Fujitsu

PRIMERGY BX920 S4, Intel Xeon E5-2440 v2, 1.90 GHz

| SPECint\_rate\_2006 | 509 |
| SPECint\_rate\_base\_2006 | 490 |

CPU\_2006 license: 19
Test sponsor: Fujitsu
Tested by: Fujitsu

Test date: Dec-2013
Hardware Availability: Jan-2014
Software Availability: Sep-2013

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### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E5-2440 v2</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 2.40 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>1900</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>16 cores, 2 chips, 8 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>20 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>192 GB (12 x 16 GB 2Rx4 PC3L-12800R-11, ECC)</td>
</tr>
<tr>
<td>Disk Subsystem</td>
<td>1 x SATA, 500 GB, 7200 RPM</td>
</tr>
<tr>
<td>Other Hardware</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Red Hat Enterprise Linux Server release 6.4 (Santiago)</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>No</td>
</tr>
<tr>
<td>File System</td>
<td>ext4</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 5 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>32-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software</td>
<td>Microquill SmartHeap V10.0</td>
</tr>
</tbody>
</table>
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SPECint_rate2006 = 509
SPECint_rate_base2006 = 490

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>32</td>
<td>869</td>
<td>360</td>
<td>867</td>
<td>361</td>
<td>871</td>
<td>359</td>
<td>32</td>
<td>715</td>
<td>438</td>
<td>714</td>
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<tr>
<td>401.bzip2</td>
<td>32</td>
<td>1161</td>
<td>266</td>
<td>1159</td>
<td>266</td>
<td>1159</td>
<td>266</td>
<td>32</td>
<td>1136</td>
<td>272</td>
<td>1135</td>
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<tr>
<td>403.gcc</td>
<td>32</td>
<td>654</td>
<td>394</td>
<td>652</td>
<td>395</td>
<td>652</td>
<td>395</td>
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<td>654</td>
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<tr>
<td>429.mcf</td>
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<td>379</td>
<td>770</td>
<td>379</td>
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<td>379</td>
<td>770</td>
<td>32</td>
<td>715</td>
<td>438</td>
<td>714</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>32</td>
<td>949</td>
<td>354</td>
<td>952</td>
<td>353</td>
<td>952</td>
<td>353</td>
<td>32</td>
<td>932</td>
<td>360</td>
<td>906</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>32</td>
<td>455</td>
<td>656</td>
<td>457</td>
<td>654</td>
<td>457</td>
<td>654</td>
<td>32</td>
<td>416</td>
<td>718</td>
<td>413</td>
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<td>458.sjeng</td>
<td>32</td>
<td>1096</td>
<td>353</td>
<td>1095</td>
<td>354</td>
<td>1095</td>
<td>354</td>
<td>32</td>
<td>1050</td>
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<tr>
<td>462.libquantum</td>
<td>32</td>
<td>207</td>
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<td>3200</td>
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<td>3200</td>
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<td>3200</td>
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<tr>
<td>464.h264ref</td>
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<td>600</td>
<td>1179</td>
<td>601</td>
<td>1181</td>
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<td>1158</td>
<td>612</td>
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<tr>
<td>471.omnetpp</td>
<td>32</td>
<td>704</td>
<td>284</td>
<td>706</td>
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<td>704</td>
<td>284</td>
<td>32</td>
<td>665</td>
<td>301</td>
<td>669</td>
</tr>
<tr>
<td>473.astar</td>
<td>32</td>
<td>806</td>
<td>279</td>
<td>807</td>
<td>278</td>
<td>805</td>
<td>279</td>
<td>32</td>
<td>806</td>
<td>279</td>
<td>805</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>32</td>
<td>419</td>
<td>526</td>
<td>420</td>
<td>526</td>
<td>420</td>
<td>526</td>
<td>32</td>
<td>419</td>
<td>526</td>
<td>420</td>
</tr>
</tbody>
</table>

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 configuration:
Energy Performance = Performance

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/SPECcpu2006/libs/32:/SPECcpu2006/libs/64:/SPECcpu2006/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
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

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General Notes (Continued)

For information about Fujitsu please visit: http://www.fujitsu.com

Base Compiler Invocation

C benchmarks:

```bash
icc -m32
```

C++ benchmarks:

```bash
icpc -m32
```

Base Portability Flags

```bash
400.perlbench: -DSPEC_CPU_LINUX_IA32
462.libquantum: -DSPEC_CPU_LINUX
483.xalancbmk: -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:

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

C++ benchmarks:

```bash
-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:

```bash
403.gcc: -Dalloca=_alloca
```

Peak Compiler Invocation

C benchmarks (except as noted below):

```bash
icc -m32
```

400.perlbench: icc -m64

401.bzip2: icc -m64

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SPEC CINT2006 Result

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Peak Compiler Invocation (Continued)

456.hmmer: icc -m64
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)
-03(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)
-03(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 -03 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(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)
-03(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)
-03(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/Fujitsu-Platform.20131009.html
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Fujitsu-Platform.20131009.xml
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml

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

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