SPEC® CINT2006 Result
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Dell Inc.

PowerEdge R820 (Intel Xeon
E5-4603 v2, 2.20 GHz)

$SPECint^{®}2006 = $ 36.4

$SPECint_base2006 = $ 34.7

CPU2006 license: 55		**Test date:** Nov-2013
Test sponsor: Dell Inc.		**Hardware Availability:** Mar-2014
Tested by: Dell Inc.		**Software Availability:** Aug-2013

Benchmark results chart with scale 0 to 2000:
- 400.perlbench: 25.6 / 20.4
- 401.bzip2: 15.4 / 15.3
- 403.gcc: 20.8 / 20.5
- 429.mcf: 44.7
- 445.gobmk: 17.2 / 16.7
- 456.hmmer: 38.6 / 38.5
- 458.sjeng: 19.2 / 18.8
- 462.libquantum: 1960
- 464.h264ref: 37.2 / 33.8
- 471.omnetpp: 21.6 / 18.0
- 473.astar: 20.1
- 483.xalancbmk: 36.9 / 36.8

SPECint_base2006 = 34.7

SPECint2006 = 36.4

Hardware

CPU Name:	Intel Xeon E5-4603 v2
CPU Characteristics:	
CPU MHz:	2200
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 cores/chip
CPU(s) orderable:	2,4 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 (32 x 16 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem:	1 x 200 GB SAS SSD
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 11 (x86_64) 3.0.76-0.11-default
Compiler:	C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux
Auto Parallel:	Yes
File System:	ext2
System State:	Run level 3 (multi-user)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.0

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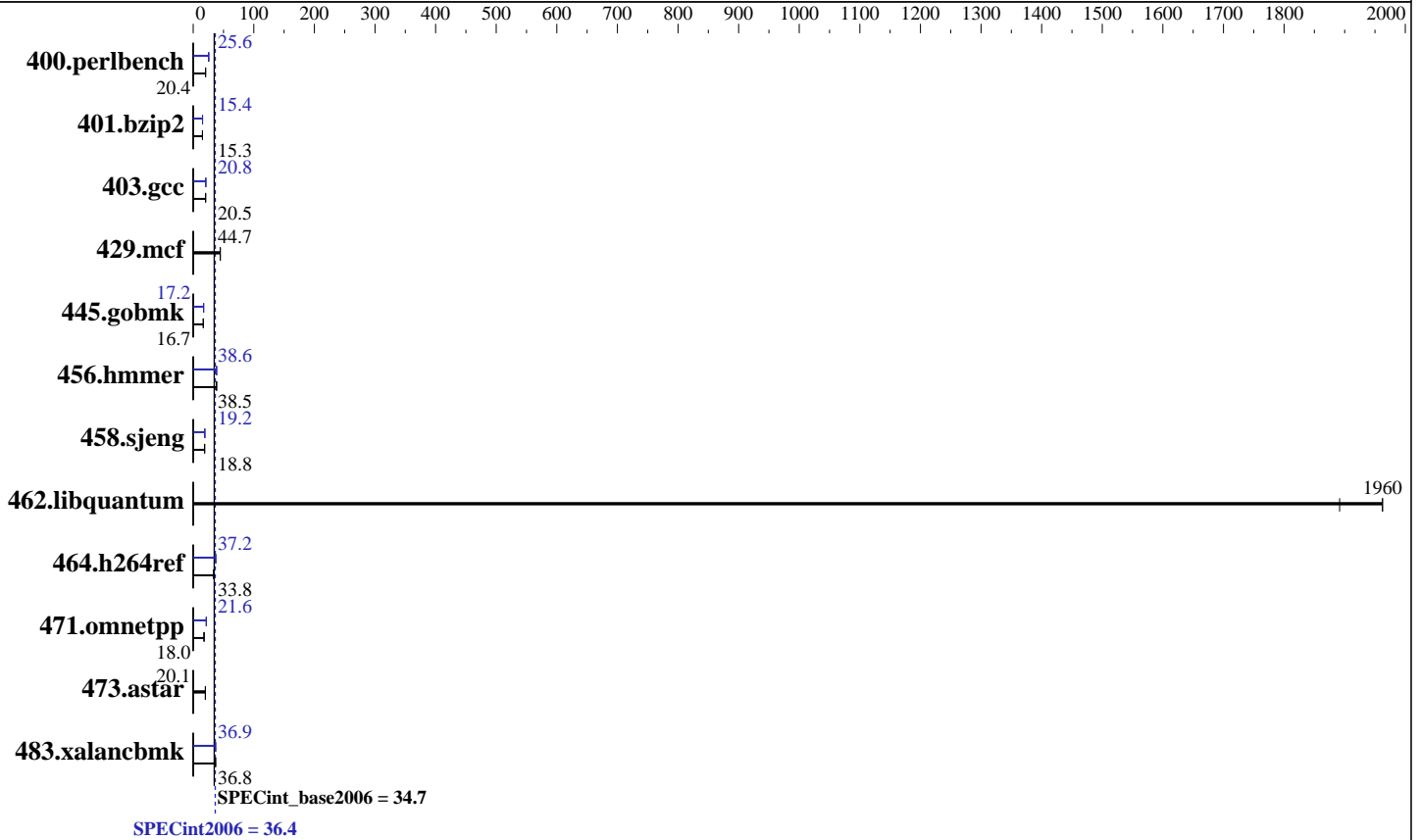
$SPECint_base2006 = $ 34.7

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	478	20.4	**478**	**20.4**	478	20.4	**382**	**25.6**	382	25.6	382	25.6
401.bzip2	**631**	**15.3**	630	15.3	631	15.3	625	15.4	625	15.4	**625**	**15.4**
403.gcc	393	20.5	395	20.4	**393**	**20.5**	387	20.8	387	20.8	**387**	**20.8**
429.mcf	204	44.6	204	44.7	**204**	**44.7**	204	44.6	204	44.7	**204**	**44.7**
445.gobmk	628	16.7	629	16.7	**628**	**16.7**	609	17.2	**610**	**17.2**	610	17.2
456.hmmer	243	38.4	**243**	**38.5**	241	38.7	242	38.5	**242**	**38.6**	242	38.6
458.sjeng	642	18.8	642	18.8	**642**	**18.8**	632	19.2	**631**	**19.2**	631	19.2
462.libquantum	**10.6**	**1960**	11.0	1890	10.6	1960	**10.6**	**1960**	11.0	1890	10.6	1960
464.h264ref	**655**	**33.8**	655	33.8	656	33.7	596	37.1	**595**	**37.2**	595	37.2
471.omnetpp	348	18.0	**348**	**18.0**	349	17.9	289	21.6	290	21.6	**289**	**21.6**
473.astar	349	20.1	349	20.1	**349**	**20.1**	349	20.1	349	20.1	**349**	**20.1**
483.xalancbmk	187	36.9	187	36.8	**187**	**36.8**	186	37.0	187	36.8	**187**	**36.9**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

```
    BIOS settings:
    Virtualization Technology disabled
    Execute Disable disabled
    Logical Processor disabled
    System Profile set to Performance
     Sysinfo program /root/cpu2006.1.2.ic13/config/sysinfo.rev6818
     $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
     running on linux Sun Nov  3 17:04:22 2013

     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) CPU E5-4603 v2 @ 2.20GHz
          4 "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  : 4
          physical 0: cores 0 1 2 3
```

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Platform Notes (Continued)

```
     physical 1: cores 0 1 2 3
     physical 2: cores 0 1 2 3
     physical 3: cores 0 1 2 3
   cache size : 10240 KB

 From /proc/meminfo
    MemTotal:       529392212 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /usr/bin/lsb_release -d
    SUSE Linux Enterprise Server 11 (x86_64)

 From /etc/*release* /etc/*version*
    SuSE-release:
       SUSE Linux Enterprise Server 11 (x86_64)
       VERSION = 11
       PATCHLEVEL = 3

 uname -a:
    Linux linux 3.0.76-0.11-default #1 SMP Fri Jun 14 08:21:43 UTC 2013 (ccab990)
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Nov 3 16:59 last=S

 SPEC is set to: /root/cpu2006.1.2.ic13
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda2       ext2  175G   12G  163G   7% /

 Additional information from dmidecode:
   BIOS Dell Inc. 2.0.17 10/01/2013
   Memory:
    32x 00AD00B300AD HMT42GR7AFR4C-RD 16 GB 1333 MHz

 (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.ic13/libs/32:/root/cpu2006.1.2.ic13/libs/64:/root/cpu2006.1.2.ic13/sh"
 OMP_NUM_THREADS = "16"

  Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
  memory using RedHat EL 6.4
  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>
```

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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:
      -xSSE4.2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32

C++ benchmarks:
      -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
      -Wl,-z,muldefs -L/sh -lsmartheap64

Base Other Flags

C benchmarks:

         403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
      icc -m64

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Peak Compiler Invocation (Continued)

400.perlbench: `icc -m32`

445.gobmk: `icc -m32`

464.h264ref: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m32`

473.astar: `icpc -m64`

Peak Portability Flags

400.perlbench: `-DSPEC_CPU_LINUX_IA32`
401.bzip2: `-DSPEC_CPU_LP64`
403.gcc: `-DSPEC_CPU_LP64`
429.mcf: `-DSPEC_CPU_LP64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`
473.astar: `-DSPEC_CPU_LP64`
483.xalancbmk: `-DSPEC_CPU_LINUX`

Peak Optimization Flags

C benchmarks:

400.perlbench: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2)
`-opt-prefetch -ansi-alias`

401.bzip2: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div -prof-use`(pass 2) `-auto-ilp32`
`-opt-prefetch -ansi-alias`

403.gcc: `-xSSE4.2 -ipo -O3 -no-prec-div -inline-calloc`
`-opt-malloc-options=3 -auto-ilp32`

429.mcf: `basepeak = yes`

445.gobmk: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-prof-use`(pass 2)
`-ansi-alias`

456.hmmer: `-xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`
`-ansi-alias`

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Peak Optimization Flags (Continued)

458.sjeng: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll4

462.libquantum: basepeak = yes

464.h264ref: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll2 -ansi-alias

C++ benchmarks:

471.omnetpp: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-ra-region-strategy=block   -ansi-alias
-Wl,-z,muldefs -L/sh -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
-Wl,-z,muldefs -L/sh -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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revC.xml

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 Thu Jul 24 23:10:42 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 22 April 2014.