# SPEC® CINT2006 Result

**Sugon**

**Sugon I620-G20 (Intel Xeon E5-2640 v3)**

<table>
<thead>
<tr>
<th>SPECint_rate2006 = 716</th>
<th>SPECint_rate_base2006 = 693</th>
</tr>
</thead>
</table>

**CPU2006 license:** 9046  
**Test date:** Nov-2014  
**Hardware Availability:** Sep-2014  
**Test sponsor:** Sugon  
**Software Availability:** Nov-2013  
**Tested by:** Sugon

## Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon E5-2640 v3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU MHZ:</td>
<td>2600</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>16 cores, 2 chips, 8 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chip</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>20 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 2.0 TB SATA 7200 RPM</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>Red Hat Enterprise Linux Server release 6.5 (Santiago)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>File System:</td>
<td>ext4</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>32-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software:</td>
<td>Microquill SmartHeap V10.0</td>
</tr>
</tbody>
</table>
**Sugon**

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**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>32</td>
<td>594</td>
<td>526</td>
<td>598</td>
<td>523</td>
<td>594</td>
<td>526</td>
<td>32</td>
<td>487</td>
<td>642</td>
<td>487</td>
<td>642</td>
<td>487</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>32</td>
<td>917</td>
<td>337</td>
<td>918</td>
<td>336</td>
<td>916</td>
<td>337</td>
<td>32</td>
<td>878</td>
<td>352</td>
<td>880</td>
<td>351</td>
<td>878</td>
</tr>
<tr>
<td>403.gcc</td>
<td>32</td>
<td>494</td>
<td>521</td>
<td>495</td>
<td>520</td>
<td>493</td>
<td>522</td>
<td>32</td>
<td>494</td>
<td>521</td>
<td>495</td>
<td>520</td>
<td>493</td>
</tr>
<tr>
<td>429.mcf</td>
<td>32</td>
<td>312</td>
<td>936</td>
<td>311</td>
<td>939</td>
<td>310</td>
<td>941</td>
<td>32</td>
<td>312</td>
<td>936</td>
<td>311</td>
<td>939</td>
<td>310</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>32</td>
<td>727</td>
<td>461</td>
<td>728</td>
<td>461</td>
<td>727</td>
<td>461</td>
<td>32</td>
<td>709</td>
<td>474</td>
<td>708</td>
<td>474</td>
<td>710</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>32</td>
<td>293</td>
<td>1020</td>
<td>311</td>
<td>939</td>
<td>310</td>
<td>941</td>
<td>32</td>
<td>293</td>
<td>1020</td>
<td>311</td>
<td>939</td>
<td>310</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>32</td>
<td>793</td>
<td>489</td>
<td>790</td>
<td>490</td>
<td>790</td>
<td>490</td>
<td>32</td>
<td>764</td>
<td>507</td>
<td>763</td>
<td>507</td>
<td>766</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>32</td>
<td>93.7</td>
<td>7080</td>
<td>94.0</td>
<td>7060</td>
<td>93.9</td>
<td>7060</td>
<td>32</td>
<td>93.7</td>
<td>7080</td>
<td>94.0</td>
<td>7060</td>
<td>93.9</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>32</td>
<td>878</td>
<td>807</td>
<td>886</td>
<td>800</td>
<td>883</td>
<td>802</td>
<td>32</td>
<td>861</td>
<td>822</td>
<td>836</td>
<td>847</td>
<td>855</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>32</td>
<td>539</td>
<td>371</td>
<td>538</td>
<td>372</td>
<td>538</td>
<td>372</td>
<td>32</td>
<td>509</td>
<td>393</td>
<td>507</td>
<td>394</td>
<td>507</td>
</tr>
<tr>
<td>473.astar</td>
<td>32</td>
<td>584</td>
<td>385</td>
<td>587</td>
<td>383</td>
<td>589</td>
<td>382</td>
<td>32</td>
<td>584</td>
<td>385</td>
<td>587</td>
<td>383</td>
<td>589</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>32</td>
<td>288</td>
<td>766</td>
<td>289</td>
<td>764</td>
<td>287</td>
<td>769</td>
<td>32</td>
<td>288</td>
<td>766</td>
<td>289</td>
<td>764</td>
<td>287</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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**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**

Enforce POR set to Enable
Memory Frequency set to Auto
Early Snoop set to disabled
COD set to enable
Power Technology set to performance
Sysinfo program `/home/cpu2006/config/sysinfo.rev6874`
$Rev: 6874 $ $Date:: 2013-11-20 #$ 654bd3fc53b06faef0e2e54ed011998
running on localhost Sun Nov 9 07:15:18 2014

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 E5-2640 v3 @ 2.60GHz
 2 "physical id"s (chips)
 32 "processors"
```

Continued on next page
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| SPECint_rate2006 | 716 |
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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 : 8
- Siblings : 16
- Physical 0: cores 0 1 2 3 4 5 6 7
- Physical 1: cores 0 1 2 3 4 5 6 7
- Cache size : 20480 KB

From /proc/meminfo

- MemTotal: 264479460 KB
- HugePages_Total: 0
- Hugepagesize: 2048 KB

/usr/bin/lsb_release -d

- Red Hat Enterprise Linux Server release 6.5 (Santiago)

From /etc/*release* /etc/*version*

- redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
- system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)

uname -a:

- Linux localhost 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013
- x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 7 10:38

SPEC is set to: /home/cpu2006

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda3</td>
<td>ext4</td>
<td>1.8T</td>
<td>753G</td>
<td>970G</td>
<td>44%</td>
<td>/</td>
</tr>
</tbody>
</table>

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. 068 08/15/2014

Memory:

- 16x Hynix Semiconductor HMA42GR7MFR4N-TFTD 16 GB 2 rank 2133 MHz, configured at 1866 MHz
- 8x NO DIMM NO DIMM

(End of data from sysinfo program)

---

**General Notes**

Environment variables set by runspec before the start of the run:

LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

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General Notes (Continued)

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RedHat EL 6.4
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1 > /proc/sys/vm/drop_caches
runcpec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Submitted by: Tian Yuwan <tianyw@sugon.com>
Submitted: Wed Nov 12 00:56:20 EST 2014
Submission: cpu2006-20141112-32778.sub

Submitted by: Tian Yuwan <tianyw@sugon.com>
Submitted: Sun Nov 23 21:50:03 EST 2014
Submission: cpu2006-20141112-32778.sub

Submitted by: Tian Yuwan <tianyw@sugon.com>
Submitted: Wed Nov 26 05:11:52 EST 2014
Submission: cpu2006-20141112-32778.sub

Submitted by: Tian Yuwan <tianyw@sugon.com>
Submitted: Thu Nov 27 00:57:34 EST 2014
Submission: cpu2006-20141112-32778.sub

Base Compiler Invocation

C benchmarks:
  icc  -m32

C++ benchmarks:
  icpc -m32

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

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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
400.perlbench: icc -m64
401.bzip2: icc -m64
456.hmmer: icc -m64
458.sjeng: icc -m64

C++ benchmarks:
icpc -m32

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

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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: basepeak = yes
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 -O3 -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 -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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Sugon-Platform-Settings-V1.2-HSW-revA.20141203.xml
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<thead>
<tr>
<th>SPEC CINT2006 Result</th>
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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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