Dell Inc.
PowerEdge R940
(Intel Xeon Gold 6154, 3.00 GHz)

SPEClnt\textsuperscript{2006} = 78.4
SPEClnt\textsubscript{base2006} = 74.7

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon Gold 6154</td>
<td>Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP2 4.4.21-69-default</td>
</tr>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz</td>
<td>Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux</td>
</tr>
<tr>
<td>CPU MHz: 3000</td>
<td>Auto Parallel: Yes</td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>CPU(s) enabled: 72 cores, 4 chips, 18 cores/chip</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>CPU(s) orderable: 2.4 chip</td>
<td>Base Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Secondary Cache: 1 MB I+D on chip per core</td>
<td>Other Software: Microquill SmartHeap V10.2</td>
</tr>
<tr>
<td>L3 Cache: 24.75 MB I+D on chip per chip</td>
<td></td>
</tr>
<tr>
<td>Other Cache: None</td>
<td></td>
</tr>
<tr>
<td>Memory: 768 GB (48 x 16 GB 2Rx8 PC4-2666V-R)</td>
<td></td>
</tr>
<tr>
<td>Disk Subsystem: 1 x 900 GB 15K RPM SAS12</td>
<td></td>
</tr>
<tr>
<td>Other Hardware: None</td>
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</tr>
</tbody>
</table>
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>209</td>
<td>46.7</td>
<td>209</td>
<td>46.7</td>
<td>210</td>
<td>46.6</td>
<td>184</td>
<td>53.1</td>
<td>184</td>
<td>53.1</td>
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<tr>
<td>401.bzip2</td>
<td>340</td>
<td>28.4</td>
<td>342</td>
<td>28.2</td>
<td>341</td>
<td>28.3</td>
<td>341</td>
<td>28.3</td>
<td>340</td>
<td>28.3</td>
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<td>403.mcc</td>
<td>240</td>
<td>33.6</td>
<td>240</td>
<td>33.5</td>
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<td>33.5</td>
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<td>33.2</td>
<td>238</td>
<td>33.8</td>
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<tr>
<td>429.mcf</td>
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<td>77.6</td>
<td>117</td>
<td>77.7</td>
<td>118</td>
<td>77.4</td>
<td>118</td>
<td>77.3</td>
<td>116</td>
<td>78.9</td>
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<tr>
<td>445.gobmk</td>
<td>311</td>
<td>33.7</td>
<td>313</td>
<td>33.5</td>
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<td>33.5</td>
<td>310</td>
<td>33.8</td>
<td>310</td>
<td>33.9</td>
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<tr>
<td>456.hmmer</td>
<td>95.5</td>
<td>97.7</td>
<td>96.5</td>
<td>96.7</td>
<td>95.5</td>
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<td>95.5</td>
<td>97.7</td>
<td>96.5</td>
<td>96.7</td>
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<tr>
<td>458.sjeng</td>
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<td>36.9</td>
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<td>36.9</td>
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<tr>
<td>462.libquantum</td>
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<td>2.30</td>
<td>9020</td>
<td>2.32</td>
<td>8940</td>
<td>2.30</td>
<td>8990</td>
<td>2.30</td>
<td>9020</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>311</td>
<td>71.2</td>
<td>308</td>
<td>71.8</td>
<td>308</td>
<td>71.9</td>
<td>311</td>
<td>71.2</td>
<td>308</td>
<td>71.8</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>178</td>
<td>35.0</td>
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<td>48.7</td>
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<td>48.8</td>
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<tr>
<td>473.astar</td>
<td>179</td>
<td>39.2</td>
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<td>39.1</td>
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<td>39.2</td>
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<td>39.0</td>
<td>180</td>
<td>39.0</td>
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<tr>
<td>483.xalancbmk</td>
<td>84.7</td>
<td>81.5</td>
<td>86.5</td>
<td>79.7</td>
<td>84.1</td>
<td>82.1</td>
<td>75.8</td>
<td>91.1</td>
<td>75.7</td>
<td>91.2</td>
</tr>
</tbody>
</table>

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

## Submit Notes

The config file option 'submit' was used.

## Operating System Notes

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

## Platform Notes

BIOS settings:
- Logical Processor Disabled
- Virtualization Technology Disabled
- Sub NUMA Cluster Disabled
- 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-ehog Mon Oct  9 04:07:54 2017

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
Dell Inc.

PowerEdge R940
(Intel Xeon Gold 6154, 3.00 GHz)

SPECint2006 = 78.4
SPECint_base2006 = 74.7

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)

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

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Gold 6154 CPU @ 3.00GHz
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 : 18
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
physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 3: 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: 791225344 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:
NAME="SLES"
VERSION="12-SP2"

# 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"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

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

run-level 3 Oct 9 04:07

SPEC is set to: /home/cpu2006

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 796G 17G 780G 3% /home

Additional information from dmidecode:

Continued on next page
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Tested by: Dell Inc.  

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. 1.1.7 08/10/2017  
Memory: 48x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666 MHz

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"
OMP_NUM_THREADS = "72"

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

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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SPEC CINT2006 Result

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

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 -qopt-prefetch
-auto-p32

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-Wl,-z,muldefs -L/sh10.2 -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_2017/linux/lib/ia32
445.gobmk: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

C++ benchmarks (except as noted below):
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

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: -D_FILE_OFFSET_BITS=64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64

Continued on next page
Peak Portability Flags (Continued)

462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -D_FILE_OFFSET_BITS=64
    -D_FILE_OFFSET_BITS=64
473.astar: -DSPEC_CPU_LP64
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-AVX2(pass 2)
    -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
    -no-prec-div(pass 2) -qopt-prefetch

401.bzip2: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
    -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
    -no-prec-div -auto-ilp32 -qopt-prefetch

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc
    -qopt-malloc-options=3 -auto-ilp32

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

445.gobmk: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
    -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
    -no-prec-div(pass 2)

456.hmmer: basepeak = yes

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

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
    -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
    -no-prec-div(pass 2) -qopt-ra-region-strategy=block
    -Wl,-z,muldefs -L/sh10.2 -lsmartheap

473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
    -auto-p32 -Wl,-z,muldefs -L/sh10.2 -lsmartheap64

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SPEC CINT2006 Result

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Software Availability: Apr-2017

Peak Optimization Flags (Continued)

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-Wl,-z,muldefs -L/sh10.2 -lsmartheap

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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