Dell Inc.

PowerEdge R730 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECint\_rate2006 = 395
SPECint\_rate\_base2006 = 375

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

Test date: Jul-2016
Hardware Availability: Jun-2016
Software Availability: Mar-2016

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Specint_rate2006</th>
<th>Specint_rate_base2006</th>
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<td>bzip2</td>
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<td>astar</td>
<td>16</td>
<td>229</td>
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</tr>
<tr>
<td>xalancbmk</td>
<td>16</td>
<td>485</td>
<td></td>
</tr>
</tbody>
</table>

SPECint\_rate\_base2006 = 375

CPU Name: Intel Xeon E5-2623 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2600

FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core
CPU(s) orderable: 1.2 chip
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 10 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx8 PC4-2400T-R, running at 2133 MHz)

Disk Subsystem: 200 GB SATA SSD
Other Hardware: None

Operating System: Red Hat Enterprise Linux Server release 7.2 (Maipo) 3.10.0-327.el7.x86_64
Compiler: C/C++: Version 16.0.2.181 of Intel C++ Studio XE for Linux
Auto Parallel: No
File System: xfs
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 R730 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECint_rate2006 = 395
SPECint_rate_base2006 = 375

CPU2006 license: 55
Test sponsor: Dell Inc.
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Results Table

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<td>228</td>
<td>484</td>
<td></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:
Snoop Mode set to Cluster on Die
Virtualization Technology disabled
System Profile set to custom
CPU Performance set to Hardware P States
C States set to Autonomous
C1E disabled
Energy Efficient Turbo disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Balanced Performance
Memory Patrol Scrub disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Thu Jul 28 09:46:59 2016

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 R730 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECint_rate2006 = 395
SPECint_rate_base2006 = 375

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

Test date: Jul-2016
Hardware Availability: Jun-2016
Software Availability: Mar-2016

Platform Notes (Continued)

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

From /proc/cpuinfo
   model name: Intel(R) Xeon(R) CPU E5-2623 v4 @ 2.60GHz
   2 "physical id"s (chips)
  16 "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: 4
    siblings: 8
    physical 0: cores 0 1 2 3
    physical 1: cores 0 1 2 3
   cache size: 10240 KB

From /proc/meminfo
   MemTotal: 264040560 kB
   HugePages_Total: 0
   Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.2 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.2"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)

   uname -a:
      Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29
      EDT 2015 x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 Jul 28 09:43

   SPEC is set to: /root/cpu2006-1.2

   Filesystem  Type Size Used Avail Use% Mounted on
   /dev/sda2 xfs 179G 8.2G 171G 5% /

   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. 2.1.7 06/16/2016
   Memory:
## Dell Inc.

**PowerEdge R730 (Intel Xeon E5-2623 v4, 2.60 GHz)**

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>395</th>
</tr>
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<td>SPECint_rate_base2006</td>
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**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test date:** Jul-2016  
**Hardware Availability:** Jun-2016  
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### Platform Notes (Continued)

15x 00AD063200AD HMA82GR7MF8N-UH 16 GB 2 rank 2400 MHz, configured at 2133 MHz  
1x 00CE00B300CE M393A2K43BB1-CRC 16 GB 2 rank 2400 MHz, configured at 2133 MHz  
8x 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/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
```

The Dell PowerEdge R730 and the PowerEdge R730xd models are electronically equivalent. The results have been measured on a Dell PowerEdge R730xd model. Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB memory using RedHat EL 7.2 glibc 2.17

Transparent Huge Pages enabled with:
```
echo always > /sys/kernel/mm/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>
```

### Base Compiler Invocation

**C benchmarks:**
```
icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin```

**C++ benchmarks:**
```
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin```

### Base Portability Flags

- **400.perlbench:** `-D_FILE OFFSET_BITS=64 -DSPEC\_CPU\_LINUX\_IA32`
- **401.zip:** `-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`
- **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 R730 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECint_rate2006 = 395
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CPU2006 license: 55
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Base Optimization Flags

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

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3 -W1,-z,muldefs -L/sh -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_2016/linux/compiler/lib/ia32_lin
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_2016/linux/compiler/lib/ia32_lin

Peak Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -D_FILE_OFFSET_BITS=64 -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: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
464.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
SPEC CINT2006 Result

Dell Inc.  
PowerEdge R730 (Intel Xeon E5-2623 v4, 2.60 GHz)

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Software Availability: Mar-2016

Peak Portability Flags (Continued)

483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch  
-auto-ilp32 -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

429.mcf: basepeak = yes

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias  
-opt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4  
-auto-ilp32

462.libquantum: basepeak = yes

464.h264ref: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2  
-ansi-alias

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -ansi-alias  
-opt-ra-region-strategy=block -Wl,-z,muldefs  
-L/sh -lsmartheap

473.astar: basepeak = yes

Continued on next page
Dell Inc.  
PowerEdge R730 (Intel Xeon E5-2623 v4, 2.60 GHz)  

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**Hardware Availability:** Jun-2016  
**Software Availability:** Mar-2016

**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-ic16.0-official-linux64.html  

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

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml  
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.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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