### Dell Inc.

**PowerEdge R640 (Intel Xeon Bronze 3104, 1.70 GHz)**

<table>
<thead>
<tr>
<th>SPECint Rate 2006</th>
<th>Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint Rate Base 2006</td>
<td>325</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test date:** Jul-2017  
**Hardware Availability:** Jul-2017  
**Software Availability:** Nov-2016

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Bronze 3104</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td></td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>1700</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>12 cores, 2 chips, 6 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chip</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>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>8.25 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2133 MT/s)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>SUSE Linux Enterprise Server 12 SP2 4.4.21-69-default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (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 V10.2</td>
</tr>
</tbody>
</table>
Dell Inc.
PowerEdge R640 (Intel Xeon Bronze 3104, 1.70 GHz)

SPECint_rate2006 = Not Run
SPECint_rate_base2006 = 325

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

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>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>Base</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>400.perlbench</td>
<td>12</td>
<td>492</td>
<td>238</td>
<td>492</td>
<td>238</td>
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<td></td>
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<tr>
<td>401.bzip2</td>
<td>12</td>
<td>827</td>
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<td>140</td>
<td>826</td>
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<td>403.gcc</td>
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<td>250</td>
<td>388</td>
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<td>429.mcf</td>
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<tr>
<td>445.gobmk</td>
<td>12</td>
<td>714</td>
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<td>715</td>
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<td>715</td>
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<td></td>
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<tr>
<td>456.hmmer</td>
<td>12</td>
<td>233</td>
<td>480</td>
<td>238</td>
<td>474</td>
<td>237</td>
<td>472</td>
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<td></td>
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<tr>
<td>458.sjeng</td>
<td>12</td>
<td>715</td>
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<tr>
<td>462.libquantum</td>
<td>12</td>
<td>78.7</td>
<td>3160</td>
<td>78.8</td>
<td>3150</td>
<td>78.9</td>
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<td>464.h264ref</td>
<td>12</td>
<td>654</td>
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<tr>
<td>471.omnetpp</td>
<td>12</td>
<td>409</td>
<td>183</td>
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<td>410</td>
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<tr>
<td>473.astar</td>
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<td>462</td>
<td>182</td>
<td>462</td>
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<tr>
<td>483.xalancbmk</td>
<td>12</td>
<td>180</td>
<td>460</td>
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<td>459</td>
<td>180</td>
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<tr>
<td>Peak</td>
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<td></td>
</tr>
</tbody>
</table>

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:
Virtualization Technology disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to autonomous
C1E disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /root/cpu2006-1.2_ic17u3/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-bo7a Sun Jul 2 12:40:20 2017

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
Continued on next page
Dell Inc.

PowerEdge R640 (Intel Xeon Bronze 3104, 1.70 GHz)

SPECint_rate2006 = Not Run

SPECint_rate_base2006 = 325

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Jul-2017
Hardware Availability: Jul-2017
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Platform Notes (Continued)

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Bronze 3104 CPU @ 1.70GHz
 2 "physical id"s (chips)
12 "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 : 6
siblings : 6
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5
cache size : 8448 KB

From /proc/meminfo
 MemTotal: 395511412 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
SuSE-release:
  NAME="SLES"
  VERSION="12-SP2"
  VERSION_ID="12.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
Linux linux-bo7a 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 2 12:17

SPEC is set to: /root/cpu2006-1.2_ic17u3
Filesystem  Type  Size  Used Avail Use% Mounted on
/dev/sda2  xfs  892G  27G  866G  3% /

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program
Continued on next page
Dell Inc.  
PowerEdge R640 (Intel Xeon Bronze 3104, 1.70 GHz)  

SPEC CINT2006 Result  

SPECint_rate2006 =  Not Run  
SPECint_rate_base2006 = 325

CPU2006 license: 55  
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Platform Notes (Continued)

reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Dell Inc. 1.0.5 06/19/2017
Memory: 24x 00AD00B300AD HMA82GR7A8R8N-VK 16 GB 2 rank 2666 MHz, configured at 2133 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_ic17u3/lib/ia32:/root/cpu2006-1.2_ic17u3/lib/intel64:/root/cpu2006-1.2_ic17u3/sh10.2"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2
Transparent Huge Pages enabled by default
Filesystem page cache cleared with: shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Base Compiler Invocation

C benchmarks:
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

C++ benchmarks:
icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

Base Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
401.bzip2: -D_FILE_OFFSET_BITS=64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
443.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
458.sjeng: -D_FILE_OFFSET_BITS=64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
Dell Inc. PowerEdge R640 (Intel Xeon Bronze 3104, 1.70 GHz) SPEC int_rate2006 = Not Run SPEC int_rate_base2006 = 325

CPU2006 license: 55 Test date: Jul-2017
Test sponsor: Dell Inc. Hardware Availability: Jul-2017
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Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap

Base 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-ic17.0-official-linux64-revF.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml

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

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