Dell Inc.
PowerEdge R730 (Intel Xeon CPU E5-2640 v4, 2.40 GHz)

SPECint®2006 = 68.7
SPECint_base2006 = 64.8

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

Test date: Feb-2017
Hardware Availability: Mar-2016
Software Availability: Nov-2016

400.perlbench 154.5
401.bzip2 119.7
403.gcc 117.0
429.mcf 113.7
445.gobmk 68.9
456.hmmer 39.9
458.sjeng 33.4
462.libquantum 25.6
464.h264ref 25.2
471.omnetpp 30.3
473.astar 34.1
483.xalancbmk 33.6

SPECint2006 = 68.7
SPECint_base2006 = 64.8

Hardware
CPU Name: Intel Xeon E5-2640 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz
CPU MHz: 2400
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip
CPU(s) orderable: 1.2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 25 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx8 PC4-2400T-R, running at 2133 MHz)
Disk Subsystem: 2 x 2000 GB SAS 7200 RPM RAID0
Other Hardware: None

Software
Operating System: SUSE Linux Enterprise Server 12 3.12.28-4-default
Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux
Auto Parallel: Yes
File System: ext4
System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.2
Dell Inc.  

PowerEdge R730 (Intel Xeon CPU E5-2640 v4, 2.40 GHz)  

SPECint2006 = 68.7  
SPECint_base2006 = 64.8

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

Results Table

<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>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>247</td>
<td>39.5</td>
<td>248</td>
<td>39.5</td>
<td>248</td>
<td>39.4</td>
<td>216</td>
<td>45.3</td>
<td>215</td>
<td>45.4</td>
<td>215</td>
<td>45.4</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>383</td>
<td>25.2</td>
<td>383</td>
<td>25.2</td>
<td>385</td>
<td>25.0</td>
<td>377</td>
<td>25.6</td>
<td>377</td>
<td>25.6</td>
<td>377</td>
<td>25.6</td>
</tr>
<tr>
<td>403.gcc</td>
<td>216</td>
<td>37.3</td>
<td>216</td>
<td>37.3</td>
<td>216</td>
<td>37.3</td>
<td>217</td>
<td>37.2</td>
<td>218</td>
<td>36.9</td>
<td>217</td>
<td>37.0</td>
</tr>
<tr>
<td>429.mcf</td>
<td>351</td>
<td>68.9</td>
<td>351</td>
<td>68.9</td>
<td>351</td>
<td>68.9</td>
<td>351</td>
<td>68.9</td>
<td>351</td>
<td>68.9</td>
<td>351</td>
<td>68.9</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>132</td>
<td>33.4</td>
<td>132</td>
<td>60.9</td>
<td>130</td>
<td>70.1</td>
<td>131</td>
<td>69.8</td>
<td>131</td>
<td>69.7</td>
<td>131</td>
<td>69.5</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>362</td>
<td>33.4</td>
<td>362</td>
<td>33.4</td>
<td>362</td>
<td>33.5</td>
<td>354</td>
<td>34.1</td>
<td>355</td>
<td>34.3</td>
<td>354</td>
<td>34.1</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>3.96</td>
<td>5230</td>
<td>3.95</td>
<td>5250</td>
<td>3.96</td>
<td>5230</td>
<td>3.96</td>
<td>5230</td>
<td>3.95</td>
<td>5250</td>
<td>3.96</td>
<td>5230</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>387</td>
<td>57.1</td>
<td>388</td>
<td>57.0</td>
<td>386</td>
<td>57.3</td>
<td>387</td>
<td>57.1</td>
<td>388</td>
<td>57.0</td>
<td>386</td>
<td>57.3</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>193</td>
<td>32.1</td>
<td>178</td>
<td>35.1</td>
<td>186</td>
<td>33.5</td>
<td>125</td>
<td>49.9</td>
<td>125</td>
<td>49.8</td>
<td>125</td>
<td>50.0</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>202</td>
<td>34.8</td>
<td>202</td>
<td>34.8</td>
<td>201</td>
<td>34.9</td>
<td>201</td>
<td>35.0</td>
<td>202</td>
<td>34.8</td>
<td>202</td>
<td>34.8</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>93.4</td>
<td>73.9</td>
<td>95.2</td>
<td>72.5</td>
<td>94.3</td>
<td>73.2</td>
<td>84.4</td>
<td>81.8</td>
<td>84.8</td>
<td>81.4</td>
<td>84.4</td>
<td>81.8</td>
</tr>
</tbody>
</table>

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 Performance set to Maximum Performance
C States set to Autonomous
C1E disabled
Energy Efficient Turbo disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
Logical Processor disabled
Sysinfo program /root/previous-cpu2006-1.2/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
runtime on linux-0171 Thu Feb 2 16:39:27 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

Continued on next page
Dell Inc.
PowerEdge R730 (Intel Xeon CPU E5-2640 v4, 2.40 GHz)

SPECint2006 = 68.7
SPECint_base2006 = 64.8

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

Test date: Feb-2017
Hardware Availability: Mar-2016
Software Availability: Nov-2016

Platform Notes (Continued)

From /proc/cpuinfo
- model name : Intel(R) Xeon(R) CPU E5-2640 v4 @ 2.40GHz
- 2 "physical id"s (chips)
- 20 "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 : 10
  - siblings : 10
  - physical 0: cores 0 1 2 3 4 8 9 10 11 12
  - physical 1: cores 0 1 2 3 4 8 9 10 11 12
- cache size : 25600 KB

From /proc/meminfo
- MemTotal: 264567484 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

From /etc/*release* /etc/*version*
- SuSE-release:
  - SUSE Linux Enterprise Server 12 (x86_64)
  - VERSION = 12
  - PATCHLEVEL = 0
  - # 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"
  - VERSION_ID="12"
  - PRETTY_NAME="SUSE Linux Enterprise Server 12"
  - ID="sles"
  - ANSI_COLOR="0;32"
  - CPE_NAME="cpe:/o:suse:sles:12"

uname -a:
- Linux linux-0171 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
  (9879bd4) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Feb 2 15:06

SPEC is set to: /root/previous-cpu2006-1.2

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
Dell Inc.
PowerEdge R730 (Intel Xeon CPU E5-2640 v4, 2.40 GHz)

SPECint2006 = 68.7
SPECint_base2006 = 64.8

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

Test date: Feb-2017
Hardware Availability: Mar-2016
Software Availability: Nov-2016

Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMI BIOS" standard.

BIOS Dell Inc. 2.3.4 11/08/2016
Memory:
7x 00AD063200AD HMA82GR7MF8N-UH 16 GB 2 rank 2400 MHz, configured at 2133 MHz
9x 00CE00B300CE M393A2K43BB1-CRC 16 GB 2 rank 2400 MHz, configured at 2133 MHz
8x Not Specified Not Specified

(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/previous-cpu2006-1.2/libs/32:/root/previous-cpu2006-1.2/libs/64:/root/previous-cpu2006-1.2/sh10.2"
OMP_NUM_THREADS = "20"
The Dell PowerEdge R730 and the PowerEdge R730xd models are electronically equivalent.
The results have been measured on a Dell PowerEdge R730xd model.
Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2
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
445.gobmk: -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

Continued on next page
Dell Inc.  
PowerEdge R730 (Intel Xeon CPU E5-2640 v4, 2.40 GHz)  

SPECint2006 = 68.7  
SPECint_base2006 = 64.8  

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

Test date: Feb-2017  
Hardware Availability: Mar-2016  
Software Availability: Nov-2016  

Base Portability Flags (Continued)  
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, -qopt-prefetch, -auto-p32  
C++ benchmarks:  
-xCORE-AVX2, -ipo, -O3, -no-prec-div, -qopt-prefetch, -auto-p32, -Wl,-z,muldefs, -L/sh10.2, -lsmartheap64  

Base Other Flags  
C benchmarks:  
403.gcc: -Dalloca=_alloca  

Peak Compiler Invocation  
C benchmarks (except as noted below):  
icc -m64  
400.perlbench: icc -m32, -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32  
445.gobmk: icc -m32, -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32  
C++ benchmarks (except as noted below):  
icc -m32, -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32  
473.astar: icpc -m64  

Peak Portability Flags  
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  

Continued on next page
Dell Inc.

PowerEdge R730 (Intel Xeon CPU E5-2640 v4, 2.40 GHz)

SPECint2006 = 68.7
SPECint_base2006 = 64.8

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

Test date: Feb-2017
Hardware Availability: Mar-2016
Software Availability: Nov-2016

Peak Portability Flags (Continued)

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:

400.perlbench: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -qopt-prefetch

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

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

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

445.gobmk: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2)

456.hmmer: basepeak = yes

458.sjeng: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unRoll4

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -qopt-ra-region-strategy=block
-Wl,-z,muldefs -L/sh10.2 -lsmartheap

473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-auto-p32 -Wl,-z,muldefs -L/sh10.2 -lsmartheap64

Continued on next page
# SPEC CINT2006 Result

## Dell Inc.
PowerEdge R730 (Intel Xeon CPU E5-2640 v4, 2.40 GHz)

<table>
<thead>
<tr>
<th>SPECint2006</th>
<th>68.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_base2006</td>
<td>64.8</td>
</tr>
</tbody>
</table>

### Test Information
- **CPU2006 license:** 55
- **Test sponsor:** Dell Inc.
- **Tested by:** Dell Inc.
- **Test date:** Feb-2017
- **Hardware Availability:** Mar-2016
- **Software Availability:** Nov-2016

### Peak Optimization Flags (Continued)

```
483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
           -Wl,-z,muldefs -L/sh10.2 -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-ic17.0-official-linux64.html](http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html)

You can also download the XML flags sources by saving the following links:

- [http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml](http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.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 2 March 2017.