Huawei
Kunlun 9016 (Intel Xeon E7-8860 v4)

SPECat@_rate2006 = Not Run
SPECat_rate_base2006 = 10900

CPU2006 license: 3175
Test sponsor: Huawei
Tested by: Huawei

Test date: Apr-2017
Hardware Availability: Jan-2016
Software Availability: Dec-2015

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECint_rate_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>576</td>
<td>8720</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>576</td>
<td>5330</td>
</tr>
<tr>
<td>403.gcc</td>
<td>576</td>
<td>6900</td>
</tr>
<tr>
<td>429.mcf</td>
<td>576</td>
<td>13400</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>576</td>
<td>7070</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>576</td>
<td>16700</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>576</td>
<td>8390</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>576</td>
<td>121000</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>576</td>
<td>14900</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>576</td>
<td>4800</td>
</tr>
<tr>
<td>473.astar</td>
<td>576</td>
<td>6320</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>576</td>
<td>12000</td>
</tr>
</tbody>
</table>

SPECat_rate_base2006 = 10900

Hardware

CPU Name: Intel Xeon E7-8860 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 288 cores, 16 chips, 18 cores/chip, 2 threads/core
CPU(s) orderable: 4,8,16 chip
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: 2 TB (128 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem: 2 x 600 GB SAS, 10K RPM
Other Hardware: None

Software

Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP1
Kernel 3.12.49-11-default
Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux
Auto Parallel: No
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.2
SPEC CINT2006 Result

Huawei
Kunlun 9016 (Intel Xeon E7-8860 v4)

SPECint_rate2006 = Not Run
SPECint_rate_base2006 = 10900

CPU2006 license: 3175
Test sponsor: Huawei
Test date: Apr-2017
Tested by: Huawei
Hardware Availability: Jan-2016
Software Availability: Dec-2015

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>Copies</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>576</td>
<td>647</td>
<td>8700</td>
<td>645</td>
<td>8730</td>
<td>645</td>
<td>8720</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>401.bzip2</td>
<td>576</td>
<td>1044</td>
<td>5330</td>
<td>1044</td>
<td>5320</td>
<td>1043</td>
<td>5330</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>403.gcc</td>
<td>576</td>
<td>672</td>
<td>6900</td>
<td>673</td>
<td>6880</td>
<td>662</td>
<td>7000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>429.mcf</td>
<td>576</td>
<td>391</td>
<td>13400</td>
<td>392</td>
<td>13400</td>
<td>391</td>
<td>13400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>445.gobmk</td>
<td>576</td>
<td>853</td>
<td>7090</td>
<td>867</td>
<td>6970</td>
<td>854</td>
<td>7070</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>456.hmmer</td>
<td>576</td>
<td>321</td>
<td>16700</td>
<td>321</td>
<td>16700</td>
<td>319</td>
<td>16800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>458.sjeng</td>
<td>576</td>
<td>830</td>
<td>8390</td>
<td>831</td>
<td>8380</td>
<td>831</td>
<td>8390</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>462.libquantum</td>
<td>576</td>
<td>98.8</td>
<td>121000</td>
<td>98.7</td>
<td>121000</td>
<td>98.8</td>
<td>121000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>464.h264ref</td>
<td>576</td>
<td>857</td>
<td>14900</td>
<td>856</td>
<td>14900</td>
<td>862</td>
<td>14800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>576</td>
<td>749</td>
<td>4800</td>
<td>749</td>
<td>4800</td>
<td>748</td>
<td>4810</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>473.astar</td>
<td>576</td>
<td>639</td>
<td>6330</td>
<td>640</td>
<td>6320</td>
<td>640</td>
<td>6320</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>576</td>
<td>331</td>
<td>12000</td>
<td>326</td>
<td>12200</td>
<td>333</td>
<td>12000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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
Baseboard Management Controller used to adjust the fan speed to 100%
Sysinfo program /spec/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-ew80 Fri Apr 7 04:39:22 2017

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 E7-8860 v4 @ 2.20GHz
16 "physical id"'s (chips)
576 "processors"
Huawei
Kunlun 9016 (Intel Xeon E7-8860 v4)

SPECint_rate2006 = Not Run
SPECint_rate_base2006 = 10900

CPU2006 license: 3175
Test sponsor: Huawei
Tested by: Huawei

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 : 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
- physical 4: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 5: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 6: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 7: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 8: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 9: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 10: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 11: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 12: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 13: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 14: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 15: 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:       2117103720 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP1

From /etc/*release* /etc/*version*
SuSE-release:
  SuSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 1
  # This file is deprecated and will be removed in a future service pack or
  # release.
  # Please check /etc/os-release for details about this release.
  os-release:
    NAME="SLES"
    VERSION="12-SP1"
    VERSION_ID="12.1"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
  (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

Continued on next page
Huawei

Kunlun 9016 (Intel Xeon E7-8860 v4)

SPECint_rate2006 = Not Run
SPECint_rate_base2006 = 10900

CPU2006 license: 3175
Test sponsor: Huawei
Tested by: Huawei

Test date: Apr-2017
Hardware Availability: Jan-2016
Software Availability: Dec-2015

Platform Notes (Continued)

run-level 5 Apr 7 04:14
SPEC is set to: /spec
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda3      ext4  1.1T  227G  829G  22% /
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. 5.11 02/21/2017
   Memory:
      128x Micron 36ASF2G72PZ-2G1A2 16 GB 2 rank 2133 MHz, configured at 1600 MHz
      256x 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 = "/spec/libs/32:/spec/libs/64:/spec/sh"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
memory using RedHat EL 7.1
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
runcpec command invoked through numactl i.e.:
   numactl --interleave=all runcpec <etc>

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

Continued on next page
Huawei
Kunlun 9016 (Intel Xeon E7-8860 v4)

CPU2006 license: 3175
Test sponsor: Huawei
Tested by: Huawei

SPECint_rate2006 = Not Run
SPECint_rate_base2006 = 10900

Base Portability Flags (Continued)

```plaintext
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

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

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-V1.2-BDW-RevG.20170404.xml

SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Originally published on 3 October 2017.