Huawei RH1288 V3 (Intel Xeon E5-2650L v4)

SPECint_rate2006 = 1010
SPECint_rate_base2006 = 954

CPU2006 license: 3175
Test date: Nov-2016
Test sponsor: Huawei
Hardware Availability: Mar-2016
Tested by: Huawei
Software Availability: Dec-2015

Operating System: SUSE Linux Enterprise Server 12 SP1 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 3 (multi-user)
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.2

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
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<tbody>
<tr>
<td>Operating System: SUSE Linux Enterprise Server 12 SP1 3.12.49-11-default</td>
<td>CPU Name: Intel Xeon E5-2650L v4</td>
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<tr>
<td>Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux</td>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz</td>
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<tr>
<td>Auto Parallel: No</td>
<td>CPU MHz: 1700</td>
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<tr>
<td>File System: ext4</td>
<td>FPU: Integrated</td>
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<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>CPU(s) enabled: 28 cores, 2 chips, 14 cores/chip, 2 threads/core</td>
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<tr>
<td>Base Pointers: 32-bit</td>
<td>CPU(s) orderable: 1,2 chip</td>
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<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
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<tr>
<td>Other Software: Microquill SmartHeap V10.2</td>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

CPU Name: Intel Xeon E5-2650L v4
CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz
CPU MHz: 1700
FPU: Integrated
CPU(s) enabled: 28 cores, 2 chips, 14 cores/chip, 2 threads/core
CPU(s) orderable: 1,2 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: 35 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (8 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 600 GB SAS, 10000 RPM
Other Hardware: None
Huawei
Huawei RH1288 V3 (Intel Xeon E5-2650L v4)

SPECint_rate2006 = 1010
SPECint_rate_base2006 = 954

CPU2006 license: 3175
Test sponsor: Huawei
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Results Table

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</table>

Peak

|        |        |         |       |         |       |         |       |         |       |         |       |
| Base   |        |         |       |         |       |         |       |         |       |         |       |
|        |        |         |       |         |       |         |       |         |       |         |       |
| 400.perlbench | 56 | 656     | 834   | 658     | 832   | 656     | 834   |         |       |         |       |
| 401.bzip2  | 56     | 1101    | 491   | 1103    | 490   | 1105    | 489   |         |       |         |       |
| 403.gcc    | 56     | 597     | 755   | 601     | 750   | 602     | 748   |         |       |         |       |
| 429.mcf    | 56     | 359     | 1420  | 360     | 1420  | 359     | 1420  |         |       |         |       |
| 445.gobmk  | 56     | 982     | 598   | 985     | 596   | 984     | 597   |         |       |         |       |
| 456.hmmer  | 56     | 327     | 1600  | 328     | 1590  | 329     | 1590  |         |       |         |       |
| 458.sjeng  | 56     | 1023    | 663   | 1022    | 663   | 1022    | 663   |         |       |         |       |
| 462.libquantum | 56 | 125     | 9250  | 125     | 9250  | 125     | 9250  |         |       |         |       |
| 464.h264ref | 56 | 1243    | 997   | 1213    | 1020  | 1215    | 1020  |         |       |         |       |
| 471.omnetpp | 56     | 570     | 614   | 571     | 613   | 571     | 613   |         |       |         |       |
| 473.astar  | 56     | 689     | 571   | 687     | 572   | 687     | 572   |         |       |         |       |
| 483.xalancbmk | 56 | 325     | 1190  | 326     | 1190  | 327     | 1180  |         |       |         |       |

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"

Platform Notes

BIOS configuration:
Set Power Efficiency Mode to Performance
Set Snoop Mode to COD mode
Set Patrol Scrub to Disable
Sysinfo program /spec16/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1
running on linux-suse Thu Nov 17 18:28:32 2016

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 E5-2650L v4@ 1.70GHz
2 "physical id"s (chips)
56 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
Continued on next page
Huawei

Huawei RH1288 V3 (Intel Xeon E5-2650L v4)

**SPECint_rate2006 = 1010**

**SPECint_rate_base2006 = 954**

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

<table>
<thead>
<tr>
<th>Test date</th>
<th>Hardware Availability</th>
<th>Software Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov-2016</td>
<td>Mar-2016</td>
<td>Dec-2015</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

following excerpts from `/proc/cpuinfo` might not be reliable. Use with caution.

- `cpu cores`: 14
- `siblings`: 28
- `physical 0`: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
- `physical 1`: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
- `cache size`: 17920 KB

From `/proc/meminfo`
```
MemTotal:       264268020 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

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
```

run-level 3 Nov 17 04:00

**SPEC is set to:** /spec16

**Filesystem**  **Type**  **Size**  **Used**  **Avail**  **Use%**  **Mounted on**
/dev/sda1  ext4  551G  55G  495G  10% /

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 Insysde Corp. 3.31 08/22/2016

Memory:
- 8x Micron 36ASF4G72PZ-2G3B1 32 GB 2 rank 2400 MHz
- 8x NO DIMM NO DIMM

(End of data from sysinfo program)
Huawei RH1288 V3 (Intel Xeon E5-2650L v4)

SPEC CINT2006 Result

Huawei

SPECint_rate2006 = 1010
SPECint_rate_base2006 = 954

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

Test date: Nov-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/spec16/libs/32:/spec16/libs/64:/spec16/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
runspec command invoked through numactl i.e.:
umactl --interleave=all runspec <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
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
Huawei RH1288 V3 (Intel Xeon E5-2650L v4)

**SPECint_rate2006 = 1010**

**SPECint_rate_base2006 = 954**

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

Test date: Nov-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

---

**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`

---

**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_LP64`
- `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`

---

**Peak Optimization Flags**

C benchmarks:

- `400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilkp32`

Continued on next page
## Huawei RH1288 V3 (Intel Xeon E5-2650L v4)

| SPECint_rate2006 | 1010 |
| SPECint_rate_base2006 | 954 |

### Peak Optimization Flags (Continued)

- **401.bzip2**: -xCORE-AVX2 -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
  -auto-ilp32 -ansi-alias

- **403.gcc**: -xCORE-AVX2 -ipo -O3 -no-prec-div

- **429.mcf**: basepeak = yes

- **445.gobmk**: -xCORE-AVX2 -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 -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) -unroll4
  -auto-ilp32

- **462.libquantum**: basepeak = yes

- **464.h264ref**: -xCORE-AVX2 -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) -unroll2
  -ansi-alias

### Peak Other Flags

#### C++ benchmarks:

- **471.omnetpp**: -xCORE-AVX2 -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

#### C benchmarks:

- **403.gcc**: -Dalloca=_alloca
Huawei RH1288 V3 (Intel Xeon E5-2650L v4)

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CPU2006 license: 3175
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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.
Originally published on 13 December 2016.