**SPEC® CINT2006 Result**

Dell Inc.

PowerEdge R940  
(Intel Xeon Gold 6152, 2.10 GHz)

| SPECint Rate2006 | 4110 |
| SPECint_rate_base2006 | 3910 |

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

### Hardware

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Gold 6152</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2100</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>88 cores, 4 chips, 22 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>2,4 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>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>30.25 MB I+D on chip per core</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>768 GB (48 x 16 GB 2Rx8 PC4-2666V-R)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 900 GB 15K RPM SAS12</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System:</td>
<td>SUSE Linux Enterprise Server 12 (x86_64) SP2 4.4.21-69-default</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 17.0.3.191 of Intel C/C++ Compiler 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-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>

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Dell Inc.

PowerEdge R940 (Intel Xeon Gold 6152, 2.10 GHz)
Dell Inc.  
PowerEdge R940  
(Intel Xeon Gold 6152, 2.10 GHz)

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

SPECint_rate2006 = 4110  
SPECint_rate_base2006 = 3910

Results Table

<table>
<thead>
<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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>176</td>
<td>586</td>
<td>2930</td>
<td>587</td>
<td>2930</td>
<td>589</td>
<td>2920</td>
<td>176</td>
<td>485</td>
<td>3550</td>
<td>484</td>
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<tr>
<td>401.bzip2</td>
<td>176</td>
<td>955</td>
<td>1780</td>
<td>965</td>
<td>1760</td>
<td>960</td>
<td>1770</td>
<td>176</td>
<td>921</td>
<td>1840</td>
<td>908</td>
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<td>403.gcc</td>
<td>176</td>
<td>498</td>
<td>2840</td>
<td>500</td>
<td>2830</td>
<td>498</td>
<td>2840</td>
<td>176</td>
<td>496</td>
<td>2860</td>
<td>498</td>
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<td>429.mcf</td>
<td>176</td>
<td>308</td>
<td>5210</td>
<td>305</td>
<td>5260</td>
<td>306</td>
<td>5250</td>
<td>176</td>
<td>308</td>
<td>5210</td>
<td>305</td>
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<td>445.gobmk</td>
<td>176</td>
<td>784</td>
<td>2350</td>
<td>784</td>
<td>2360</td>
<td>785</td>
<td>2350</td>
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<td>786</td>
<td>2350</td>
<td>786</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>176</td>
<td>306</td>
<td>5360</td>
<td>308</td>
<td>5340</td>
<td>307</td>
<td>5340</td>
<td>176</td>
<td>260</td>
<td>6320</td>
<td>261</td>
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<td>458.sjeng</td>
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<td>2520</td>
<td>844</td>
<td>2520</td>
<td>845</td>
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<tr>
<td>462.libquantum</td>
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<td>57.0</td>
<td>63900</td>
<td>57.0</td>
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<td>64000</td>
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<td>57.0</td>
<td>63900</td>
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<td>464.h264ref</td>
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<td>910</td>
<td>4280</td>
<td>898</td>
<td>4340</td>
<td>906</td>
<td>4300</td>
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<td>863</td>
<td>4510</td>
<td>849</td>
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<tr>
<td>471.omnetpp</td>
<td>176</td>
<td>547</td>
<td>2010</td>
<td>546</td>
<td>2010</td>
<td>546</td>
<td>2020</td>
<td>176</td>
<td>519</td>
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<tr>
<td>473.astar</td>
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<td>576</td>
<td>2150</td>
<td>574</td>
<td>2150</td>
<td>575</td>
<td>2150</td>
<td>176</td>
<td>576</td>
<td>2150</td>
<td>576</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>176</td>
<td>280</td>
<td>4340</td>
<td>280</td>
<td>4340</td>
<td>279</td>
<td>4350</td>
<td>176</td>
<td>280</td>
<td>4340</td>
<td>279</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

Kernel boot parameter: nohz_full=1-175  
Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

BIOS settings:  
Logical Processor Enabled  
Virtualization Technology Disabled  
Sub NUMA Cluster Enabled  
System Profile set to Custom  
CPU Performance set to Maximum Performance  
C1E Disabled  
C States set to Autonomous  
Uncore Frequency set to Dynamic  
Memory Patrol Scrub Disabled  
Energy Efficiency Policy set to Performance  
CPU Interconnect Bus Link Power Management Disabled  
PCI ASPM L1 Link Power Management Disabled  
Sysinfo program /home/cpu2006/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
running on linux-apb2 Wed Oct 18 09:18:48 2017

Continued on next page
Dell Inc.
PowerEdge R940
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SPECint_rate2006 = 4110
SPECint_rate_base2006 = 3910

CPU2006 license: 55
Test sponsor: Dell Inc.
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Test date: Oct-2017
Hardware Availability: Sep-2017
Software Availability: Apr-2017

Platform Notes (Continued)

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) Gold 6152 CPU @ 2.10GHz
4 "physical id"s (chips)
176 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
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
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 3: 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 : 30976 KB

From /proc/meminfo
MemTotal: 791224268 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2
# 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-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

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### Platform Notes (Continued)

run-level 3 Oct 18 09:18

SPEC is set to: /home/cpu2006

Filesystem | Type | Size | Used | Avail | Use% | Mounted on |
/dev/sda4 | xfs | 796G | 17G | 779G | 3% | /home |

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 SMBIOS" standard.

BIOS Dell Inc. 1.1.7 08/10/2017

Memory:
- 12x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666 MHz
- 12x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666 MHz
- 24x 00CE063200CE M393A2K43BB1-CTD 16 GB 2 rank 2666 MHz

(End of data from sysinfo program)

---

### General Notes

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

```
LD_LIBRARY_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"
```

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:

```
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
```

runcspec 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
```

Continued on next page
## SPEC CINT2006 Result

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</tr>
</tbody>
</table>

### Base 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: `-D_FILE_OFFSET_BITS=64`
- 458.sjeng: `-D_FILE_OFFSET_BITS=64`
- 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`

### Base Optimization Flags

**C benchmarks:**

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-qopt-mem-layout-trans=3`

**C++ benchmarks:**

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -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_2017/linux/lib/ia32`
- `icc -m64`
- `icc -m64`
- `icc -m64`
- `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
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.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: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(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-AVX512(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-AVX512 -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-AVX512(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-AVX512 -ipo -O3 -no-prec-div -unroll12 -auto-ilp32
-qopt-mem-layout-trans=3

458.sjeng: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll14 -auto-ilp32
-qopt-mem-layout-trans=3

462.libquantum: basepeak = yes

464.h264ref: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll12 -qopt-mem-layout-trans=3
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Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(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 -W1,-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-revF.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-revF.xml

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For other inquiries, please contact webmaster@spec.org.

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