Dell Inc. PowerEdge R940 (Intel Xeon Gold 5115, 2.40 GHz)  

**SPECint\_rate2006 = 1940**  
**SPECint\_rate\_base2006 = 1840**

<table>
<thead>
<tr>
<th>Test sponsor:</th>
<th>Dell Inc.</th>
<th>Test date:</th>
<th>Jun-2017</th>
</tr>
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<tbody>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
<td>Hardware Availability:</td>
<td>Jul-2017</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Software Availability:</td>
<td>Nov-2016</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Name</th>
<th>Intel Xeon Gold 5115</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.20 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2400</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>40 cores, 4 chips, 10 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>2,4 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>13.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>768 GB (48 x 16 GB 2Rx8 PC4-2666V-R, running at 2400 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>Yes</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>
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</table>
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>80</td>
<td>573</td>
<td>1.360</td>
<td>572</td>
<td>1.370</td>
<td>571</td>
<td>1.370</td>
<td>80</td>
<td>459</td>
<td>1.700</td>
<td>1.700</td>
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<tr>
<td>401.bzip2</td>
<td>80</td>
<td>966</td>
<td>0.799</td>
<td>965</td>
<td>0.800</td>
<td>957</td>
<td>0.807</td>
<td>80</td>
<td>916</td>
<td>0.843</td>
<td>0.841</td>
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<tr>
<td>403.gcc</td>
<td>80</td>
<td>488</td>
<td>1.320</td>
<td>477</td>
<td>1.350</td>
<td>477</td>
<td>1.350</td>
<td>80</td>
<td>475</td>
<td>1.360</td>
<td>1.350</td>
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<tr>
<td>429.mcf</td>
<td>80</td>
<td>295</td>
<td>2.470</td>
<td>297</td>
<td>2.450</td>
<td>297</td>
<td>2.460</td>
<td>80</td>
<td>295</td>
<td>2.470</td>
<td>2.450</td>
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<tr>
<td>445.gobmk</td>
<td>80</td>
<td>786</td>
<td>1.070</td>
<td>787</td>
<td>1.070</td>
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<td>786</td>
<td>1.070</td>
<td>1.070</td>
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<tr>
<td>456.hmmer</td>
<td>80</td>
<td>287</td>
<td>2.600</td>
<td>288</td>
<td>2.600</td>
<td>285</td>
<td>2.620</td>
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<td>236</td>
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<td>3.170</td>
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<td>458.sjeng</td>
<td>80</td>
<td>844</td>
<td>1.150</td>
<td>844</td>
<td>1.150</td>
<td>844</td>
<td>1.150</td>
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<td>784</td>
<td>1.240</td>
<td>1.230</td>
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<tr>
<td>462.libquantum</td>
<td>80</td>
<td>55.1</td>
<td>0.552</td>
<td>55.2</td>
<td>0.31000</td>
<td>55.5</td>
<td>29000</td>
<td>80</td>
<td>55.1</td>
<td>0.31000</td>
<td>0.31000</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>80</td>
<td>914</td>
<td>1.940</td>
<td>913</td>
<td>1.940</td>
<td>907</td>
<td>1.950</td>
<td>80</td>
<td>876</td>
<td>2.020</td>
<td>2.040</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>80</td>
<td>514</td>
<td>0.973</td>
<td>519</td>
<td>0.964</td>
<td>521</td>
<td>0.959</td>
<td>80</td>
<td>485</td>
<td>1.030</td>
<td>1.020</td>
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<tr>
<td>473.astar</td>
<td>80</td>
<td>532</td>
<td>1.060</td>
<td>539</td>
<td>1.040</td>
<td>544</td>
<td>1.030</td>
<td>80</td>
<td>532</td>
<td>1.060</td>
<td>1.040</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>80</td>
<td>251</td>
<td>2.200</td>
<td>255</td>
<td>2.160</td>
<td>257</td>
<td>2.150</td>
<td>80</td>
<td>251</td>
<td>2.200</td>
<td>2.160</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:
- 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
- CPU Interconnect Bus Link Power Management disabled
- PCI ASPM L1 Link Power Management disabled
- Sysinfo program /home/cpu2006-1.2_ic17u3/config/sysinfo.rev6993
- Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f8696cbe290c1)
- running on linux-b14r Wed Jun 7 21:03:00 2017

This section contains SUT (System Under Test) info as seen by

Continued on next page
Dell Inc.  PowerEdge R940 (Intel Xeon Gold 5115, 2.40 GHz)

SPECint_rate2006 = 1940
SPECint_rate_base2006 = 1840

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

Platform Notes (Continued)

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 5115 CPU @ 2.40GHz
4 "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
cautions.)
cpu cores : 10
siblings : 20
  physical 0: cores 0 1 2 3 4 8 9 10 11 12
  physical 1: cores 0 1 2 3 4 8 9 10 11 12
  physical 2: cores 0 1 2 3 4 8 9 10 11 12
  physical 3: cores 0 1 2 3 4 8 9 10 11 12
  cache size : 14080 KB

From /proc/meminfo
  MemTotal:       791969024 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:
  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-b14r 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 Jun 7 21:02

SPEC is set to: /home/cpu2006-1.2_ic17u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 852G 25G 827G 3% /home
Continued on next page
Dell Inc.

PowerEdge R940 (Intel Xeon Gold 5115, 2.40 GHz)

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<thead>
<tr>
<th>SPECint_rate2006</th>
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<tr>
<td>SPECint_rate_base2006</td>
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</table>

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

Test date: Jun-2017
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Platform Notes (Continued)

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

BIOS Dell Inc. 1.0.3 05/30/2017
Memory:
48x 00CE063200CE M393A2K43BB1-CTD 16 GB 2 rank 2666 MHz, configured at 2400 MHz

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2006-1.2_ic17u3/lib/ia32:/home/cpu2006-1.2_ic17u3/lib/intel64:/home/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
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSET_BITS=64

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SPEC CINT2006 Result

Dell Inc.
PowerEdge R940 (Intel Xeon Gold 5115, 2.40 GHz)

SPECint_rate2006 = 1940
SPECint_rate_base2006 = 1840

CPU2006 license: 55
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Base Portability Flags (Continued)
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

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

Continued on next page
Dell Inc.

PowerEdge R940 (Intel Xeon Gold 5115, 2.40 GHz)

SPECint_rate2006 = 1940
SPECint_rate_base2006 = 1840

CPU2006 license: 55
Test sponsor: Dell Inc.
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Peak Portability Flags (Continued)

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
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -03(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) -03(pass 2)
-no-prec-div(pass 2) -qopt-prefetch -auto-ilp32
-qopt-mem-layout-trans=3

403.gcc: -xCORE-AVX512 -ipo -03 -no-prec-div
-qopt-mem-layout-trans=3

429.mcf: basepeak = yes
445.gobmk: basepeak = yes
456.hmmer: -xCORE-AVX512 -ipo -03 -no-prec-div -unroll2 -auto-ilp32
-qopt-mem-layout-trans=3

458.sjeng: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -03(pass 2)
-no-prec-div(pass 2) -unroll14 -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) -03(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) -03(pass 2)
-no-prec-div(pass 2)

Continued on next page
## SPEC CINT2006 Result

**Dell Inc.**

PowerEdge R940 (Intel Xeon Gold 5115, 2.40 GHz)

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

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<tr>
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</tr>
<tr>
<td>Software Availability</td>
<td>Nov-2016</td>
</tr>
</tbody>
</table>

### Peak Optimization Flags (Continued)

- `471.omnetpp (continued)`
  - `-qopt-ra-region-strategy=block`
  - `-qopt-mem-layout-trans=3 -Wl,-z,muldefs`
  - `-L/sh10.2 -lsmartheap`

- `473.astar`: `basepeak = yes`

- `483.xalancbmk`: `basepeak = yes`

### Peak Other Flags

**C benchmarks:**

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

You can also download the XML flags sources by saving the following links:


---

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

Tested with SPEC CPU2006 v1.2.  