Dell Inc.

PowerEdge FC640 (Intel Xeon Gold 6148, 2.40 GHz)

SPECint<sup>®</sup>_rate2006 = 1990

SPECint<sub>rate</sub>_base2006 = 1900

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

<table>
<thead>
<tr>
<th>Test</th>
<th>SPECint&lt;sub&gt;rate&lt;/sub&gt;</th>
<th>SPECint&lt;sub&gt;rate&lt;/sub&gt;_base</th>
<th>CPU Name: Intel Xeon Gold 6148</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench</td>
<td>1440</td>
<td>894</td>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>bzip2</td>
<td>1380</td>
<td>860</td>
<td>CPU MHZ: 2400</td>
</tr>
<tr>
<td>gcc</td>
<td>2500</td>
<td>1380</td>
<td>FPU: Integrated</td>
</tr>
<tr>
<td>mcf</td>
<td>2640</td>
<td>1340</td>
<td>CPU(s) enabled: 40 cores, 2 chips, 20 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>gobmk</td>
<td></td>
<td>3110</td>
<td>CPU(s) orderable: 1,2 chip</td>
</tr>
<tr>
<td>hammer</td>
<td>2640</td>
<td>1340</td>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>sjeng</td>
<td>2500</td>
<td>1380</td>
<td>Secondary Cache: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>libquantum</td>
<td>2140</td>
<td>1170</td>
<td>L3 Cache: 27.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td>h264ref</td>
<td>1040</td>
<td>919</td>
<td>Other Cache: None</td>
</tr>
<tr>
<td>omnetpp</td>
<td>2640</td>
<td>969</td>
<td>Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)</td>
</tr>
<tr>
<td>astar</td>
<td>2500</td>
<td>1250</td>
<td>Disk Subsystem: 1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td>xalancbmk</td>
<td>2140</td>
<td>1170</td>
<td>Other Hardware: None</td>
</tr>
</tbody>
</table>

Operating System: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.16-56-default
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux
Auto Parallel: Yes
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.2
Dell Inc.

PowerEdge FC640 (Intel Xeon Gold 6148, 2.40 GHz)

CPU2006 license: 55
Test sponsor: Dell Inc.
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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>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>80</td>
<td>540</td>
<td>1450</td>
<td>541</td>
<td>1440</td>
<td>541</td>
<td>1440</td>
<td>80</td>
<td>446</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>80</td>
<td>898</td>
<td>1380</td>
<td>897</td>
<td>861</td>
<td>900</td>
<td>858</td>
<td>80</td>
<td>868</td>
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<tr>
<td>403.gcc</td>
<td>80</td>
<td>468</td>
<td>1380</td>
<td>467</td>
<td>1380</td>
<td>471</td>
<td>1370</td>
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<td>467</td>
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<td>429.mcf</td>
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<td>291</td>
<td>2500</td>
<td>292</td>
<td>2500</td>
<td>292</td>
<td>2500</td>
<td>80</td>
<td>291</td>
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<tr>
<td>445.gobmk</td>
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<td>720</td>
<td>1170</td>
<td>719</td>
<td>1170</td>
<td>720</td>
<td>1170</td>
<td>80</td>
<td>720</td>
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<tr>
<td>456.hmmer</td>
<td>80</td>
<td>283</td>
<td>2640</td>
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<td>2620</td>
<td>283</td>
<td>2640</td>
<td>80</td>
<td>240</td>
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<tr>
<td>458.sjeng</td>
<td>80</td>
<td>778</td>
<td>1240</td>
<td>777</td>
<td>1250</td>
<td>777</td>
<td>1250</td>
<td>80</td>
<td>722</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>80</td>
<td>53.1</td>
<td>31200</td>
<td>53.1</td>
<td>31200</td>
<td>53.0</td>
<td>31300</td>
<td>80</td>
<td>53.1</td>
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<tr>
<td>464.h264ref</td>
<td>80</td>
<td>828</td>
<td>2140</td>
<td>831</td>
<td>2130</td>
<td>825</td>
<td>2150</td>
<td>80</td>
<td>796</td>
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<tr>
<td>471.omnetpp</td>
<td>80</td>
<td>544</td>
<td>919</td>
<td>544</td>
<td>918</td>
<td>543</td>
<td>920</td>
<td>80</td>
<td>516</td>
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<tr>
<td>473.astar</td>
<td>80</td>
<td>541</td>
<td>1040</td>
<td>541</td>
<td>1040</td>
<td>538</td>
<td>1040</td>
<td>80</td>
<td>541</td>
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<tr>
<td>483.xalancbmk</td>
<td>80</td>
<td>263</td>
<td>2100</td>
<td>263</td>
<td>2100</td>
<td>263</td>
<td>2100</td>
<td>80</td>
<td>263</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:
Sub NUMA Cluster enabled
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
Logical Processor enabled
PCI 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-u8yg Mon Sep 4 02:44:39 2017

Continued on next page
SPEC CINT2006 Result

Dell Inc.

PowerEdge FC640 (Intel Xeon Gold 6148, 2.40 GHz)

SPECint_rate2006 = 1990
SPECint_rate_base2006 = 1900

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

Test date: Sep-2017
Hardware Availability: Sep-2017
Software Availability: Nov-2016

Platform Notes (Continued)

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) Gold 6148 CPU @ 2.40GHz
2 "physical id"s (chips)
80 "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 : 20
siblings : 40
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
cache size : 28160 KB

From /proc/meminfo
MemTotal: 196687100 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.
os-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-u8yg 4.4.16-56-default #1 SMP Mon Aug 8 14:24:26 UTC 2016
(5b281a8) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Sep 4 02:44

SPEC is set to: /root/cpu2006-1.2_ic17u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda1 btrfs 921G 17G 902G 2% /

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
Continued on next page
SPEC CINT2006 Result

Dell Inc.

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Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to
hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Dell Inc. 1.0.0 08/10/2017
Memory:
12x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666 MHz
4x Not Specified Not Specified

(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
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -D_FILE_OFFSET_BITS=64
458.sjeng: -D_FILE_OFFSET_BITS=64
464.h264ref: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
 SPEC CINT2006 Result

Dell Inc.
PowerEdge FC640 (Intel Xeon Gold 6148, 2.40 GHz)

SPECint_rate2006 = 1990
SPECint_rate_base2006 = 1900

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

Base Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX512 -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

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
400.perlbench: icc -m64
401.bzip2: icc -m64
456.hmmer: icc -m64
458.sjeng: icc -m64

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

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
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

Continued on next page
**Peak Portability Flags (Continued)**

483.xalancbmk: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`

**Peak Optimization Flags**

C benchmarks:

- `400.perlbmk`: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -auto-ilp32 -qopt-mem-layout-trans=3`
- `401.bzip2`: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -qopt-prefetch -auto-ilp32 -qopt-mem-layout-trans=3`
- `403.gcc`: `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3`
- `429.mcf`: `basepeak = yes`
- `445.gobmk`: `basepeak = yes`
- `458.sjeng`: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll4 -auto-ilp32 -qopt-mem-layout-trans=3`
- `462.libquantum`: `basepeak = yes`
- `464.h264ref`: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll2 -qopt-mem-layout-trans=3`

C++ benchmarks:

- `471.omnetpp`: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -qopt-ra-region-strategy=block -qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap`
- `473.astar`: `basepeak = yes`
Dell Inc.
PowerEdge FC640 (Intel Xeon Gold 6148, 2.40 GHz)

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<th>SPECint_rate2006 =</th>
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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-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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