**HITACHI**

**Compute Blade 2000 (Intel Xeon E5-2670)**

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>HITACHI</td>
</tr>
<tr>
<td>Tested by:</td>
<td>HITACHI</td>
</tr>
<tr>
<td>Test date:</td>
<td>Jun-2012</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Aug-2012</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Feb-2012</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>SPECint_rate2006 = 646</th>
</tr>
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<tr>
<td>SPECint_rate_base2006 = 620</td>
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<tr>
<td>SPECint_rate_base2006 = 620</td>
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</table>

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon E5-2670</td>
<td></td>
</tr>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz</td>
<td></td>
</tr>
<tr>
<td>CPU MHZ: 2600</td>
<td></td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td></td>
</tr>
<tr>
<td>CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core</td>
<td></td>
</tr>
<tr>
<td>CPU(s) orderable: 1, 2 chips</td>
<td></td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td></td>
</tr>
<tr>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
<td></td>
</tr>
<tr>
<td>L3 Cache: 20 MB I+D on chip per chip</td>
<td></td>
</tr>
<tr>
<td>Other Cache: None</td>
<td></td>
</tr>
<tr>
<td>Memory: 128 GB (16 x 8 GB 2Rx4 PC3L-12800R-11, ECC)</td>
<td></td>
</tr>
<tr>
<td>Disk Subsystem: 2 x 300 GB SAS, 10000 RPM RAID1 configuration</td>
<td></td>
</tr>
<tr>
<td>Operating System: Red Hat Enterprise Linux Server release 6.2, Kernel 2.6.32-220.4.2.el6.x86_64</td>
<td></td>
</tr>
<tr>
<td>Compiler: C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux</td>
<td></td>
</tr>
<tr>
<td>Auto Parallel: No</td>
<td></td>
</tr>
<tr>
<td>File System: ext4</td>
<td></td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td></td>
</tr>
<tr>
<td>Base Pointers: 32-bit</td>
<td></td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td></td>
</tr>
<tr>
<td>Other Software: Microquill SmartHeap V9.01</td>
<td></td>
</tr>
</tbody>
</table>

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In the Specint Rate Test, the system achieved a SPECint rate of 646, which is higher than the SPECint rate_base of 620. The overall performance shows that the system is optimized for integer processing tasks.
HITACHI
Compute Blade 2000 (Intel Xeon E5-2670)

SPECint_rate2006 = 646
SPECint_rate_base2006 = 620

CPU2006 license: 35
Test sponsor: HITACHI
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</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>666</td>
<td>668</td>
<td>468</td>
<td>466</td>
<td>469</td>
<td></td>
</tr>
<tr>
<td>401.bzip2</td>
<td>32</td>
<td>900</td>
<td>899</td>
<td>344</td>
<td>899</td>
<td>344</td>
<td></td>
</tr>
<tr>
<td>403.gcc</td>
<td>32</td>
<td>517</td>
<td>515</td>
<td>501</td>
<td>518</td>
<td>498</td>
<td></td>
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<tr>
<td>429.mcf</td>
<td>32</td>
<td>307</td>
<td>307</td>
<td>949</td>
<td>308</td>
<td>949</td>
<td></td>
</tr>
<tr>
<td>445.gobmk</td>
<td>32</td>
<td>713</td>
<td>714</td>
<td>470</td>
<td>714</td>
<td>470</td>
<td></td>
</tr>
<tr>
<td>456.hmmer</td>
<td>32</td>
<td>378</td>
<td>378</td>
<td>792</td>
<td>377</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>458.sjeng</td>
<td>32</td>
<td>830</td>
<td>811</td>
<td>477</td>
<td>831</td>
<td>466</td>
<td></td>
</tr>
<tr>
<td>462.libquantum</td>
<td>32</td>
<td>178</td>
<td>178</td>
<td>3720</td>
<td>178</td>
<td>3720</td>
<td></td>
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<tr>
<td>464.h264ref</td>
<td>32</td>
<td>878</td>
<td>806</td>
<td>892</td>
<td>794</td>
<td>890</td>
<td>796</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>32</td>
<td>563</td>
<td>563</td>
<td>355</td>
<td>564</td>
<td>355</td>
<td></td>
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<tr>
<td>473.astar</td>
<td>32</td>
<td>620</td>
<td>620</td>
<td>362</td>
<td>620</td>
<td>362</td>
<td></td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>32</td>
<td>347</td>
<td>347</td>
<td>636</td>
<td>347</td>
<td>636</td>
<td></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 Settings:
Adjacent Cache Line Prefetch = Enabled

Sysinfo program /home/cpu2006/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on localhost.localdomain Fri Jun 15 04:07:29 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 E5-2670 0 @ 2.60GHz
  2 "physical id"s (chips)
  32 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with Continued on next page
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SPECint_rate_base2006 = 620

CPU2006 license: 35
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Platform Notes (Continued)

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: 132147320 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.2 (Santiago)

From /etc/*release* /etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6:server\n
uname -a:
Linux localhost.localdomain 2.6.32-220.4.2.el6.x86_64 #1 SMP Mon Feb 6
16:39:28 EST 2012 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 15 03:44

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/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/redhat_transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1>       /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
umactl --interleave=all runspec <etc>

HITACHI BladeSymphony BS2000 and HITACHI Compute Blade 2000 are electronically equivalent.
The results have been measured on a HITACHI BladeSymphony BS2000.

Base Compiler Invocation

C benchmarks:
  icc   -m32
HITACHI
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Base Compiler Invocation (Continued)

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
  458.sjeng: icc -m64
C++ benchmarks:
icpc -m32
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Compute Blade 2000 (Intel Xeon E5-2670)

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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

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

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

Continued on next page
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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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/PlatformHitachi-V1.2.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/PlatformHitachi-V1.2.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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