SPEC® CINT2006 Result
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Dell Inc.
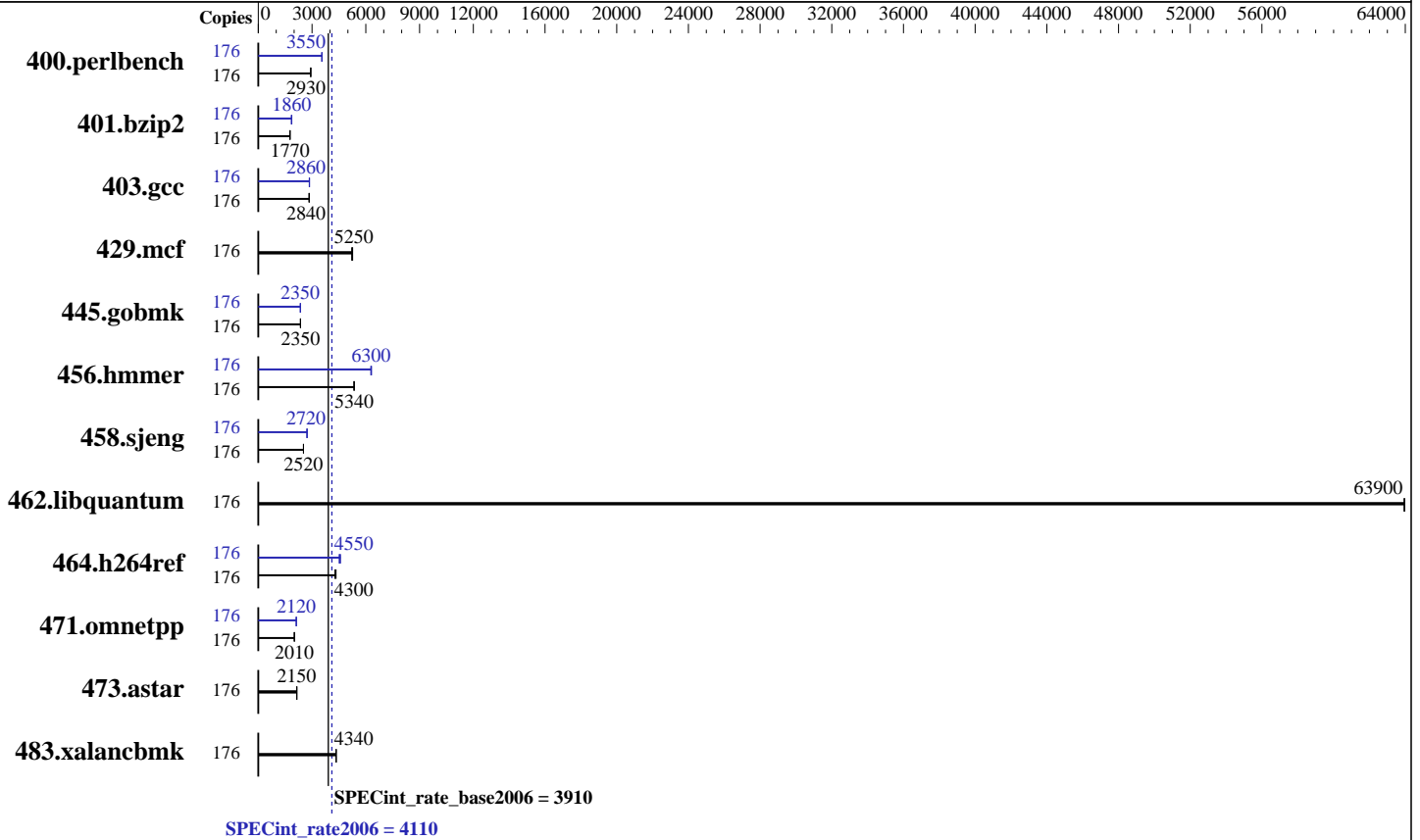
PowerEdge R940
(Intel Xeon Gold 6152, 2.10 GHz)

SPECint®_rate2006 =   4110

SPECint_rate_base2006 = 3910

CPU2006 license: 55

Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Oct-2017

Hardware Availability: Sep-2017

Software Availability: Apr-2017

Copies		
400.perlbench	176	3550
	176	2930
401.bzip2	176	1860
	176	1770
403.gcc	176	2860
	176	2840
429.mcf	176	5250
445.gobmk	176	2350
	176	2350
456.hmmer	176	6300
	176	5340
458.sjeng	176	2720
	176	2520
462.libquantum	176	63900
464.h264ref	176	4550
	176	4300
471.omnetpp	176	2120
	176	2010
473.astar	176	2150
483.xalancbmk	176	4340

SPECint_rate_base2006 = 3910

SPECint_rate2006 = 4110

Hardware

CPU Name: Intel Xeon Gold 6152

CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz

CPU MHz: 2100

FPU: Integrated

CPU(s) enabled: 88 cores, 4 chips, 22 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: 30.25 MB I+D on chip per chip

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

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

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Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	176	586	2930	**587**	**2930**	589	2920	176	485	3550	**484**	**3550**	484	3550
401.bzip2	176	955	1780	965	1760	**960**	**1770**	176	921	1840	908	1870	**913**	**1860**
403.gcc	176	498	2840	500	2830	**498**	**2840**	176	496	2860	498	2840	**496**	**2860**
429.mcf	176	308	5210	305	5260	**306**	**5250**	176	308	5210	305	5260	**306**	**5250**
445.gobmk	176	**784**	**2350**	784	2360	785	2350	176	**786**	**2350**	786	2350	786	2350
456.hmmer	176	306	5360	308	5340	**307**	**5340**	176	260	6320	**261**	**6300**	261	6280
458.sjeng	176	845	2520	844	2520	**845**	**2520**	176	784	2720	**784**	**2720**	780	2730
462.libquantum	176	**57.0**	**63900**	57.0	63900	57.0	64000	176	**57.0**	**63900**	57.0	63900	57.0	64000
464.h264ref	176	910	4280	898	4340	**906**	**4300**	176	863	4510	849	4590	**856**	**4550**
471.omnetpp	176	547	2010	**546**	**2010**	546	2020	176	519	2120	**519**	**2120**	519	2120
473.astar	176	576	2150	574	2150	**575**	**2150**	176	576	2150	574	2150	**575**	**2150**
483.xalancbmk	176	280	4340	**280**	**4340**	279	4350	176	280	4340	**280**	**4340**	279	4350

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=1-175
    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-apb2 Wed Oct 18 09:18:48 2017

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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 6152 CPU @ 2.10GHz
      4 "physical id"s (chips)
      176 "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 : 22
      siblings  : 44
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
   cache size : 30976 KB

From /proc/meminfo
   MemTotal:       791224268 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-apb2 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
   (9464f67) x86_64 x86_64 x86_64 GNU/Linux
```

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Platform Notes (Continued)

```
run-level 3 Oct 18 09:18

SPEC is set to: /home/cpu2006
   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:
  12x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666 MHz
  12x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666 MHz
  24x 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
 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_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
      401.bzip2: -D_FILE_OFFSET_BITS=64
```

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Base 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: -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
```

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
```

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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
       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
```

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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
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revD.20171221.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
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revD.20171221.xml

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

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