**Dell Inc.**

PowerEdge R730 (Intel Xeon E5-2699A v4, 2.40 GHz)  

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECint_rate2006</th>
<th>SPECint_rate_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench</td>
<td>1880</td>
<td>1820</td>
</tr>
<tr>
<td>bzip2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gcc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mcf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gobmk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hammer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sjeng</td>
<td></td>
<td></td>
</tr>
<tr>
<td>libquantum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h264ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>omnetpp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>astar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xalancbmk</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test date:** May-2017  
**Hardware Availability:** Oct-2016  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Software Availability:** Sep-2016

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon E5-2699A v4</td>
<td>Operating System: SUSE Linux Enterprise Server 12 SP1 3.12.48-1-default</td>
</tr>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz</td>
<td>Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux</td>
</tr>
<tr>
<td>CPU MHZ: 2400</td>
<td>Auto Parallel: No</td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>CPU(s) enabled: 44 cores, 2 chips, 22 cores/chip, 2 threads/core</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>CPU(s) orderable: 1,2 chip</td>
<td>Base Pointers: 32-bit</td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
<td>Other Software: Microquill SmartHeap V10.2</td>
</tr>
<tr>
<td>L3 Cache: 55 MB I+D on chip per chip</td>
<td></td>
</tr>
<tr>
<td>Other Cache: None</td>
<td></td>
</tr>
<tr>
<td>Memory: 256 GB (16 x 16 GB 2Rx8 PC4-2400T-R)</td>
<td></td>
</tr>
<tr>
<td>Disk Subsystem: 200 GB SATA SSD</td>
<td></td>
</tr>
<tr>
<td>Other Hardware: None</td>
<td></td>
</tr>
</tbody>
</table>
**SPEC CINT2006 Result**

**Dell Inc.**
PowerEdge R730 (Intel Xeon E5-2699A v4, 2.40 GHz)

**SPECint_rate2006 = 1880**

**SPECint_rate_base2006 = 1820**

CPU2006 license: 55
Test sponsor: Dell Inc.
Test date: May-2017
Hardware Availability: Oct-2016
Tested by: Dell Inc.
Software Availability: Sep-2016

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds Base</th>
<th>Seconds Ratio</th>
<th>Seconds Peak</th>
<th>Seconds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>88</td>
<td>551</td>
<td>1560</td>
<td>552</td>
<td>1560</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>88</td>
<td>890</td>
<td>954</td>
<td>888</td>
<td>956</td>
</tr>
<tr>
<td>403.gcc</td>
<td>88</td>
<td>544</td>
<td>1300</td>
<td>544</td>
<td>1300</td>
</tr>
<tr>
<td>429.mcf</td>
<td>88</td>
<td>376</td>
<td>2130</td>
<td>377</td>
<td>2130</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>88</td>
<td>691</td>
<td>1340</td>
<td>692</td>
<td>1330</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>88</td>
<td>335</td>
<td>2450</td>
<td>337</td>
<td>2440</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>88</td>
<td>728</td>
<td>1460</td>
<td>727</td>
<td>1460</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>88</td>
<td>90.2</td>
<td>20200</td>
<td>90.1</td>
<td>20200</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>88</td>
<td>827</td>
<td>2360</td>
<td>814</td>
<td>2390</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>88</td>
<td>809</td>
<td>809</td>
<td>809</td>
<td>809</td>
</tr>
<tr>
<td>473.astar</td>
<td>88</td>
<td>632</td>
<td>978</td>
<td>631</td>
<td>979</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>88</td>
<td>354</td>
<td>1720</td>
<td>355</td>
<td>1710</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"

**Platform Notes**

- BIOS settings:
  - Snoop Mode set to Cluster on Die
  - Virtualization Technology disabled
  - System Profile set to Custom
  - CPU Performance set to Maximum Performance
  - C States set to Autonomous
  - C1E disabled
  - Energy Efficient Turbo enabled
  - Uncore Frequency set to Dynamic
  - Energy Efficiency Policy set to Balanced Performance
  - Memory Patrol Scrub disabled

Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux Fri May 12 09:07:24 2017

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

Continued on next page
SPEC CINT2006 Result

Dell Inc.
PowerEdge R730 (Intel Xeon E5-2699A v4, 2.40 GHz)

SPECint_rate2006 = 1880
SPECint_rate_base2006 = 1820

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

Test date: May-2017
Hardware Availability: Oct-2016
Software Availability: Sep-2016

Platform Notes (Continued)

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
  model name : Intel(R) Xeon(R) CPU E5-2699A v4 @ 2.40GHz
  2 "physical id"s (chips)
  88 "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 : 22
  siblings : 44
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
  cache size : 28160 KB

From /proc/meminfo
  MemTotal:       264567592 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:
    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:
  Linux linux 3.12.48-1-default #1 SMP Fri Sep 18 13:49:47 UTC 2015 (a83966d)
    x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 3 17:37

SPEC is set to: /root/cpu2006-1.2
  Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 182G 15G 168G 8% /
Additional information from dmidecode:
Continued on next page
Dell Inc.

PowerEdge R730 (Intel Xeon E5-2699A v4, 2.40 GHz)

SPECint_rate2006 = 1880
SPECint_rate_base2006 = 1820

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

Test date: May-2017
Hardware Availability: Oct-2016
Software Availability: Sep-2016

Platform Notes (Continued)

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 Dell Inc. 2.3.4 11/08/2016
Memory:
7x 00AD063200AD HMA82GR7MF8SN-UH 16 GB 2 rank 2400 MHz
9x 00CE00B300CE M393A2K43BB1-CRC 16 GB 2 rank 2400 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:
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh10.2"
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 i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.2
Transparent Huge Pages enabled by default
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/compilers_and_libraries_2017/linux/lib/ia32

C++ benchmarks:
  icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

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

Continued on next page
Dell Inc.

PowerEdge R730 (Intel Xeon E5-2699A v4, 2.40 GHz)

**SPEC CINT2006 Result**

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>1880</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>1820</td>
</tr>
</tbody>
</table>

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

**Test date:** May-2017
**Hardware Availability:** Oct-2016
**Software Availability:** Sep-2016

---

**Base Portability Flags (Continued)**

- 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` `-qopt-prefetch`
- `-qopt-mem-layout-trans=3`

**C++ benchmarks:**
- `-xCORE-AVX2` `-ipo` `-O3` `-no-prec-div` `-qopt-prefetch`
- `-qopt-mem-layout-trans=3` `-Wl,-z,muldefs -L/sh10.2 -lsmarthep`

---

**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_2017/linux/lib/ia32`
- 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_2017/linux/lib/ia32`

---

**Peak Portability Flags**

- 400.perlbench: `-DSPEC\_CPU\_LP64` `-DSPEC\_CPU\_LINUX\_X64`
- 401.bzip2: `-DSPEC\_CPU\_LP64`

---

Continued on next page
Dell Inc.
PowerEdge R730 (Intel Xeon E5-2699A v4, 2.40 GHz)

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

Peak Portability Flags (Continued)

403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
464.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
467.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
473.astar: -D_FILE_OFFSET_BITS=64

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) -auto-ilp32 -qopt-mem-layout-trans=3

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(pass 2) -qopt-prefetch -auto-ilp32
-qopt-mem-layout-trans=3

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3

429.mcf: basepeak = yes

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) -qopt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
-qopt-mem-layout-trans=3

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 -auto-ilp32
-qopt-mem-layout-trans=3

462.libquantum: basepeak = yes

464.h264ref: -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) -unroll2 -qopt-mem-layout-trans=3

Continued on next page
Dell Inc.

PowerEdge R730 (Intel Xeon E5-2699A v4, 2.40 GHz)

SPECint_rate2006 = 1880
SPECint_rate_base2006 = 1820

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

Test date: May-2017
Hardware Availability: Oct-2016
Software Availability: Sep-2016

Peak Optimization Flags (Continued)

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
-qopt-mem-layout-trans=3 -Wl,-z,muldefs
-L/sh10.2 -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-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

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 13 June 2017.