# SPEC® CINT2006 Result

## Dell Inc.

**PowerEdge R640 (Intel Xeon Gold 6150, 2.70 GHz)**

### SPECint<sup>®</sup>_rate2006 = 2020

### SPECint_rate_base2006 = 1930

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System: SUSE Linux Enterprise Server 12 SP2 4.4.21-69-default</td>
<td>CPU Name: Intel Xeon Gold 6150</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux</td>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
<td>CPU MHZ: 2700</td>
</tr>
<tr>
<td>File System: xfs</td>
<td>CPU(s) enabled: 36 cores, 2 chips, 18 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>CPU(s) orderable: 1,2 chip</td>
</tr>
<tr>
<td>Base Pointers: 32-bit</td>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>Secondary Cache: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Other Software: Microquill SmartHeap V10.2</td>
<td>L3 Cache: 24.75 MB I+D on chip per chip</td>
</tr>
</tbody>
</table>

### Test date: May-2017

### Hardware Availability: Jul-2017

### CPU2006 license: 55

### Test sponsor: Dell Inc.

### Tested by: Dell Inc.

### Test date: May-2017

### Hardware Availability: Jul-2017

### Test sponsor: Dell Inc.

### Tested by: Dell Inc.

### Software Availability: Nov-2016

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### Hardware Availability: Jul-2017

### Test sponsor: Dell Inc.

### Tested by: Dell Inc.
Dell Inc.

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CPU2006 license: 55
Test sponsor: Dell Inc.
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Hardware Availability: Jul-2017
Software Availability: Nov-2016

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>
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<th>Seconds</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Base</td>
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<td>Peak</td>
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<td></td>
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<tr>
<td>400.perlbench</td>
<td>72</td>
<td>471</td>
<td>1490</td>
<td>72</td>
<td>471</td>
<td>1490</td>
<td>72</td>
<td>471</td>
<td>1490</td>
<td>72</td>
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<tr>
<td>401.bzip2</td>
<td>72</td>
<td>820</td>
<td>848</td>
<td>72</td>
<td>820</td>
<td>848</td>
<td>72</td>
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<td>848</td>
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<tr>
<td>403.gcc</td>
<td>72</td>
<td>427</td>
<td>1360</td>
<td>72</td>
<td>427</td>
<td>1360</td>
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<td>429.mcf</td>
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<td>2490</td>
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<td>445.gobmk</td>
<td>72</td>
<td>627</td>
<td>1200</td>
<td>72</td>
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<td>1200</td>
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<td>456.hmmer</td>
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<td>458.sjeng</td>
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<td>462.libquantum</td>
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<td>464.h264ref</td>
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<tr>
<td>471.omnetpp</td>
<td>72</td>
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<td>931</td>
<td>72</td>
<td>484</td>
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<td>72</td>
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<td>931</td>
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<tr>
<td>473.astar</td>
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<td>477</td>
<td>1060</td>
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<td>1060</td>
<td>72</td>
<td>477</td>
<td>1060</td>
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<tr>
<td>483.xalancbmk</td>
<td>72</td>
<td>234</td>
<td>2120</td>
<td>72</td>
<td>234</td>
<td>2130</td>
<td>72</td>
<td>234</td>
<td>2130</td>
<td>72</td>
<td>234</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:
Sub NUMA Cluster enabled
Virtualization Technology disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to autonomous
C1E disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
Logical Processor enabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM Li Link Power Management disabled
Sysinfo program /root/cpu2006-1.2_ic17u3/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-6cje Tue May 16 18:25:17 2017

Continued on next page
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 6150 CPU @ 2.70GHz
2 "physical id"s (chips)
72 "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 : 18
siblings : 36
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 25344 KB

From /proc/meminfo

MemTotal:       394732800 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-6cje 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
(x86_64) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 16 18:24

SPEC is set to: /root/cpu2006-1.2_ic17u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 370G 15G 356G 4% /
Additional information from dmidecode:
Continued on next page
Dell Inc.

PowerEdge R640 (Intel Xeon Gold 6150, 2.70 GHz)

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CPU2006 license: 55
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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. 0.5.5 04/27/2017
Memory:
12x 00AD063200AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666 MHz
12x 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 = "/root/cpu2006-1.2_ic17u3/lib/ia32:/root/cpu2006-1.2_ic17u3/lib/intel64:/root/cpu2006-1.2_ic17u3/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
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_OFFSETBITS=64 -DSPEC_CPU_LINUX_IA32
401.bzip2: -D_FILE_OFFSETBITS=64
403.gcc: -D_FILE_OFFSETBITS=64
429.mcf: -D_FILE_OFFSETBITS=64
445.gobmk: -D_FILE_OFFSETBITS=64
456.hmmer: -D_FILE_OFFSETBITS=64
458.sjeng: -D_FILE_OFFSETBITS=64
462.libquantum: -D_FILE_OFFSETBITS=64 -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSETBITS=64
471.omnetpp: -D_FILE_OFFSETBITS=64

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SPEC CINT2006 Result

Dell Inc.

PowerEdge R640 (Intel Xeon Gold 6150, 2.70 GHz)

**SPECint\_rate2006 = 2020**

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<tr>
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<th>Test date: May-2017</th>
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</tbody>
</table>

**Base Portability Flags (Continued)**

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
403.gcc: -D\_FILE\_OFFSET\_BITS=64
429.mcf: -D\_FILE\_OFFSET\_BITS=64

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Dell Inc.

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Peak Portability Flags (Continued)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>445.gobmk</td>
<td>-D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>-D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>-D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>473.astar</td>
<td>-D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX</td>
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</tbody>
</table>

Peak Optimization Flags

C benchmarks:

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
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</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>-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</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>-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</td>
</tr>
<tr>
<td>403.gcc</td>
<td>-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3</td>
</tr>
<tr>
<td>429.mcf</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>-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</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>-xCORE-AVX512 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32 -qopt-mem-layout-trans=3</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>-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</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>-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</td>
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C++ benchmarks:
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CPU2006 license: 55  
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### Peak Optimization Flags (Continued)

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 other inquiries, please contact webmaster@spec.org.

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