SPEC® CINT2006 Result

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Dell Inc.

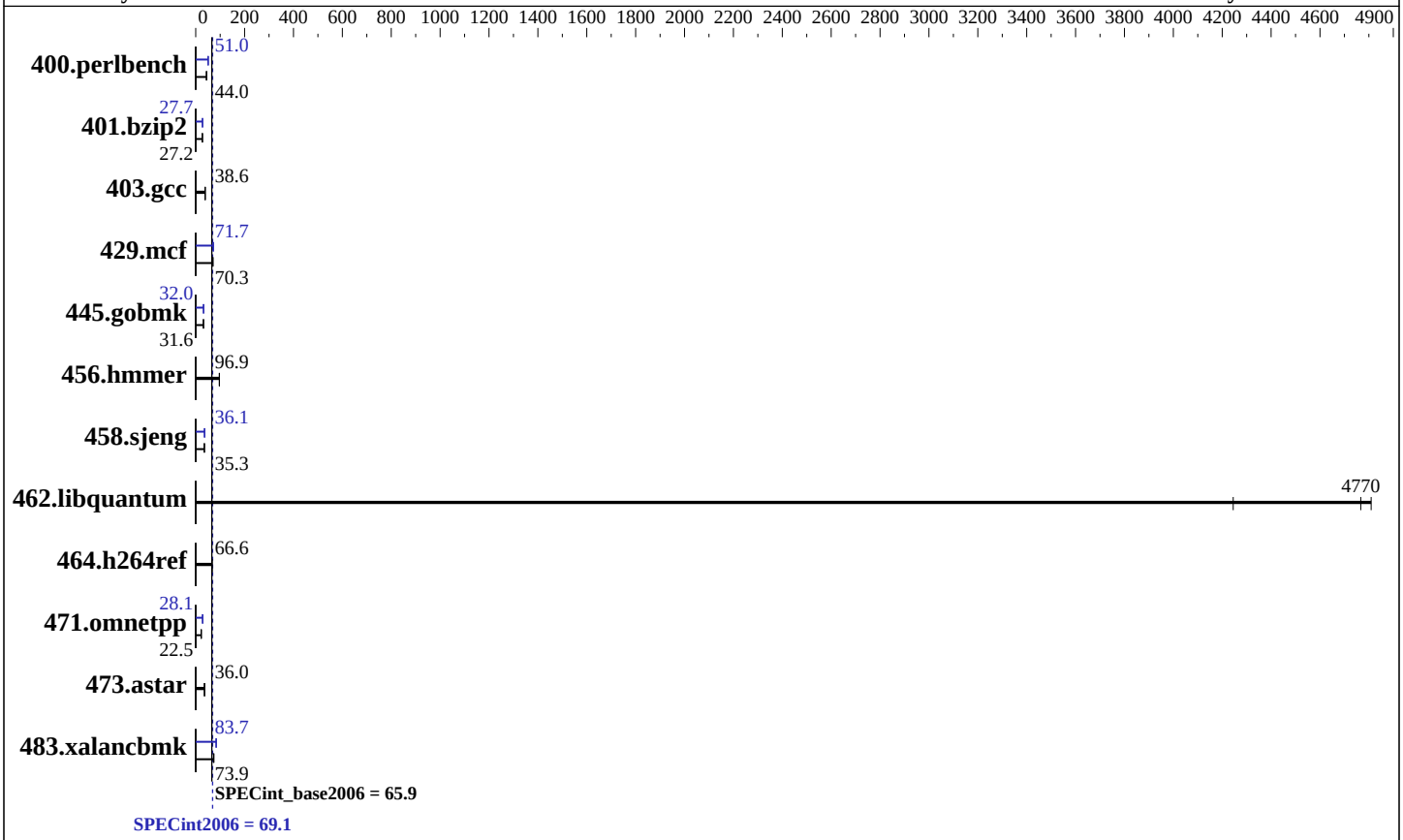
PowerEdge C6420 (Intel Xeon Gold 5122, 3.60 GHz)

SPECint®2006 = 69.1

SPECint_base2006 = 65.9

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

Test date: Feb-2017
Hardware Availability: Jul-2017
Software Availability: Jul-2017



Hardware

CPU Name:	Intel Xeon Gold 5122
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	3600
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:	1 MB I+D on chip per core
L3 Cache:	16.5 MB I+D on chip per chip
Other Cache:	None
Memory:	384 GB (12 x 32 GB 2Rx8 PC4-2666V-R)
Disk Subsystem:	1 x 960 GB SATA SSD
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 12 SP2 4.4.16-56-default
Compiler:	C/C++: Version 17.0.1.132 of Intel C/C++ Compiler for Linux
Auto Parallel:	Yes
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	220	44.3	**222**	**44.0**	222	44.0	**192**	**51.0**	192	50.9	192	51.0
401.bzip2	354	27.3	**354**	**27.2**	354	27.2	348	27.8	**348**	**27.7**	348	27.7
403.gcc	**209**	**38.6**	209	38.6	208	38.7	**209**	**38.6**	209	38.6	208	38.7
429.mcf	129	70.6	131	69.6	**130**	**70.3**	127	71.7	**127**	**71.7**	127	71.6
445.gobmk	332	31.6	332	31.6	**332**	**31.6**	328	32.0	328	32.0	**328**	**32.0**
456.hmmer	96.5	96.7	96.3	96.9	**96.3**	**96.9**	96.5	96.7	96.3	96.9	**96.3**	**96.9**
458.sjeng	342	35.3	343	35.3	**343**	**35.3**	335	36.1	**335**	**36.1**	336	36.1
462.libquantum	4.31	4810	4.88	4240	**4.35**	**4770**	4.31	4810	4.88	4240	**4.35**	**4770**
464.h264ref	**332**	**66.6**	332	66.6	333	66.5	**332**	**66.6**	332	66.6	333	66.5
471.omnetpp	**277**	**22.5**	273	22.9	280	22.4	222	28.2	222	28.1	**222**	**28.1**
473.astar	**195**	**36.0**	194	36.1	197	35.7	**195**	**36.0**	194	36.1	197	35.7
483.xalancbmk	92.9	74.3	95.2	72.5	**93.4**	**73.9**	82.4	83.8	82.5	83.6	**82.5**	**83.7**

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:
Sub NUMA Cluster disabled
Virtualization Technology disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to Autonomous
C1E disabled
Energy Efficient Turbo 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/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-mlw4 Wed Feb 15 11:06:08 2017

This section contains SUT (System Under Test) info as seen by
```

Continued on next page

Platform Notes (Continued)

```
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 5122 CPU @ 3.60GHz
      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 2 3 4 10
      physical 1: cores 1 5 9 13
   cache size : 16896 KB

From /proc/meminfo
   MemTotal:       394868184 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

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-mlw4 4.4.16-56-default #1 SMP Mon Aug 8 14:24:26 UTC 2016
   (5b281a8) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Feb 15 11:05

SPEC is set to: /root/cpu2006-1.2
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda3      xfs   929G   31G  898G   4% /
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
```

Continued on next page

Platform Notes (Continued)

```
      hardware, firmware, and the "DMTF SMBIOS" standard.

    BIOS Dell Inc. 0.4.1 02/07/2017
    Memory:
     4x 002C00B3002C 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666 MHz
     8x 00AD063200AD HMA84GR7AFR4N-VK 32 GB 2 rank 2666 MHz
     4x Not Specified Not Specified

   (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/root/cpu2006-1.2/lib/ia32:/root/cpu2006-1.2/lib/intel64:/root/cpu2006-1.2/sh10.2"
OMP_NUM_THREADS = "8"

 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.
```

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
  483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:
```
-xCORE-AVX512 -ipo -O3 -no-prec-div -parallel -qopt-prefetch
-auto-p32
```

C++ benchmarks:
```
-xCORE-AVX512 -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`
462.libquantum: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`
464.h264ref: `-DSPEC_CPU_LP64`
471.omnetpp: `-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-AVX512`(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-AVX512`(pass 2) `-par-num-threads=1`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div -auto-ilp32 -qopt-prefetch`

403.gcc: `basepeak = yes`

429.mcf: `-xCORE-AVX512 -ipo -O3 -no-prec-div -parallel -qopt-prefetch -auto-p32`

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)

456.hmmer: `basepeak = yes`

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`

462.libquantum: `basepeak = yes`

464.h264ref: `basepeak = yes`

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 -Wl,-z,muldefs -L/sh10.2 -lsmartheap`

473.astar: `basepeak = yes`

483.xalancbmk: `-xCORE-AVX512 -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
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revB.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-revB.xml

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