### Dell Inc.

**PowerEdge R940**  
(Intel Xeon Gold 6132, 2.60 GHz)

<table>
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<th>SPECint_rate_base2006 = 2990</th>
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<tr>
<th>Test date:</th>
<th>Oct-2017</th>
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<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Sep-2017</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Apr-2017</td>
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</table>

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

**Software**

- Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP2 4.4.21-69-default
- Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux
- Auto Parallel: Yes
- File System: xfs
- System State: Run level 3 (multi-user)
- Base Pointers: 32-bit
- Peak Pointers: 32/64-bit
- Other Software: Microquill SmartHeap V10.2

**Hardware**

- **CPU Name:** Intel Xeon Gold 6132
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.70 GHz
- **CPU MHz:** 2600
- **FPU:** Integrated
- **CPU(s) enabled:** 56 cores, 4 chips, 14 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:** 1 MB I+D on chip per core
- **L3 Cache:** 19.25 MB I+D on chip per core
- **Other Cache:** None
- **Memory:** 768 GB (48 x 16 GB 2Rx8 PC4-2666V-R)
- **Disk Subsystem:** 1 x 900 GB 15K RPM SAS12
- **Other Hardware:** None

**400.perlbench**

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</table>

**401.bzip2**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**403.gcc**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**429.mcf**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**445.gobmk**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**456.hmmer**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**458.sjeng**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**462.libquantum**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**464.h264ref**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**471.omnetpp**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**473.astar**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**483.xalancbmk**

|        | 112 | 2720 | 2240 | 1360 | 1280  | 2140  | 2140  | 3930  | 5170  | 4230  | 1930  | 50100 |

**SPECint_rate_base2006 = 2990**

**SPECint_rate2006 = 3160**
Dell Inc.

PowerEdge R940
(Intel Xeon Gold 6132, 2.60 GHz)

SPECint_rate2006 = 3160
SPECint_rate_base2006 = 2990

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

Test date: Oct-2017
Hardware Availability: Sep-2017
Software Availability: Apr-2017

Results Table

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<td>112</td>
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</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=1-111
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-2h8y Thu Oct 12 19:44:30 2017
Continued on next page
Dell Inc. 

PowerEdge R940 
(Intel Xeon Gold 6132, 2.60 GHz)

SPECint_rate2006 = 3160
SPECint_rate_base2006 = 2990

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

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 6132 CPU @ 2.60GHz
4 "physical id"s (chips)
112 "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 : 14
siblings : 28
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size : 19712 KB

From /proc/meminfo
MemTotal: 791224272 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:
Linux linux-2h8y 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 12 19:44

SPEC is set to: /home/cpu2006

Continued on next page
Dell Inc.
PowerEdge R940
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**SPECint_rate2006 =** 3160  
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**Platform Notes (Continued)**

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:
48x 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
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
**SPEC CINT2006 Result**

**Dell Inc.**

PowerEdge R940  
(Intel Xeon Gold 6132, 2.60 GHz)

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<th>SPECint_rate2006 =</th>
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<td>SPECint_rate_base2006 =</td>
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**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test date:** Oct-2017  
**Hardware Availability:** Sep-2017  
**Software Availability:** Apr-2017

### 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-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

- 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
**SPEC CINT2006 Result**

**Dell Inc.**
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**SPECint_rate2006 = 3160**  
**SPECint_rate_base2006 = 2990**

- CPU2006 license: 55  
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- 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.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 -unroll2 -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) -unroll4 -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) -unroll2 -qopt-mem-layout-trans=3`
SPEC CINT2006 Result

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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 -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-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 questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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