Dell Inc.

PowerEdge R630 (Intel Xeon E5-2699 v4, 2.20 GHz)

**SPECint®2006 = 73.3**

**SPECint_base2006 = 71.3**

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

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

---

### Hardware

- **CPU Name:** Intel Xeon E5-2699 v4
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.60 GHz
- **CPU MHz:** 2200
- **FPU:** Integrated
- **CPU(s) enabled:** 44 cores, 2 chips, 22 cores/chip
- **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:** 55 MB I+D on chip per chip
- **Other Cache:** None
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)
- **Disk Subsystem:** 1 x 120 GB SATA SSD
- **Other Hardware:** None

---

### Software

- **Operating System:** SUSE Linux Enterprise Server 12 SP1 3.12.49-11-default
- **Compiler:** C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux
- **Auto Parallel:** Yes
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 32/64-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** Microquill SmartHeap V10.2
Dell Inc.

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SPECint2006 = 73.3

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Results Table

<table>
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<th>Seconds</th>
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<td>87.5</td>
<td>79.0</td>
<td>87.4</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The config file option 'submit' was used.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

BIOS settings:
- Snoop Mode set to Opportunistic Snoop Broadcast
- Virtualization Technology disabled
- CPU Power Management set to Maximum Performance
- Memory Patrol Scrub disabled
- C states set to Autonomous
- Energy Efficient Policy set to Performance
- Energy Efficient Turbo disabled
- C1E disabled
- Uncore Frequency set to Dynamic
- Logical Processor disabled
Symsinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1

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

Continued on next page
Dell Inc.

PowerEdge R630 (Intel Xeon E5-2699 v4, 2.20 GHz)

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SPECint_base2006 = 71.3

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.
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Platform Notes (Continued)

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2699 v4 @ 2.20GHz
  2 "physical id"s (chips)
  44 "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 : 22
siblings : 22
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
  28
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
  28
  cache size : 56320 KB

From /proc/meminfo
MemTotal: 529333384 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP1

From /etc/*release*/etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 1
  # 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-SP1"
  VERSION_ID="12.1"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
  (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 16 22:11

SPEC is set to: /root/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 104G 7.4G 97G 8% /

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program
Continued on next page
SPEC CINT2006 Result

Dell Inc.

PowerEdge R630 (Intel Xeon E5-2699 v4, 2.20 GHz)

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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. 2.0.1 02/12/2016
Memory:
16x 00CE00B300CE M393A4K40BB1-CRC 32 GB 2 rank 2400 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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
OMP_NUM_THREADS = "44"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled

Base Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
**SPEC CINT2006 Result**

**Dell Inc.**

PowerEdge R630 (Intel Xeon E5-2699 v4, 2.20 GHz)

| SPECint2006 | 73.3 |
| SPECint_base2006 | 71.3 |

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

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**Base Optimization Flags**

C benchmarks:
- `-xCORE-AVX2`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-parallel`  
- `-opt-prefetch`  
- `-auto-p32`

C++ benchmarks:
- `-xCORE-AVX2`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-opt-prefetch`  
- `-auto-p32`  
- `-Wl,-z,muldefs`  
- `-L/sh`  
- `-lsmartheap64`

---

**Base Other Flags**

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

---

**Peak Compiler Invocation**

C benchmarks (except as noted below):
- `icc -m64`

`400.perlbench`: `icc -m32`  
- `-L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

C++ benchmarks (except as noted below):
- `icpc -m32`  
- `-L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

`473.astar`: `icpc -m64`

---

**Peak Portability Flags**

- `400.perlbench`: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32`

- `401.bzip2`: `-DSPEC_CPU_LP64`

- `403.gcc`: `-DSPEC_CPU_LP64`

- `429.mcf`: `-DSPEC_CPU_LP64`

- `445.gobmk`: `-DSPEC_CPU_LP64`

- `456.hmmer`: `-DSPEC_CPU_LP64`

- `458.sjeng`: `-DSPEC_CPU_LP64`

- `462.libquantum`: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`

- `464.h264ref`: `-DSPEC_CPU_LP64`

- `471.omnetpp`: `-D_FILE_OFFSET_BITS=64`

- `473.astar`: `-DSPEC_CPU_LP64`

- `483.xalancbmk`: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`
Dell Inc.  
PowerEdge R630 (Intel Xeon E5-2699 v4, 2.20 GHz)  

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

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

**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)  -opt-prefetch  
   -ansi-alias

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

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc  
   -opt-malloc-options=3 -auto-ilp32

429.mcf: basepeak = yes

445.gobmk: basepeak = yes

456.hmmer: basepeak = yes

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

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

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)  -opt-ra-region-strategy=block  
   -ansi-alias  
   -Wl,-z,muldefs -L/sh -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch  
   -ansi-alias  -Wl,-z,muldefs -L/sh -lsmartheap

**Peak Other Flags**

C benchmarks:

403.gcc: -Dalloca=_alloca
<table>
<thead>
<tr>
<th>Dell Inc.</th>
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<tr>
<td>PowerEdge R630 (Intel Xeon E5-2699 v4, 2.20 GHz)</td>
<td>SPECint_base2006 = 71.3</td>
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**SPECint2006**

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<td>Mar-2016</td>
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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