SPEC® CINT2006 Result

Huawei

Huawei CH226 V3 (Intel Xeon E5-2699 v4)

<table>
<thead>
<tr>
<th>SPECint®2006</th>
<th>SPECint_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>= NC</td>
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</tbody>
</table>

CPU2006 license: 3175
Test date: Jan-2016
Test sponsor: Huawei
Hardware Availability: Mar-2016
Tested by: Huawei
Software Availability: Mar-2016

SPEC has determined that this result is not in compliance with the SPEC CPU2006 run and reporting rules. Specifically, the memory was not available as required by SPEC CPU rule 1.3.2 and the SPEC Open Systems Group policy on general availability.

| 400.perlbench |
| 401.bzip2   |
| 403.gcc     |
| 429.mcf     |
| 445.gobmk   |
| 456.hmmer   |
| 458.sjeng   |
| 462.libquantum |
| 464.h264ref |
| 471.omnetpp |
| 473.astar   |
| 483.xalancbmk |

Hardware
- CPU Name: Intel Xeon E5-2699 v4
- CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
- CPU MHz: 2200
- FPU: Integrated
- CPU(s) enabled: 44 cores, 2 chips, 22 cores/chip
- CPU(s) orderable: 1,2 chip
- Primary Cache: 32 KB L1 + 32 KB D on chip per core
- Secondary Cache: 256 KB L1+D on chip per core
- L3 Cache: 55 MB L1+D on chip per chip
- Other Cache: None
- Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
- Disk Subsystem: 1 x 100 GB SATA, 7200 RPM
- Other Hardware: None

Software
- Operating System: Red Hat Enterprise Linux Server release 7.2 (Maipo)
- Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux
- Auto Parallel: Yes
- File System: xfs
- System State: Run level 3 (multi-user)
- Base Pointers: 32/64-bit
- Peak Pointers: 32/64-bit
- Other Software: Microquill SmartHeap V10.2

Non-Compliant
SPEC CINT2006 Result

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Results Table

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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 config file option "submit" was used.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

<table>
<thead>
<tr>
<th>BIOS Configuration:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Power Efficiency Mode to Custom</td>
</tr>
<tr>
<td>Set Snoop Mode to ES mode</td>
</tr>
<tr>
<td>Set Patrol Scrub to Disable</td>
</tr>
<tr>
<td>Set Hyper-Threading to Disable</td>
</tr>
<tr>
<td>Sysinfo program /spec16/config/sysinfo.rev6914</td>
</tr>
<tr>
<td>$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1</td>
</tr>
</tbody>
</table>

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

Continued on next page
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SPEC CINT2006 Result

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Platform Notes (Continued)

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) CPU E5-2699 v4 @ 2.20GHz
2 "physical id"s (chips)
44 "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 : 22
siblings : 22
physical 0: cores 0 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 1: cores 0 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
cache size : 56320 KB
```

From /proc/meminfo

```
MemTotal: 263566508 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

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

```
NAME="Red Hat Enterprise Linux Server"
VERSION="7.2 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.2"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:ga:server"
redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
```

uname -a:
```
Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015 x86_64 x86_64 x86_64 GNU/Linux
```
run-level 3 Jun 2 13:38

SPEC is set to: /spec16

Filesystem Type Size Used Avail Use% Mounted on
Continued on next page
Huawei

Huawei CH226 V3 (Intel Xeon E5-2699 v4)

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**SPECint_base2006** = NC

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---

**Platform Notes (Continued)**

```plaintext
/dev/sda2    xfs    440G   13G  428G   3% /
```

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 Insyde Corp. 8.08 01/29/2016

Memory:
- 8x NO DIMM NO DIMM 3 rank
- 8x Samsung M393A2G40EB1 CR 16 GB 1 rank 2400 MHz
- 8x Samsung M393A2G40EB1 CR 16 GB 2 rank 2400 MHz

(End of data from sysinfo program)

---

**General Notes**

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

- `KMP_AFFINITY = "granularity=fine,compact,1,0"
- `LD_LIBRARY_PATH = "/spec16/libs/32:/spec16/libs/64:/spec16/sh"
- `OMP_NUM_THREADS = "4"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using Red Hat EL7.1

Transparent Huge Pages enabled with:
- `echo always > /sys/kernel/mm/transparent_hugepage/enabled`
- `runcpm command invoked through numactl i.e.: numactl --interleave=all runspec <etc>`

---

**Base Compiler Invocation**

C benchmarks:
- `icc  -m64`

C++ benchmarks:
- `icpc  -m64`
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**Base Portability Flags**

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</tr>
<tr>
<td>483.xalancbmk</td>
<td>-DSPEC_CPU_LP64  -DSPEC_CPU_LINUX</td>
</tr>
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</table>

**Base Optimization Flags**

- xCORE-AVX2
- -ipo
- -O3
- -no-prec-div
- -parallel
- -opt-prefetch
- -auto-p32

**C++ benchmarks**

- xCORE-AVX2
- -ipo
- -O3
- -no-prec-div
- -opt-prefetch
- -auto-p32
- -Wl,-z,muldefs
- -L/sh -lsmartheap64

**Base Other Flags**

- 403.gcc: -Dalloca=_alloca

**Peak Compiler Invocation**

**C benchmarks**

- icc -m64

- 400.perlbench: icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin


---

Non-compliant
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**Peak Compiler Invocation (Continued)**

C++ benchmarks (except as noted below):

```bash
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
473.astar: icpc -m64
```

**Peak Portability Flags**

```plaintext
400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: icpc -m64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

**Peak Optimization Flags**

C benchmarks:

```plaintext
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) -opt-prefetch
  -ansi-alias

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

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc
  -opt-malloc-options=3 -auto-ilp32

429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
  -opt-prefetch -auto-p32
```

Continued on next page
Huawei

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<th>Benchmark</th>
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<td>456.hmmer</td>
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<td>462.libquantum</td>
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<td>467.omnetpp</td>
<td>-xCORE-AVX2(pass 1) -prof-gen:threadsafepass 1 -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -opt-ra-region-strategy=block -ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap</td>
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<td>473.astar</td>
<td>--basepeak = yes</td>
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**Peak Optimization Flags (Continued)**

**Peak Other Flags**

- 403.gcc: -Dalloca=_alloca

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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/Huawei-Platform-Settings-BDW-V1.0.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/Huawei-Platform-Settings-BDW-V1.0.xml

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

Tested with SPEC CPU2006 v1.2.
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