Huawei RH2288 V3 (Intel Xeon E5-2609 v3)

**SPECint_rate2006 = 318**

**SPECint_rate_base2006 = 308**

**CPU2006 license:** 3175  
**Test date:** Dec-2014  
**Hardware Availability:** Sep-2014

**Test sponsor:** Huawei  
**Tested by:** Huawei  
**Software Availability:** Jun-2014

**CPU Name:** Intel Xeon E5-2609 v3  
**Operating System:** Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64

**CPU Characteristics:**  
**Compiler:** C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux

**CPU MHz:** 1900  
**Auto Parallel:** No

**FPU:** Integrated  
**File System:** ext4

**CPU(s) enabled:** 12 cores, 2 chips, 6 cores/chip  
**System State:** Run level 3 (multi-user)

**CPU(s) orderable:** 1,2 chip  
**Base Pointers:** 32-bit

**Primary Cache:** 32 KB I + 32 KB D on chip per core  
**Peak Pointers:** 32/64-bit

**Secondary Cache:** 256 KB I+D on chip per core  
**Other Software:** Microquill SmartHeap V10.0

**L3 Cache:** 15 MB I+D on chip per chip

**Other Cache:** None

**Memory:** 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
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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>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>12</td>
<td>492</td>
<td>238</td>
<td>493</td>
<td>238</td>
<td>494</td>
<td>238</td>
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<tr>
<td>401.bzip2</td>
<td>12</td>
<td><strong>842</strong></td>
<td><strong>138</strong></td>
<td>842</td>
<td>137</td>
<td>840</td>
<td>136</td>
</tr>
<tr>
<td>403.gcc</td>
<td>12</td>
<td><strong>414</strong></td>
<td><strong>233</strong></td>
<td>415</td>
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<tr>
<td>429.mcf</td>
<td>12</td>
<td><strong>250</strong></td>
<td><strong>437</strong></td>
<td>251</td>
<td>436</td>
<td>249</td>
<td>440</td>
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<tr>
<td>445.gobmk</td>
<td>12</td>
<td><strong>691</strong></td>
<td><strong>182</strong></td>
<td>690</td>
<td>182</td>
<td>691</td>
<td>182</td>
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<tr>
<td>456.hmmer</td>
<td>12</td>
<td><strong>267</strong></td>
<td><strong>419</strong></td>
<td>266</td>
<td>421</td>
<td>268</td>
<td>418</td>
</tr>
<tr>
<td>458.sjeng</td>
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<td><strong>214</strong></td>
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<td>462.libquantum</td>
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<td>3410</td>
<td>73.2</td>
<td>3400</td>
<td>73.3</td>
<td>3390</td>
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<td>464.h264ref</td>
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<td><strong>389</strong></td>
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<td>471.omnetpp</td>
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<td>463</td>
<td>162</td>
<td>465</td>
<td><strong>161</strong></td>
</tr>
<tr>
<td>473.astar</td>
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<td><strong>171</strong></td>
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<td>491</td>
<td>171</td>
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<tr>
<td>483.xalancbmk</td>
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<td>370</td>
<td><strong>225</strong></td>
<td><strong>368</strong></td>
<td>225</td>
<td>368</td>
</tr>
</tbody>
</table>

**Results 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"

## Platform Notes

**BIOS configuration:**
- Set Power Efficiency Mode to Custom
- Set Snoop Mode to ES
- Set Patrol Scrub to Disable

Baseboard Management Controller used to adjust the fan speed to 100%

Sysinfo program /spec15/config/sysinfo.rev6914

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Thu Dec 25 08:57:47 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 E5-2609 v3 @ 1.90GHz
- 2 "physical id"s (chips)
- 12 "processors"

Continued on next page
Huawei

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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
cautions.)

cpu cores : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5
physical 1: cores 0 1 2 3 4 5
cache size : 15360 KB

From /proc/meminfo
MemTotal: 263721952 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-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 localhost.localdomain 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57
EDT 2014 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 24 17:36

SPEC is set to: /spec15

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-root ext4 241G 113G 116G 50% /

Additional information from dmeminfo:

Warning: Use caution when you interpret this section. The 'dmeminfo' 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. 1.18 09/17/2014
Memory:
8x Samsung M393A2G40DB0-CPB 16 GB 1 rank 2133 MHz, configured at 1600 MHz
8x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz

(End of data from sysinfo program)
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**General Notes**

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/spec15/libs/32:/spec15/libs/64:/spec15/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

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
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Peak Compiler Invocation

C benchmarks (except as noted below):

```bash
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:

```bash
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:

```bash
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
```

401.bzip2: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -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(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) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto-ilp32`

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Huawei RH2288 V3 (Intel Xeon E5-2609 v3)

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

Peak Optimization Flags (Continued)

462.libquantum: basepeak = yes

464.h264ref: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -ansi-alias

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(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
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-HASWELL-V1.2.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-HASWELL-V1.2.xml

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

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