### Dell Inc.

PowerEdge R430 (Intel Xeon E5-1620 v4, 3.50 GHz)

<table>
<thead>
<tr>
<th>SPECint®_rate2006</th>
<th>248</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>236</td>
</tr>
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</table>

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

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Operating System: SUSE Linux Enterprise Server 12 SP1 3.12.49-11-default</td>
</tr>
<tr>
<td>CPU Characteristics: Intel Xeon E5-1620 v4</td>
<td>Compiler: C/C++: Version 16.0.2.181 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>Auto Parallel: No</td>
</tr>
<tr>
<td>3500</td>
<td>File System: ext4</td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>Base Pointers: 32-bit</td>
</tr>
<tr>
<td>4 cores, 1 chip, 4 cores/chip, 2 threads/core</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>CPU(s) orderable: 1 chip</td>
<td>Other Software: Microquill SmartHeap V10.2</td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td></td>
</tr>
<tr>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
<td></td>
</tr>
<tr>
<td>L3 Cache: 10 MB I+D on chip per chip</td>
<td></td>
</tr>
<tr>
<td>Other Cache: None</td>
<td></td>
</tr>
<tr>
<td>Memory: 128 GB (8 x 16 GB 2Rx8 PC4-2400T-R)</td>
<td></td>
</tr>
<tr>
<td>Disk Subsystem: 1 x 250 GB 7200 RPM SATA HDD</td>
<td></td>
</tr>
<tr>
<td>Other Hardware: None</td>
<td></td>
</tr>
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SPEC CINT2006 Result

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Results Table

<table>
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<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base</td>
<td></td>
<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400.perlbench</td>
<td>8</td>
<td>463</td>
<td>169</td>
<td>462</td>
<td>169</td>
<td>463</td>
<td>169</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>8</td>
<td>683</td>
<td>113</td>
<td>683</td>
<td>113</td>
<td>684</td>
<td>113</td>
</tr>
<tr>
<td>403.gcc</td>
<td>8</td>
<td>376</td>
<td>171</td>
<td>376</td>
<td>171</td>
<td>375</td>
<td>172</td>
</tr>
<tr>
<td>429.mcf</td>
<td>8</td>
<td>241</td>
<td>302</td>
<td>242</td>
<td>301</td>
<td>243</td>
<td>301</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>8</td>
<td>555</td>
<td>151</td>
<td>556</td>
<td>151</td>
<td>556</td>
<td>151</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>8</td>
<td>209</td>
<td>357</td>
<td>209</td>
<td>357</td>
<td>209</td>
<td>357</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>8</td>
<td>609</td>
<td>159</td>
<td>608</td>
<td>159</td>
<td>607</td>
<td>159</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>8</td>
<td>69.7</td>
<td>2380</td>
<td>69.6</td>
<td>2380</td>
<td>69.6</td>
<td>2380</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>8</td>
<td>640</td>
<td>277</td>
<td>642</td>
<td>276</td>
<td>642</td>
<td>276</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>8</td>
<td>405</td>
<td>124</td>
<td>405</td>
<td>124</td>
<td>404</td>
<td>124</td>
</tr>
<tr>
<td>473.astar</td>
<td>8</td>
<td>386</td>
<td>145</td>
<td>388</td>
<td>145</td>
<td>388</td>
<td>145</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>8</td>
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<td>297</td>
<td>185</td>
<td>298</td>
<td>186</td>
<td>297</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 Opportunistic Snoop Broadcast
Virtualization Technology disabled
System Profile set to custom
CPU Power Management set to Hardware P States
C States set to Autonomous
C1E disabled
Energy Efficient Turbo disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Balanced Performance
Memory Patrol Scrub disabled
Sysinfo program //root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-n1xa Fri Jun 17 14:24:18 2016

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 R430 (Intel Xeon E5-1620 v4, 3.50 GHz)

SPECint_rate2006 = 248
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CPU2006 license: 55
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Tested by: Dell Inc.
Test date: Jun-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

Platform Notes (Continued)

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

From /proc/cpuinfo
model name: Intel(R) Xeon(R) CPU E5-1620 v4 @ 3.50GHz
 1 "physical id"s (chips)
8 "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: 4
siblings: 8
physical 0: cores 0 1 2 3
cache size: 10240 KB

From /proc/meminfo
MemTotal: 132054576 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:
Linux linux-n1xa 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Jun 17 14:22

SPEC is set to: //root/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 ext4 221G 8.8G 212G 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
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Platform Notes (Continued)

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

BIOS Dell Inc. 2.0.1 04/11/2016
Memory:
  4x 0OAD063200AD HMA82GR7MFR8N-UH 16 GB 2 rank 2400 MHz
  4x 00CE00B300CE M393A2K43BB1-CRC 16 GB 2 rank 2400 MHz
  4x 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/sh"

Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB memory using RedHat EL 7.2 glibc 2.17
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
runcase command invoked through numactl i.e.:
umactl --interleave=all runcase <etc>

Base Compiler Invocation

C benchmarks:
  icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

C++ benchmarks:
  icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

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.libquantum: -D_FILE_OFFSET_BITS=64
462.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
  473.astar: -D_FILE_OFFSET_BITS=64

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Base Portability Flags (Continued)
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -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

Peak Compiler Invocation
C benchmarks (except as noted below):
icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

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_2016/linux/compiler/lib/ia32_lin

Peak Portability Flags
400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -D_FILE_OFFSET_BITS=64

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Peak Portability Flags (Continued)

- 456.hmmer: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
- 458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
- 462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
- 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

Peak Optimization Flags

C benchmarks:

- 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) -auto-ilp32
- 401.bzip2: -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
  -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:threadsafe(pass 1)
  -prof-use(pass 2) -par-num-threads=1(pass 1) -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:threadsafe(pass 1)
  -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
  -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll14
  -auto-ilp32
- 462.libquantum: basepeak = yes
- 464.h264ref: -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) -unroll12
  -ansi-alias

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) -ansi-alias
  -opt-ra-region-strategy=block -Wl,-z,muldefs

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**SPECint_rate2006 = 248**

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**Peak Optimization Flags (Continued)**

471.omnetpp (continued):

- -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-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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