Dell Inc.

PowerEdge FC830 (Intel Xeon E5-4660 v4, 2.20 GHz)

| SPECint®2006 = | 63.2 |
| SPECint_base2006 = | 61.2 |

CPU2006 license: 55
Test date: May-2016

Test sponsor: Dell Inc.
Hardware Availability: Jun-2016

Tested by: Dell Inc.
Software Availability: Mar-2016

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**Hardware**

- **CPU Name:** Intel Xeon E5-4660 v4
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.00 GHz
- **CPU MHz:** 2200
- **FPU:** Integrated
- **CPU(s) enabled:** 64 cores, 4 chips, 16 cores/chip, 2 threads/core
- **CPU(s) orderable:** 2,4 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:** 40 MB I+D on chip per chip
- **Other Cache:** None
- **Memory:** 512 GB (32 x 16 GB 2Rx8 PC4-2400T-R)
- **Disk Subsystem:** 1 x 800 GB SATA SSD
- **Other Hardware:** None

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**Software**

- **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:** Yes
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 32/64-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** Microquill SmartHeap V10.2
**SPEC CINT2006 Result**

Dell Inc.

PowerEdge FC830 (Intel Xeon E5-4660 v4, 2.20 GHz)

**SPECint2006 =** 63.2

**SPECint_base2006 =** 61.2

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**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>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>278</td>
<td>35.2</td>
<td>278</td>
<td>35.1</td>
<td>276</td>
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<td>403.gcc</td>
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<td>32.3</td>
<td>249</td>
<td>32.3</td>
<td>247</td>
<td>32.6</td>
<td>429.mcf</td>
<td>169</td>
<td>53.9</td>
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<td>445.gobmk</td>
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<td>405</td>
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<td>456.hmmer</td>
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<td>401</td>
<td>30.2</td>
<td>401</td>
<td>30.2</td>
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<td>30.5</td>
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<td>462.libquantum</td>
<td>2.36</td>
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<td>2.32</td>
<td>8930</td>
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<td>8780</td>
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<tr>
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<td>40.7</td>
<td>147</td>
<td>42.6</td>
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<td>48.7</td>
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<td>48.6</td>
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<tr>
<td>473.astar</td>
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<td>31.6</td>
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<td>31.7</td>
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<td>31.6</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>109</td>
<td>63.5</td>
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<td>63.6</td>
<td>99.3</td>
<td>69.5</td>
<td>99.8</td>
<td>69.1</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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**Submit Notes**

The config file option 'submit' was used.

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**Operating System Notes**

Stack size set to unlimited using "ulimit -s unlimited"

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**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

Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-4pvp Fri May  6 11:51:34 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

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Dell Inc.
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Platform Notes (Continued)

From /proc/cpuinfo
  model name : Intel(R) Xeon(R) CPU E5-4660 v4 @ 2.20GHz
  4 "physical id"s (chips)
  128 "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 : 16
    siblings : 32
    physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  cache size : 40960 KB

From /proc/meminfo
  MemTotal:       529326748 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:
    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 May 6 11:38

SPEC is set to: /root/cpu2006-1.2
  Filesystem    Type  Size  Used Avail Use% Mounted on
  /dev/sda2      xfs 271G  12G 260G  5% /

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program
Continued on next page
SPEC CINT2006 Result

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Platform Notes (Continued)

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. 2.0.2 04/14/2016
Memory:
  5x 002C0B3002C 18ASF2G72PD2-2G3A1 16 GB 2 rank 2400 MHz
  19x 00AD00B300AD HMA82GR7MFR8N-UH 16 GB 2 rank 2400 MHz
  8x 00AD063200AD HMA82GR7MFR8N-UH 16 GB 2 rank 2400 MHz
  16x 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/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
OMP_NUM_THREADS = "64"

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
  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
  473.astar: -DSPEC_CPU_LP64

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Base Portability Flags (Continued)

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

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_2016/linux/compiler/lib/ia32_lin

C++ benchmarks (except as noted below):
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

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: -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: -D_FILE_OFFSET_BITS=64

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SPEC CINT2006 Result

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Peak Portability Flags (Continued)

473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -xCORE-AVX2(pas passive 2) -prof-gen:threadsafe(pass passive 1)
-ipo(pass passive 2) -O3(pass passive 2) -no-prec-div(pass passive 2)
-par-num-threads=1(pass passive 1) -prof-use(pass passive 2) -opt-prefetch
-ansi-alias

401.bzip2: -xCORE-AVX2(pas passive 2) -prof-gen:threadsafe(pass passive 1)
-ipo(pass passive 2) -O3(pass passive 2) -no-prec-div
-par-num-threads=1(pass passive 1) -prof-use(pass passive 2) -auto-ipl32
-opt-prefetch -ansi-alias

403.gcc: basepeak = yes

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

445.gobmk: basepeak = yes

456.hmmer: basepeak = yes

458.sjeng: -xCORE-AVX2(pas passive 2) -prof-gen:threadsafe(pass passive 1)
-ipo(pass passive 2) -O3(pass passive 2) -no-prec-div(pass passive 2)
-par-num-threads=1(pass passive 1) -prof-use(pass passive 2) -unroll4

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pas passive 2) -prof-gen:threadsafe(pass passive 1)
-ipo(pass passive 2) -O3(pass passive 2) -no-prec-div(pass passive 2)
-par-num-threads=1(pass passive 1) -prof-use(pass passive 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
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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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