



SPEC® CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R940
(Intel Xeon Platinum 8164, 2.00 GHz)

SPECint®2006 = 80.0

SPECint_base2006 = 76.4

CPU2006 license: 55

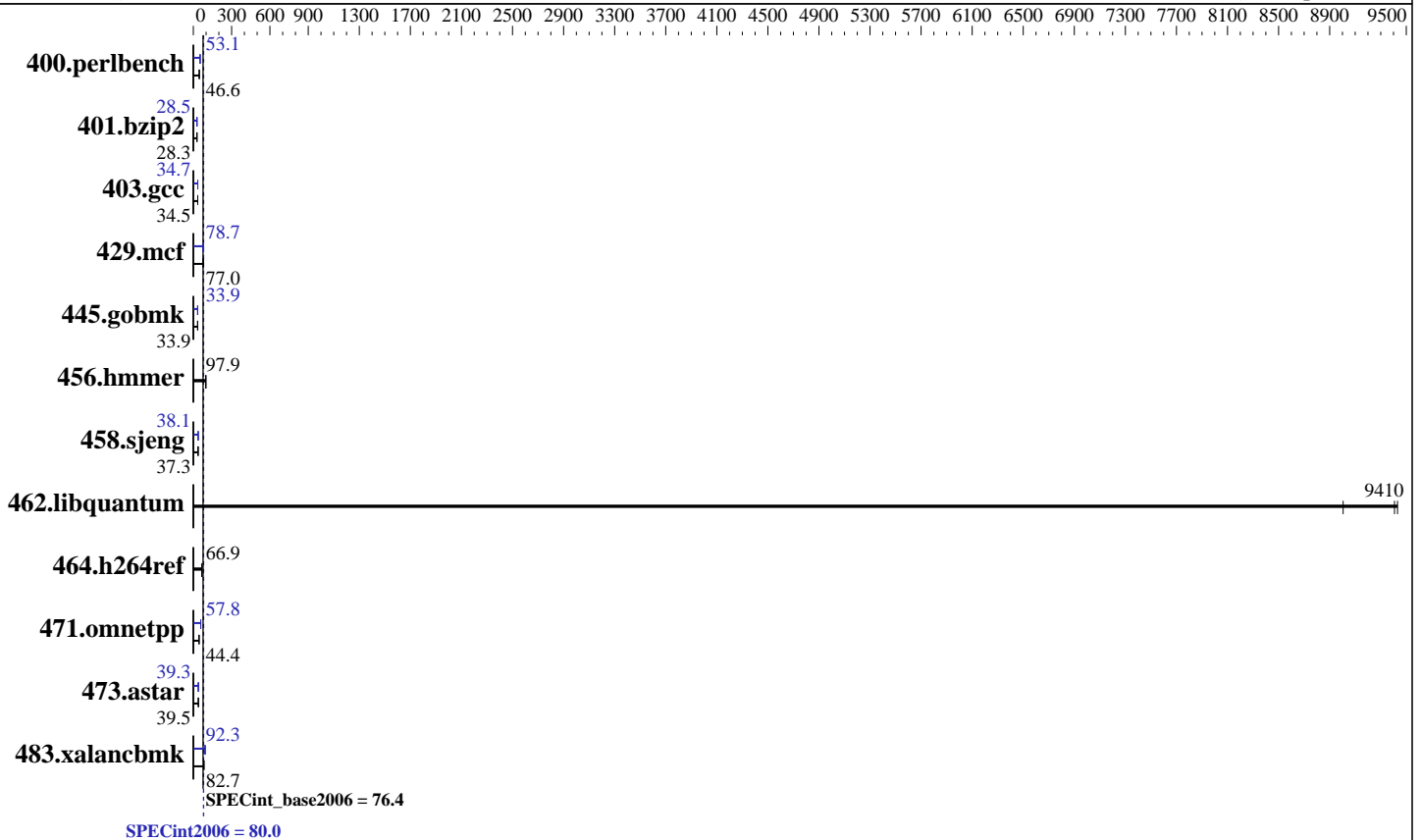
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Oct-2017

Hardware Availability: Jul-2017

Software Availability: Apr-2017



Hardware

CPU Name: Intel Xeon Platinum 8164
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
 CPU MHz: 2000
 FPU: Integrated
 CPU(s) enabled: 104 cores, 4 chips, 26 cores/chip
 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: 35.75 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: 32/64-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 | 209 | 46.7 | 210 | 46.5 | <u>209</u> | <u>46.6</u> | 184 | 53.0 | <u>184</u> | <u>53.1</u> | 183 | 53.4 |
| 401.bzip2 | <u>341</u> | <u>28.3</u> | 340 | 28.4 | 342 | 28.2 | 339 | 28.5 | <u>339</u> | <u>28.5</u> | 339 | 28.5 |
| 403.gcc | 233 | 34.5 | 233 | 34.6 | <u>233</u> | <u>34.5</u> | 233 | 34.6 | <u>232</u> | <u>34.7</u> | 231 | 34.9 |
| 429.mcf | 115 | 79.1 | <u>118</u> | <u>77.0</u> | 119 | 76.8 | 119 | 76.9 | <u>116</u> | <u>78.7</u> | 115 | 79.0 |
| 445.gobmk | <u>310</u> | <u>33.9</u> | 310 | 33.9 | 310 | 33.9 | 309 | 33.9 | <u>309</u> | <u>33.9</u> | 310 | 33.9 |
| 456.hammer | <u>95.3</u> | <u>97.9</u> | 95.4 | 97.8 | 95.3 | 97.9 | <u>95.3</u> | <u>97.9</u> | 95.4 | 97.8 | 95.3 | 97.9 |
| 458.sjeng | 324 | 37.3 | <u>324</u> | <u>37.3</u> | 325 | 37.2 | 318 | 38.0 | <u>318</u> | <u>38.1</u> | 318 | 38.1 |
| 462.libquantum | <u>2.20</u> | <u>9410</u> | 2.20 | 9430 | 2.30 | 9010 | <u>2.20</u> | <u>9410</u> | 2.20 | 9430 | 2.30 | 9010 |
| 464.h264ref | 330 | 67.1 | 333 | 66.4 | <u>331</u> | <u>66.9</u> | 330 | 67.1 | 333 | 66.4 | <u>331</u> | <u>66.9</u> |
| 471.omnetpp | 138 | 45.4 | 142 | 44.1 | <u>141</u> | <u>44.4</u> | <u>108</u> | <u>57.8</u> | 108 | 57.8 | 107 | 58.4 |
| 473.astar | 178 | 39.4 | <u>178</u> | <u>39.5</u> | 177 | 39.6 | 179 | 39.1 | <u>179</u> | <u>39.3</u> | 179 | 39.3 |
| 483.xalancbmk | 82.6 | 83.6 | 84.4 | 81.7 | <u>83.4</u> | <u>82.7</u> | 76.2 | 90.6 | <u>74.8</u> | <u>92.3</u> | 74.0 | 93.2 |

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-92x1 Fri Oct 13 02:33:08 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



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Platform Notes (Continued)

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

From /proc/cpuinfo

```

model name : Intel(R) Xeon(R) Platinum 8164 CPU @ 2.00GHz
 4 "physical id"s (chips)
 104 "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 : 26
  siblings  : 26
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
                26 27 28 29
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
                26 27 28 29
  physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
                26 27 28 29
  physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
                26 27 28 29
 cache size : 36608 KB

```

From /proc/meminfo

```

MemTotal:      791224416 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-92x1 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Oct 13 02:32

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Platform Notes (Continued)

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:
48x 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:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"
OMP_NUM_THREADS = "104"

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

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Base Portability Flags (Continued)

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-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

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Peak Portability Flags (Continued)

```

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-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

```

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Peak Optimization Flags (Continued)

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

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>
<http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.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-revC.xml>

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