Dell Inc.

PowerEdge R640 (Intel Xeon Gold 6138, 2.00 GHz)

SPECfp®_rate2006 = 1410
SPECfp_rate_base2006 = 1370

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

CPU Name: Intel Xeon Gold 6138
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 2000
FPU: Integrated
CPU(s) enabled: 40 cores, 2 chips, 20 cores/chip, 2 threads/core
CPU(s) orderable: 1,2 chip
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core

Operating System: SUSE Linux Enterprise Server 12 SP2
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux;
         Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
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
**SPEC CFP2006 Result**

**Dell Inc.**

**PowerEdge R640 (Intel Xeon Gold 6138, 2.00 GHz)**

| SPECfp_rate2006 = | 1410 |
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**CPU2006 license:** 55  
**Test date:** May-2017  
**Test sponsor:** Dell Inc.  
**Hardware Availability:** Jul-2017  
**Tested by:** Dell Inc.  
**Software Availability:** Nov-2016

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**Platform Notes (Continued)**

- 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 L1 Link Power Management disabled

Sysinfo program /root/cpu2006-1.2.icl17u3/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
runtime on Linux-zadj Thu May 18 08:23:27 2017

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 6138 CPU @ 2.00GHz
- 2 "physical id"s (chips)
- 80 "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 : 20
  - siblings : 40
  - physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  - physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
- cache size : 28160 KB

**From /proc/meminfo**

- MemTotal: 394863120 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"

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Platform Notes (Continued)

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

run-level 3 May 17 21:04
SPEC is set to: /root/cpu2006-1.2_ic17u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 368G 22G 347G 6% /

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. 0.5.5 04/27/2017
Memory:
   10x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666 MHz
   14x 00AD063200AD HMA82GR7AFR8N-VK 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 -m64

C++ benchmarks:
   icpc -m64

Continued on next page
SPEC CFP2006 Result

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Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
SPEC CFP2006 Result

Dell Inc.
PowerEdge R640 (Intel Xeon Gold 6138, 2.00 GHz)

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Peak CompilerInvocation

C benchmarks:
  icc -m64

C++ benchmarks (except as noted below):
  icpc -m64

  450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

Fortran benchmarks:
  ifort -m64

Benchmarks using both Fortran and C:
  icc -m64 ifort -m64

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -D_FILE_OFFSET_BITS=64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:
  433.milc: basepeak = yes
  470.lbm: basepeak = yes
  482.sphinx3: basepeak = yes

C++ benchmarks:

Continued on next page
Dell Inc.
PowerEdge R640 (Intel Xeon Gold 6138, 2.00 GHz)

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**Peak Optimization Flags (Continued)**

444.namd:  
-prof-gen(pass 1)  
-prof-use(pass 2)  
-xCORE-AVX512(pass 2)  
-par-num-threads=1(pass 1)  
-ipo(pass 2)  
-no-prec-div(pass 2)  
-fno-alias  
-auto-ilp32  
-qopt-mem-layout-trans=3

447.dealII: basepeak = yes

450.soplex:  
-prof-gen(pass 1)  
-prof-use(pass 2)  
-xCORE-AVX512(pass 2)  
-par-num-threads=1(pass 1)  
-ipo(pass 2)  
-no-prec-div(pass 2)  
-qopt-malloc-options=3  
-qopt-mem-layout-trans=3

453.povray:  
-prof-gen(pass 1)  
-prof-use(pass 2)  
-xCORE-AVX512(pass 2)  
-par-num-threads=1(pass 1)  
-ipo(pass 2)  
-no-prec-div(pass 2)  
-unroll4  
-qopt-mem-layout-trans=3

Fortran benchmarks:

410.bwaves:  
-xCORE-AVX512  
-ipo  
-no-prec-div  
-qopt-prefetch

416.gamess:  
-prof-gen(pass 1)  
-prof-use(pass 2)  
-xCORE-AVX512(pass 2)  
-par-num-threads=1(pass 1)  
-ipo(pass 2)  
-no-prec-div(pass 2)  
-qopt-malloc-options=3  
-auto-ilp32  
-qopt-prefetch  
-qopt-mem-layout-trans=3

434.zeusmp: basepeak = yes

437.leslie3d: Same as 410.bwaves

459.GemsFDTD: Same as 410.bwaves

465.tonto:  
-prof-gen(pass 1)  
-prof-use(pass 2)  
-xCORE-AVX512(pass 2)  
-par-num-threads=1(pass 1)  
-ipo(pass 2)  
-no-prec-div(pass 2)  
-unroll4  
-auto  
-qopt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs:  
-prof-gen(pass 1)  
-prof-use(pass 2)  
-xCORE-AVX512(pass 2)  
-par-num-threads=1(pass 1)  
-qopt-prefetch  
-auto-ilp32  
-qopt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes
SPEC CFP2006 Result

Dell Inc.

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<table>
<thead>
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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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