_CPU_LINUX
483.xalancbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3

Continued on next page
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### Base Optimization Flags (Continued)

- 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/composer_xe_2015/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/composer_xe_2015/lib/ia32

### Peak Portability Flags

- 400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
- 401.bzip2: -DSPEC_CPU_LP64
- 456.hmmer: -DSPEC_CPU_LP64
- 458.sjeng: -DSPEC_CPU_LP64
- 462.libquantum: -DSPEC_CPU_LINUX
- 483.xalancbmk: -DSPEC_CPU_LINUX

### Peak Optimization Flags

- C benchmarks:
  - 400.perlbench: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
  -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
  -auto-ilp32

Continued on next page
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Peak Optimization Flags (Continued)

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-prefetch -auto-ilp32 -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -03 -no-prec-div

429.mcf: basepeak = yes

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

456.hmmer: -xCORE-AVX2 -ipo -03 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll4 -auto-ilp32

462.libquantum: basepeak = yes

464.h264ref: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll12 -ansi-alias

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs
-L/sh -lmartheap

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-ic15.0-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-V1.0-HSW-RevG.xml
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