# SPEC® CINT2006 Result
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## Dell Inc.

PowerEdge R630 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECint®_rate2006 =    395

SPECint_rate_base2006 =   375

**CPU2006 license:** 55

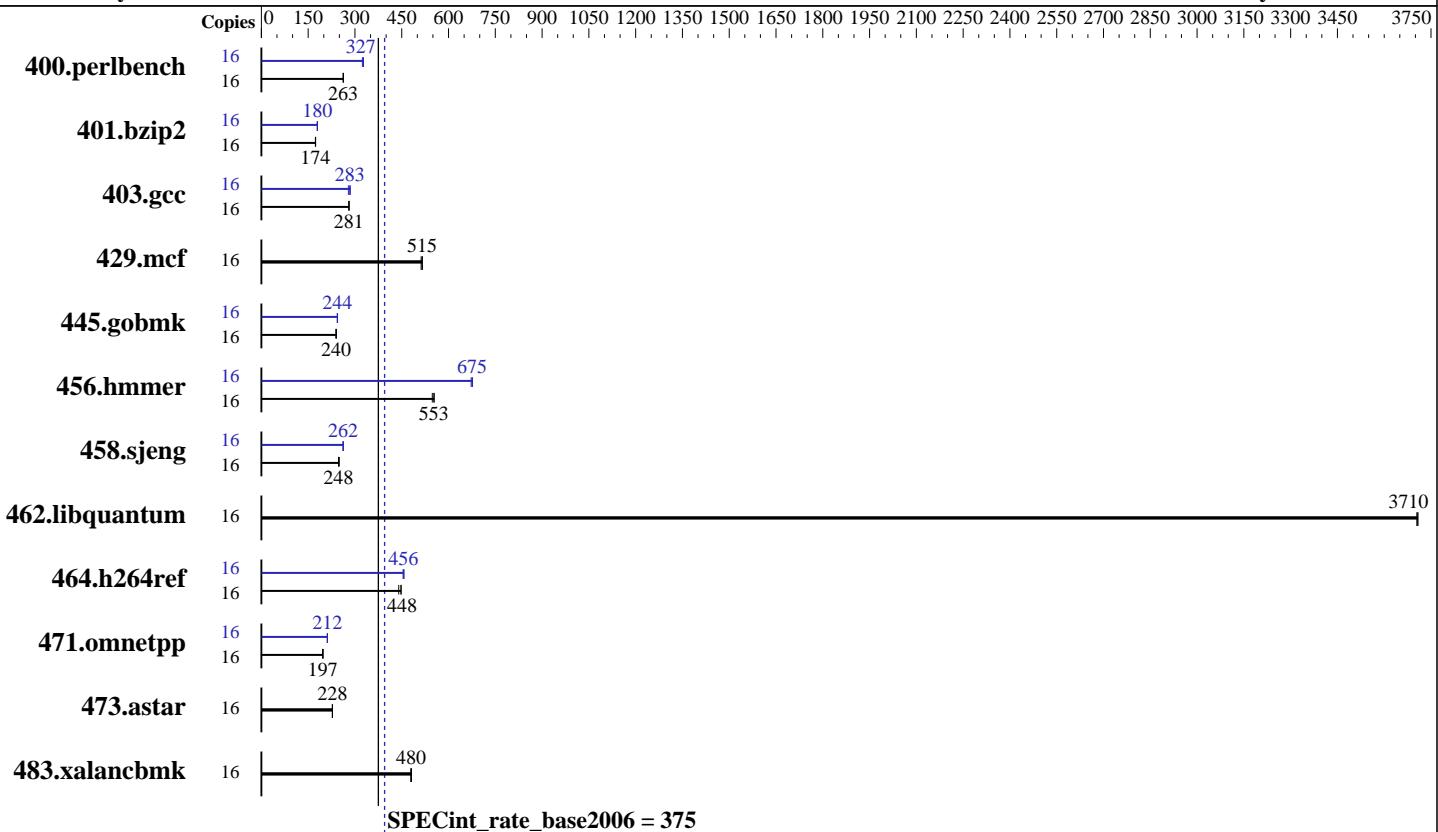**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test date:** Mar-2016

**Hardware Availability:** Mar-2016

**Software Availability:** Mar-2016

**Copies**

| Benchmark | | |
|---|---|---|
| 400.perlbench | 16 | 327 |
| | 16 | 263 |
| 401.bzip2 | 16 | 180 |
| | 16 | 174 |
| 403.gcc | 16 | 283 |
| | 16 | 281 |
| 429.mcf | 16 | 515 |
| 445.gobmk | 16 | 244 |
| | 16 | 240 |
| 456.hmmer | 16 | 675 |
| | 16 | 553 |
| 458.sjeng | 16 | 262 |
| | 16 | 248 |
| 462.libquantum | 16 | 3710 |
| 464.h264ref | 16 | 456 |
| | 16 | 448 |
| 471.omnetpp | 16 | 212 |
| | 16 | 197 |
| 473.astar | 16 | 228 |
| 483.xalancbmk | 16 | 480 |

SPECint_rate_base2006 = 375

SPECint_rate2006 = 395

## Hardware

**CPU Name:** Intel Xeon E5-2623 v4

**CPU Characteristics:** Intel Turbo Boost Technology up to 3.20 GHz

**CPU MHz:** 2600

**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:** 10 MB I+D on chip per chip

**Other Cache:** None

**Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)

**Disk Subsystem:** 1 x 120 GB SATA SSD

**Other Hardware:** None

## Software

**Operating System:** Red Hat Enterprise Linux Server release 7.1 (Maipo)
3.10.0-229.el7.x86_64

**Compiler:** C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux

**Auto Parallel:** No

**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 | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 16 | 594 | 263 | **595** | **263** | 596 | 262 | 16 | **478** | **327** | 483 | 324 | 478 | 327 |
| 401.bzip2 | 16 | **889** | **174** | 888 | 174 | 892 | 173 | 16 | 862 | 179 | **860** | **180** | 859 | 180 |
| 403.gcc | 16 | 458 | 281 | **459** | **281** | 459 | 281 | 16 | **455** | **283** | 452 | 285 | 462 | 279 |
| 429.mcf | 16 | 283 | 516 | **283** | **515** | 285 | 512 | 16 | 283 | 516 | **283** | **515** | 285 | 512 |
| 445.gobmk | 16 | **701** | **240** | 699 | 240 | 701 | 239 | 16 | 687 | 244 | **688** | **244** | 690 | 243 |
| 456.hmmer | 16 | **270** | **553** | 269 | 554 | 272 | 548 | 16 | 222 | 673 | **221** | **675** | 220 | 677 |
| 458.sjeng | 16 | 782 | 248 | 776 | 250 | **781** | **248** | 16 | 739 | 262 | 737 | 263 | **739** | **262** |
| 462.libquantum | 16 | 89.4 | 3710 | **89.5** | **3710** | 89.5 | 3700 | 16 | 89.4 | 3710 | **89.5** | **3710** | 89.5 | 3700 |
| 464.h264ref | 16 | **791** | **448** | 804 | 440 | 791 | 448 | 16 | 774 | 457 | **777** | **456** | 779 | 454 |
| 471.omnetpp | 16 | **508** | **197** | 506 | 197 | 508 | 197 | 16 | 472 | 212 | 473 | 211 | **473** | **212** |
| 473.astar | 16 | 494 | 228 | **493** | **228** | 493 | 228 | 16 | 494 | 228 | **493** | **228** | 493 | 228 |
| 483.xalancbmk | 16 | 229 | 481 | 230 | 479 | **230** | **480** | 16 | 229 | 481 | 230 | 479 | **230** | **480** |

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 Opportunistic Snoop Broadcast
        Virtualization Technology disabled
        System Profile set to Custom
        CPU Power Management set to Hardware P States
        Energy Efficient Turbo disabled
        C1E disabled
        C States set to Autonomous
        Memory Patrol Scrub disabled
        Energy Efficiency set to Balanced Performance
        Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
        $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
        running on localhost.localdomain Thu Mar 10 05:20:32 2016

        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

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# Platform Notes (Continued)

```
From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E5-2623 v4 @ 2.60GHz
      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 0 1 2 3
      physical 1: cores 0 1 2 3
   cache size : 10240 KB

From /proc/meminfo
   MemTotal:       528284164 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.1 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.1"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.1:ga:server

uname -a:
   Linux localhost.localdomain 3.10.0-229.el7.x86_64 #1 SMP Thu Jan 29 18:37:38
   EST 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 10 05:10

SPEC is set to: /root/cpu2006-1.2
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      xfs   102G  7.1G   95G   7% /
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. 2.0.1 02/12/2016
   Memory:
   16x 00CE00B300CE M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz, configured at 2133
```
Continued on next page

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## Platform Notes (Continued)

```
      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 i5-4670K CPU + 32GB
 memory using RedHat EL 7.1
 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
 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_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
```

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## 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 -Wl,-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
     429.mcf: -D_FILE_OFFSET_BITS=64
   445.gobmk: -D_FILE_OFFSET_BITS=64
   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_LINUX
  464.h264ref: -D_FILE_OFFSET_BITS=64
  471.omnetpp: -D_FILE_OFFSET_BITS=64
    473.astar: -D_FILE_OFFSET_BITS=64
```

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## Peak Portability Flags (Continued)

483.xalancbmk: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`

## Peak Optimization Flags

C benchmarks:

400.perlbench: `-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`

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## 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
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.xml

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