Dell Inc.

PowerEdge R630 (Intel Xeon E5-2609 v4, 1.70 GHz)

<table>
<thead>
<tr>
<th>SPECint®2006 = 37.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_base2006 = 35.7</td>
</tr>
</tbody>
</table>

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

**Hardware**

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon E5-2609 v4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU MHZ:</td>
<td>1700</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>16 cores, 2 chips, 8 cores/chip</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 PC4-2400T-R, running at 1866 MHz)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 500 GB 7200 RPM SATA</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 7.2 (Maipo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software:</td>
<td>Microquill SmartHeap V10.2</td>
</tr>
</tbody>
</table>

---

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
SPEC CINT2006 Result

Dell Inc.

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<table>
<thead>
<tr>
<th>Benchmark</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>476</td>
<td>20.8</td>
<td>476</td>
<td>20.5</td>
<td>477</td>
<td>20.5</td>
<td>442</td>
<td>22.1</td>
<td>442</td>
<td>22.1</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>742</td>
<td>13.0</td>
<td>739</td>
<td>13.1</td>
<td>738</td>
<td>13.1</td>
<td>728</td>
<td>13.3</td>
<td>729</td>
<td>13.2</td>
</tr>
<tr>
<td>429.mcf</td>
<td>223</td>
<td>40.9</td>
<td>224</td>
<td>40.7</td>
<td>227</td>
<td>40.1</td>
<td>223</td>
<td>41.0</td>
<td>223</td>
<td>41.0</td>
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<tr>
<td>445.gobmk</td>
<td>718</td>
<td>14.6</td>
<td>718</td>
<td>14.6</td>
<td>718</td>
<td>14.6</td>
<td>712</td>
<td>14.7</td>
<td>712</td>
<td>14.7</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>222</td>
<td>42.0</td>
<td>222</td>
<td>42.1</td>
<td>221</td>
<td>42.1</td>
<td>222</td>
<td>42.0</td>
<td>222</td>
<td>42.1</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>692</td>
<td>17.5</td>
<td>692</td>
<td>17.5</td>
<td>692</td>
<td>17.5</td>
<td>684</td>
<td>17.7</td>
<td>684</td>
<td>17.7</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>607</td>
<td>3410</td>
<td>6.16</td>
<td>3360</td>
<td>5.99</td>
<td>3460</td>
<td>6.07</td>
<td>3410</td>
<td>6.16</td>
<td>3360</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>729</td>
<td>30.4</td>
<td>730</td>
<td>30.3</td>
<td>728</td>
<td>30.4</td>
<td>729</td>
<td>30.4</td>
<td>730</td>
<td>30.3</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>292</td>
<td>21.4</td>
<td>294</td>
<td>21.2</td>
<td>299</td>
<td>20.9</td>
<td>224</td>
<td>27.9</td>
<td>224</td>
<td>27.9</td>
</tr>
<tr>
<td>473.astar</td>
<td>371</td>
<td>18.9</td>
<td>371</td>
<td>18.9</td>
<td>372</td>
<td>18.9</td>
<td>371</td>
<td>18.9</td>
<td>371</td>
<td>18.9</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>169</td>
<td>40.9</td>
<td>169</td>
<td>40.9</td>
<td>169</td>
<td>40.9</td>
<td>159</td>
<td>43.5</td>
<td>159</td>
<td>43.4</td>
</tr>
</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

BIOS settings:
Snoop Mode set to Opportunistic Snoop Broadcast
Virtualization Technology disabled
System Profile set to Custom
CPU Power Management set to Maximum Performance
Energy Efficient Turbo disabled
Memory Patrol Scrub disabled
Cstates autonomous/C1E enabled
Energy Efficient Policy set to Performance
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Tue Mar  8 03:21:17 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 E5-2609 v4@ 1.70GHz
Continued on next page
Dell Inc.

PowerEdge R630 (Intel Xeon E5-2609 v4, 1.70 GHz)

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**CPU2006 license:** 55
**Test date:** Mar-2016
**Hardware Availability:** Mar-2016

**Test sponsor:** Dell Inc.
**Software Availability:** Mar-2016
**Tested by:** Dell Inc.

**Platform Notes (Continued)**

2 "physical id"s (chips)  
16 "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 : 8  
- siblings : 8  
- 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:  264040556 kB  
- HugePages_Total: 0  
- Hugepagesize:  2048 kB

From /etc/*release*/etc/*version*
- os-release:
  - 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  
Mar 8 03:19

SPEC is set to: /root/cpu2006-1.2

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 256G 10G 247G 4% /

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 SMIOS" standard.

BIOS Dell Inc. 2.0.1 02/12/2016
Memory:
16x 002C0632002C 18ASF2G72PD2-2G3B1 16 GB 2 rank 2400 MHz, configured at 1866 MHz  
8x Not Specified Not Specified

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SPEC CINT2006 Result

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**Platform Notes (Continued)**

(End of data from sysinfo program)

**General Notes**

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

- KMP_AFFINITY = "granularity=fine,scatter"
- LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
- OMP_NUM_THREADS = "16"

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

**Base Compiler Invocation**

C benchmarks:
- icc  -m64

C++ benchmarks:
- icpc -m64

**Base Portability Flags**

- 400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
- 401.bzip2: -DSPEC_CPU_LP64
- 403.gcc: -DSPEC_CPU_LP64
- 429.mcf: -DSPEC_CPU_LP64
- 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: -DSPEC_CPU_LP64
- 473.astar: -DSPEC_CPU_LP64
- 483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

**Base Optimization Flags**

C benchmarks:
- -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
## SPEC CINT2006 Result

**Dell Inc.**

PowerEdge R630 (Intel Xeon E5-2609 v4, 1.70 GHz)

| SPECint2006 = | 37.0 |
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### CPU2006 license: 55

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| Tested by: | Dell Inc. |

| Test date: | Mar-2016 |
| Hardware Availability: | Mar-2016 |
| Software Availability: | Mar-2016 |

### Base Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

### Peak Compiler Invocation

C benchmarks (except as noted below):

```sh
icc -m64
```

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

445.gobmk: `icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

C++ benchmarks (except as noted below):

```sh
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

473.astar: `icpc -m64`

### Peak Portability Flags

```sh
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: -DSPEC_CPU_LP64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

### Peak Optimization Flags

C benchmarks:

```sh
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
```

```sh
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
```

Continued on next page
SPEC CINT2006 Result

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Peak Optimization Flags (Continued)

401.bzip2 (continued):
  -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

445.gobmk:
  -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
  -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias

456.hmmer:
  basepeak = yes

458.jbig2dec:
  -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) -unroll

462.libquantum:
  basepeak = yes

464.h264ref:
  basepeak = yes

C++ benchmarks:

471.omnetpp:
  -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-ra-region-strategy=block -ansi-alias
  -Wl,-z,muldefs -L/sh -lsmartheap

473.astar:
  basepeak = yes

483.xalancbmk:
  -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
  -ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap

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-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/Dell-Platform-Settings-V1.2-revD.20151006.xml
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