### Dell Inc.

**PowerEdge R420 (Intel Xeon E5-2450L, 1.80 GHz)**

| SPECint\_rate2006 = | 439 |
| SPECint\_rate\_base2006 = | 422 |

**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test date:** Mar-2012  
**Hardware Availability:** May-2012  
**Software Availability:** Feb-2012

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**CPU Name:** Intel Xeon E5-2450L  
**CPU Characteristics:** Intel Turbo Boost Technology up to 2.30 GHz  
**CPU MHz:** 1800  
**FPU:** Integrated  
**CPU(s) enabled:** 16 cores, 2 chips, 8 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:** 20 MB I+D on chip per chip  
**Other Cache:** None  
**Memory:** 48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
**Disk Subsystem:** 2 x 300 GB 15000 RPM SAS, RAID 1  
**Other Hardware:** None  

**Operating System:** SUSE Linux Enterprise Server 11 SP2 (x86_64) 3.0.13-0.9-default  
**Compiler:** C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux  
**Auto Parallel:** No  
**File System:** ext3  
**System State:** Run level 3 (add definition here)  
**Base Pointers:** 32-bit  
**Peak Pointers:** 32/64-bit  
**Other Software:** Microquill SmartHeap V9.01
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Benchmark | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
400.perlbench | 32 | 991 | 1004 | 311 | 1003 | 312 | 32 | 849 | 838 | 373 | 370 | 846 | 838 | 373 | 370 |
401.bzip2 | 32 | 1294 | 1311 | 236 | 1317 | 234 | 32 | 1275 | 1278 | 242 | 242 | 1275 | 1278 | 242 | 242 |
403.mcf | 32 | 759 | 761 | 338 | 758 | 340 | 32 | 760 | 763 | 338 | 757 | 757 | 340 | 757 | 757 |
429.mcf | 32 | 442 | 444 | 653 | 441 | 655 | 32 | 442 | 444 | 653 | 441 | 655 | 32 | 442 | 444 | 653 |
445.gobmk | 32 | 1068 | 1062 | 316 | 1065 | 315 | 32 | 1046 | 1044 | 322 | 322 | 1044 | 1044 | 322 | 322 |
456.hmmer | 32 | 563 | 564 | 529 | 562 | 531 | 32 | 470 | 474 | 630 | 474 | 630 | 32 | 470 | 474 | 630 |
458.sjeng | 32 | 1233 | 1231 | 315 | 1231 | 314 | 32 | 1177 | 1152 | 336 | 1179 | 328 | 32 | 1177 | 1152 | 336 |
462.libquantum | 32 | 261 | 2540 | 2540 | 261 | 2540 | 32 | 261 | 2540 | 2540 | 261 | 2540 | 32 | 261 | 2540 | 2540 |
464.h264ref | 32 | 1292 | 1290 | 549 | 1303 | 544 | 32 | 1277 | 1302 | 544 | 1278 | 554 | 32 | 1277 | 1302 | 544 |
471.omnetpp | 32 | 763 | 764 | 262 | 763 | 262 | 32 | 720 | 722 | 277 | 722 | 277 | 32 | 720 | 722 | 277 |
473.astar | 32 | 839 | 891 | 252 | 891 | 252 | 32 | 889 | 891 | 252 | 891 | 252 | 32 | 889 | 891 | 252 |
483.xalancbmk | 32 | 557 | 556 | 397 | 556 | 397 | 32 | 557 | 556 | 397 | 556 | 397 | 32 | 557 | 556 | 397 |

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
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost set to Enabled
C States/C1E set to Enabled
Sysinfo program /root/CPU2006-1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on Slik Wed Mar  7 10:33:24 2012

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 E5-2450L 0 @ 1.80GHz
  2 "physical id"s (chips)
  32 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The Continued on next page
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**SPEC CINT2006 Result**

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>439</th>
</tr>
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<tbody>
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### Platform Notes (Continued)

Following excerpts from `/proc/cpuinfo` might not be reliable. Use with caution.
- `cpu cores : 8`
- `siblings : 16`
- `physical 0: cores 0 1 2 3 4 5 6 7`
- `physical 1: cores 0 1 2 3 4 5 6 7`
- `cache size : 20480 KB`

From `/proc/meminfo`
- `MemTotal:     49381468 kB`
- `HugePages_Total:       0`
- `Hugepagesize:       2048 kB`

From `/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 = 2

- `uname -a:`
  - Linux Slik 3.0.13-0.9-default #1 SMP Mon Jan 16 17:33:03 UTC 2012 (54ddfaf)
  - x86_64 x86_64 x86_64 GNU/Linux

- `run-level 3 Mar 7 10:31 last=S`

SPEC is set to: `/root/CPU2006-1.2`
- Filesystem     Type  Size  Used Avail Use% Mounted on
  - `/dev/sda1      ext3  266G   11G  242G   5% /

Additional information from `dmidecode`:

(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"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RHEL5.5

Transparent Huge Pages enabled with:
- `echo always > /sys/kernel/mm/transparent_hugepage/enabled`
- `echo 1 > /proc/sys/vm/drop_caches`

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

The Dell PowerEdge R420 and the Bull NovaScale R430 F3 models are electronically equivalent.
General Notes (Continued)

The results have been measured on a Dell PowerEdge R420 model

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/smartheap -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
456.hmmer: icc  -m64

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Peak Compiler Invocation (Continued)

458.sjeng: icc -m64

C++ benchmarks:
icpc -m32

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

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: -xSSE4.2 -ipo -O3 -no-prec-div

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/smartheap -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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.xml

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

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