Dell Inc.  
PowerEdge C6320 (Intel Xeon E5-2637 v4, 3.50 GHz)  

SPECint\textsubscript{rate\_2006} = 500  
SPECint\textsubscript{rate\_base\_2006} = 475  

CPU\textsubscript{2006} license: 55  
Test sponsor: Dell Inc.  
Tested by: Dell Inc.  

Hardware  
CPU Name: Intel Xeon E5-2637 v4  
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
CPU MHz: 3500  
FPU: Integrated  
CPU(s) enabled: 8 cores, 2 chips, 4 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: 256 KB I+D on chip per core  
L3 Cache: 15 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (8 x 32 GB 2Rx8 PC4-2400T-R)  
Disk Subsystem: 1 TB SATA 7.2K  
Other Hardware: None  

Software  
Operating System: SUSE Linux Enterprise Server 12 SP3 (x86\_64)  
Compiler: C++ Version 16.0.2.181 of Intel C++ Studio XE for Linux  
Auto Parallel: No  
File System: btrfs  
System State: Run level 3 (multi-user)  
Base Pointers: 32-bit  
Peak Pointers: 32/64-bit  
Other Software: Microquill SmartHeap V10.2  

16 copies  
400.perlbench  
401.bzip2  
403.gcc  
429.mcf  
445.gobmk  
456.hmmer  
458.sjeng  
462.libquantum  
464.h264ref  
471.omnetpp  
473.astar  
483.xalancbmk  

SPECint\textsubscript{rate\_base\_2006} = 475  

SPECint\textsubscript{rate\_2006} = 500  

Test date: Jul-2017  
Hardware Availability: Jun-2016  
Software Availability: Mar-2016
Dell Inc.

PowerEdge C6320 (Intel Xeon E5-2637 v4, 3.50 GHz)

SPECrate2006 = 500
SPECrate_base2006 = 475

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>Base</td>
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<td>Peak</td>
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<td>403.gcc</td>
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<td>429.mcf</td>
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<td>462.libquantum</td>
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<td>464.h264ref</td>
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<td>555</td>
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<td>471.omnetpp</td>
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<td>429</td>
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<td>428</td>
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<tr>
<td>473.astar</td>
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<tr>
<td>483.xalancbmk</td>
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<td>613</td>
<td>180</td>
<td>613</td>
<td>180</td>
<td>613</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:
Snoop Mode set to Cluster on Die
Virtualization Technology disabled
System Profile set to custom
CPU Performance set to Hardware P States
C States set to Autonomous
C1E disabled
Energy Efficient Turbo disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Balanced Performance
Memory Patrol Scrub disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-jze7 Fri Jul 7 22:41:50 2017

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
Dell Inc.

PowerEdge C6320 (Intel Xeon E5-2637 v4, 3.50 GHz)

SPEC CINT2006 Result

SPECint_rate2006 = 500
SPECint_rate_base2006 = 475

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

Test date: Jul-2017
Hardware Availability: Jun-2016
Software Availability: Mar-2016

Platform Notes (Continued)

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

From /proc/cpuinfo
- model name : Intel(R) Xeon(R) CPU E5-2637 v4@3.50GHz
  - 2 "physical id"s (chips)
  - 16 "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 : 4
  - siblings : 8
  - physical 0: cores 0 1 2 3
  - physical 1: cores 0 1 2 3
- cache size : 15360 KB

From /proc/meminfo
- MemTotal: 264036184 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
- SuSE-release:
  - SUSE Linux Enterprise Server 12 (x86_64)
  - VERSION = 12
  - PATCHLEVEL = 3
  - # 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-SP3"
  - VERSION_ID="12.3"
  - PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
  - ID="sles"
  - ANSI_COLOR="0;32"
  - CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
- Linux linux-jze7 4.4.70-2-default #1 SMP Wed Jun 7 15:12:06 UTC 2017
  (4502c76) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 7 22:36

SPEC is set to: /root/cpu2006-1.2

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 930G 7.5G 921G 1% /

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.

Continued on next page
### Platform Notes (Continued)

- BIOS Dell Inc. 2.5.0 12/05/2016
- Memory:
  - 6x 00AD00B300AD HMA84GR7MFR4N-UH 32 GB 2 rank 2400 MHz
  - 2x 00CE00B300CE M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz
  - 8x Not Specified Not Specified

(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/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
```

Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB memory using RedHat EL 7.2 glibc 2.17
Transparent Huge Pages enabled with:
```
echo always > /sys/kernel/mm/transparent_hugepage/enabled
```
Filesystem page cache cleared with:
```
echo 1 > /proc/sys/vm/drop_caches
```
runcpec command invoked through numactl i.e.:
```
numactl --interleave=all runspec <etc>
```

### Base Compiler Invocation

- **C benchmarks:**
  - icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

- **C++ benchmarks:**
  - icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

### 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`
- 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`
SPEC CINT2006 Result

Dell Inc.  
PowerEdge C6320 (Intel Xeon E5-2637 v4, 3.50 GHz)

SPECint_rate2006 = 500  
SPECint_rate_base2006 = 475

CPU2006 license: 55  
Test sponsor: Dell Inc.  
Test date: Jul-2017  
Tested by: Dell Inc.  
Hardware Availability: Jun-2016  
Software Availability: Mar-2016

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch  
-opt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch  
-opt-mem-layout-trans=3 -W1,-z,muldefs -L/sh -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_2016/linux/compiler/lib/ia32_lin

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_2016/linux/compiler/lib/ia32_lin

Peak Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
403.gcc: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
429.mcf: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
445.gobmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
456.hmmer: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
464.h264ref: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
471.omnetpp: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
473.astar: -D_FILE_OFFSET_BITS=64

Continued on next page
Peak Portability Flags (Continued)

483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlb benchmark: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
   -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
   -par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32

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

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

429.mcf: basepeak = yes

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
   -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias
   -opt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
   -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
   -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
   -auto-ilp32

462.libquantum: basepeak = yes

464.h264ref: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
   -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
   -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
   -ansi-alias

C++ benchmarks:

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

473.astar: basepeak = yes

Continued on next page
SPEC CINT2006 Result

Dell Inc.

PowerEdge C6320 (Intel Xeon E5-2637 v4, 3.50 GHz)

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

Test date: Jul-2017
Hardware Availability: Jun-2016
Software Availability: Mar-2016

Peak Optimization Flags (Continued)

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


You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64-revB.xml

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

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