# SPEC® CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Dell Inc.

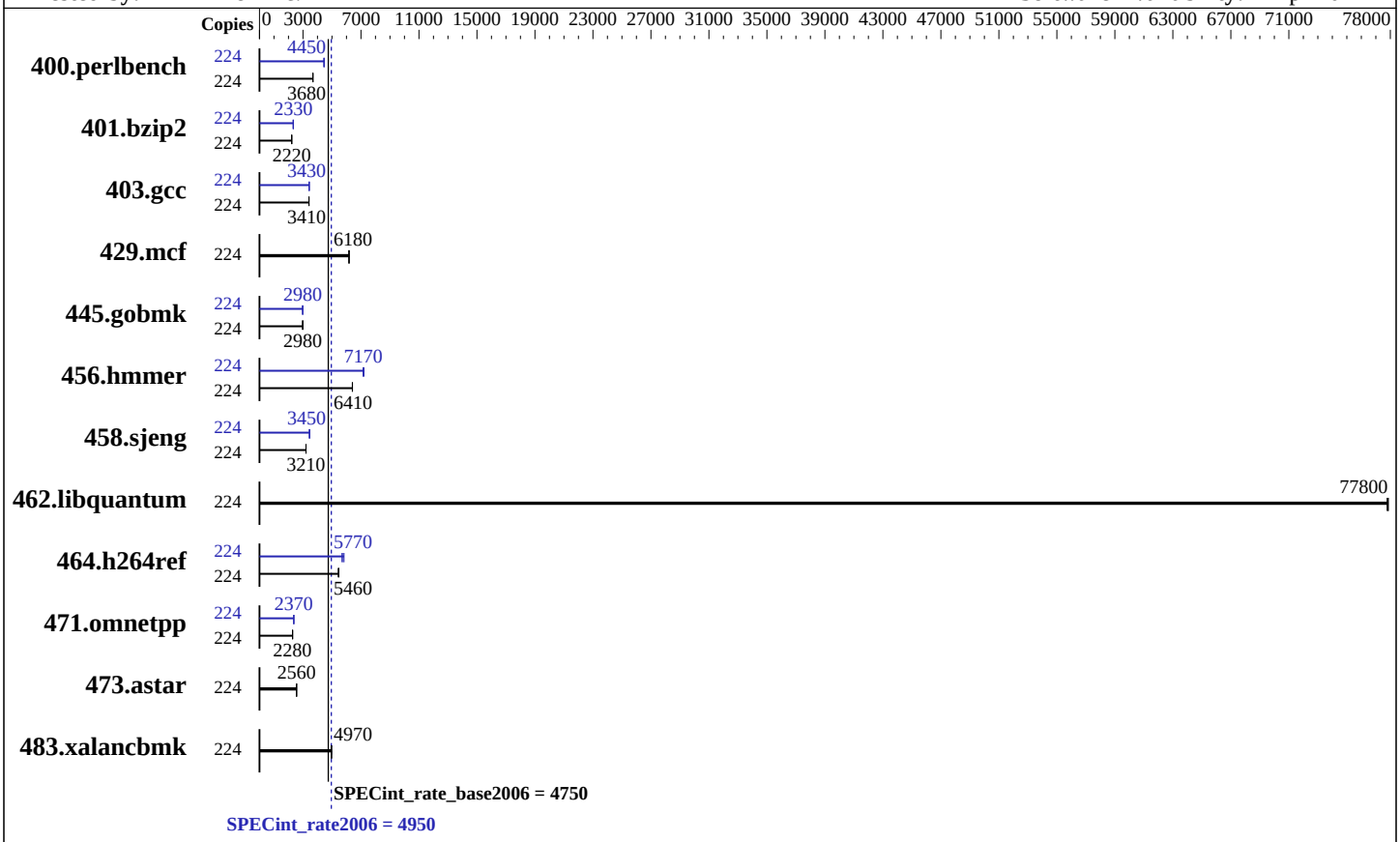
PowerEdge R940
(Intel Xeon Platinum 8176, 2.10 GHz)

SPECint®_rate2006 = 4950

SPECint_rate_base2006 = 4750

**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 8176 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.80 GHz |
| CPU MHz: | 2100 |
| FPU: | Integrated |
| CPU(s) enabled: | 112 cores, 4 chips, 28 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: | 38.5 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 |

# SPEC CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R940
(Intel Xeon Platinum 8176, 2.10 GHz)

SPECint_rate2006 = 4950

SPECint_rate_base2006 = 4750

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

**Test date:** Oct-2017
**Hardware Availability:** Jul-2017
**Software Availability:** Apr-2017

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 224 | 593 | 3690 | **594** | **3680** | 594 | 3680 | 224 | 490 | 4460 | **492** | **4450** | 492 | 4450 |
| 401.bzip2 | 224 | **972** | **2220** | 975 | 2220 | 970 | 2230 | 224 | 926 | 2330 | **927** | **2330** | 930 | 2330 |
| 403.gcc | 224 | 529 | 3410 | 528 | 3420 | **528** | **3410** | 224 | 527 | 3420 | 525 | 3430 | **526** | **3430** |
| 429.mcf | 224 | 332 | 6160 | 330 | 6190 | **331** | **6180** | 224 | 332 | 6160 | 330 | 6190 | **331** | **6180** |
| 445.gobmk | 224 | 788 | 2980 | 788 | 2980 | **788** | **2980** | 224 | 789 | 2980 | **788** | **2980** | 788 | 2980 |
| 456.hmmer | 224 | 326 | 6400 | **326** | **6410** | 326 | 6410 | 224 | 292 | 7150 | **292** | **7170** | 290 | 7210 |
| 458.sjeng | 224 | 844 | 3210 | **845** | **3210** | 846 | 3200 | 224 | 784 | 3460 | **786** | **3450** | 786 | 3450 |
| 462.libquantum | 224 | 59.7 | 77800 | 59.6 | 77900 | **59.6** | **77800** | 224 | 59.7 | 77800 | 59.6 | 77900 | **59.6** | **77800** |
| 464.h264ref | 224 | **908** | **5460** | 905 | 5480 | 913 | 5430 | 224 | 871 | 5690 | **860** | **5770** | 850 | 5830 |
| 471.omnetpp | 224 | **613** | **2280** | 614 | 2280 | 612 | 2290 | 224 | 592 | 2370 | 591 | 2370 | **591** | **2370** |
| 473.astar | 224 | 615 | 2560 | **614** | **2560** | 614 | 2560 | 224 | 615 | 2560 | **614** | **2560** | 614 | 2560 |
| 483.xalancbmk | 224 | 311 | 4970 | 312 | 4960 | **311** | **4970** | 224 | 311 | 4970 | 312 | 4960 | **311** | **4970** |

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=1-223
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 11 04:39:27 2017
```

Continued on next page

## 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) Platinum 8176 CPU @ 2.10GHz
      4 "physical id"s (chips)
      224 "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 : 28
      siblings  : 56
      physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
   cache size : 39424 KB

From /proc/meminfo
   MemTotal:       791224272 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
```

Continued on next page

## Platform Notes (Continued)

```
 run-level 3 Oct 11 04:39

 SPEC is set to: /home/cpu2006
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   796G  203G  594G  26% /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:
    17x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666 MHz
    7x 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`

Continued on next page

## 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

## 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

Continued on next page

## 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-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`


SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.


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

Tested with SPEC CPU2006 v1.2.
Report generated on Wed Nov 15 10:58:48 2017 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 14 November 2017.