# Dell Inc.

PowerEdge R420 (Intel Xeon E5-2403 v2, 1.80 GHz)

**SPECint_rate2006** = 185  
**SPECint_rate_base2006** = 179

**CPU2006 license:** 55  
**Test date:** Oct-2013  
**Test sponsor:** Dell Inc.  
**Hardware Availability:** Jan-2014  
**Tested by:** Dell Inc.  
**Software Availability:** Sep-2013

### Hardware
- **CPU Name:** Intel Xeon E5-2403 v2
- **CPU Characteristics:**
  - **CPU MHz:** 1800
  - **FPU:** Integrated
  - **CPU(s) enabled:** 8 cores, 2 chips, 4 cores/chip
  - **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:** 192 GB (12 x 16 GB 2Rx4 PC3L-12800R-11, ECC)
  - **Disk Subsystem:** 1 x 300 GB 15000 RPM SAS
  - **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:** No
- **File System:** ext2
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 32-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** Microquill SmartHeap V10.0

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<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Bytes</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>8</td>
<td>500</td>
<td>126</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>8</td>
<td>500</td>
<td>92.2</td>
</tr>
<tr>
<td>403.gcc</td>
<td>8</td>
<td>500</td>
<td>89.5</td>
</tr>
<tr>
<td>429.mcf</td>
<td>8</td>
<td>500</td>
<td>147</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>8</td>
<td>500</td>
<td>305</td>
</tr>
<tr>
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<td>8</td>
<td>500</td>
<td>245</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>8</td>
<td>500</td>
<td>112</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>8</td>
<td>500</td>
<td>109</td>
</tr>
<tr>
<td>473.astar</td>
<td>8</td>
<td>500</td>
<td>103</td>
</tr>
<tr>
<td>483.xalancbmk</td>
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<td>500</td>
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Poster 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, see the config file.

Operating System Notes

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

Platform Notes

BIOS settings:
Virtualization Technology disabled
Execute Disable disabled
Logical Processor enabled
System Profile set to Performance
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on linux Fri Oct 25 09:44:44 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 E5-2403 v2 @ 1.80GHz
  2 "physical id" s (chips)
  8 "processors"

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SPEC CINT2006 Result

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Platform Notes (Continued)
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
physical 1: cores 0 1 2 3
cache size : 10240 KB

From /proc/meminfo
MemTotal: 198410440 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 Oct 25 09:44 last=S

SPEC is set to: /root/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 ext2 267G 7.7G 258G 3% /

Additional information from dmidecode:
BIOS Dell Inc. 2.0.21 09/23/2013
Memory:
12x 00CE00B300CE M393B2G70BH0-YK0 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/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

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/redhat_transparent_hugepage(enabled
Filesystem page cache cleared with:
echo 1> /proc/sys/vm/drop_caches

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General Notes (Continued)

runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Base Compiler Invocation

C benchmarks:

```
icc  -m32
```

C++ benchmarks:

```
icpc -m32
```

Base Portability Flags

- 400.perlbench: -DSPEC\_CPU\_LINUX\_IA32
- 462.libquantum: -DSPEC\_CPU\_LINUX
- 483.xalancbmk: -DSPEC\_CPU\_LINUX

Base Optimization Flags

C benchmarks:

```
-xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xSSE4.2 -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
```

```
400.perlbench: icc  -m64
```

```
401.bzip2: icc  -m64
```

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**Peak Compiler Invocation (Continued)**

456.hmmer: `icc -m64`
458.sjeng: `icc -m64`

**C++ benchmarks:**
`icpc -m32`

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**Peak Portability Flags**

400.perlbench: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-DSPEC_CPU_LP64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LINUX`
483.xalancbmk: `-DSPEC_CPU_LINUX`

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**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) -auto-ilp32`
401.bzip2: `-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 -auto-ilp32 -ansi-alias`
403.gcc: `basepeak = yes`
429.mcf: `basepeak = yes`
445.gobmk: `-xSSE4.2(pass 2) -prof-gen(pass 1) -prof-use(pass 2) -ansi-alias -opt-mem-layout-trans=3`
456.hmmer: `-xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`
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 -auto-ilp32`
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`

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Peak Optimization Flags (Continued)

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)
-ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs
-L/sh -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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revB.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-revB.xml

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Originally published on 28 January 2014.