Dell Inc.
PowerEdge T630 (Intel Xeon E5-2699 v4, 2.20 GHz)

SPECfp®2006 = 122
SPECfp_base2006 = 115

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.
Test date: Jun-2016
Hardware Availability: Jun-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, 2 threads/core
CPU(s) orderable: 1,2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

Software
Operating System: Red Hat Enterprise Linux Server release 7.2 (Maipo)
Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;
Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: xfs

Continued on next page
## SPEC CFP2006 Result

**Dell Inc.**

PowerEdge T630 (Intel Xeon E5-2699 v4, 2.20 GHz)

<table>
<thead>
<tr>
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**CPU2006 license:** 55

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**Tested by:** Dell Inc.

**Software Availability:** Mar-2016

**L3 Cache:** 55 MB I+D on chip per chip

**System State:** Run level 3 (multi-user)

**Other Cache:** None

**Base Pointers:** 64-bit

**Memory:** 512 GB (16 x 32 GB 2Rx8 PC4-2400T-R)

**Peak Pointers:** 32/64-bit

**Disk Subsystem:** 120 GB SATA SSD

**Other Software:** None

**Other Hardware:** None

### Results Table

<table>
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<th>Seconds</th>
<th>Ratio</th>
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</tbody>
</table>

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

### Operating System Notes

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

### Platform Notes

- BIOS settings: Snoop Mode set to Home Snoop
- Virtualization Technology disabled
- System Profile set to custom
- CPU Performance set to Maximum Performance
- C States set to Autonomous
- C1E enabled
- Energy Efficient Turbo disabled
- Uncore Frequency set to Dynamic
- Energy Efficiency Policy set to Performance

Continued on next page
Dell Inc.

PowerEdge T630 (Intel Xeon E5-2699 v4, 2.20 GHz)  

**SPECfp2006 =** 122  
**SPECfp_base2006 =** 115

<table>
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<td>Test sponsor:</td>
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<td>Dell Inc.</td>
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<tr>
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<td>Mar-2016</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

Memory Patrol Scrub disabled  
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914  
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1 running on localhost.localdomain Wed Jun 22 09:00:54 2016

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) CPU E5-2699 v4 @ 2.20GHz  
2 "physical id"s (chips)  
88 "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 : 22  
siblings : 44  
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: 528280408 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 Jun 22 04:11

SPEC is set to: /root/cpu2006-1.2  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sda2 xfs 94G 9.8G 84G 11% /  
Continued on next page
Dell Inc.

PowerEdge T630 (Intel Xeon E5-2699 v4, 2.20 GHz)

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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. 2.2.1 06/06/2016
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,compact,1,0"
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

Fortran benchmarks:
ifort  -m64

Benchmarks using both Fortran and C:
icc  -m64 ifort  -m64

**Base Portability Flags**

410.bwaves:  -DSPEC_CPU_LP64
416.gamess:  -DSPEC_CPU_LP64
433.milc:  -DSPEC_CPU_LP64
434.zeusmp:  -DSPEC_CPU_LP64

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Dell Inc.  
PowerEdge T630 (Intel Xeon E5-2699 v4, 2.20 GHz)  

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Base Portability Flags (Continued)

435.gromacs: -DSPEC_CPU_LP64 -nofor_main  
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main  
437.leslie3d: -DSPEC_CPU_LP64  
444.namd: -DSPEC_CPU_LP64 -nofor_main  
447.dealII: -DSPEC_CPU_LP64  
450.soplex: -DSPEC_CPU_LP64  
453.povray: -DSPEC_CPU_LP64  
454.calculix: -DSPEC_CPU_LP64 -nofor_main  
459.GemsFDTD: -DSPEC_CPU_LP64  
463.tonto: -DSPEC_CPU_LP64  
470.lbm: -DSPEC_CPU_LP64  
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX  
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

C++ benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

Peak Compiler Invocation

C benchmarks:  
icc -m64

C++ benchmarks:  
icpc -m64

Fortran benchmarks:  
ifort -m64

Benchmarks using both Fortran and C:  
icc -m64 ifort -m64
## Dell Inc.

**PowerEdge T630 (Intel Xeon E5-2699 v4, 2.20 GHz)**

### SPECfp2006 = 122

### SPECfp_base2006 = 115

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

---

## Peak Portability Flags

Same as Base Portability Flags

---

## Peak Optimization Flags

### C benchmarks:

- 433.milc: basepeak = yes
- 470.lbm: basepeak = yes
- 482.sphinx3: basepeak = yes

### C++ benchmarks:

- 444.namd: `-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) -fno-alias -auto-ilp32`
- 447.dealII: basepeak = yes
- 450.soplex: basepeak = yes
- 453.povray: `-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 -ansi-alias`

### Fortran benchmarks:

- 410.bwaves: basepeak = yes
- 416.gamess: `-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 -inline-level=0 -scalar-rep-`
- 434.zeusmp: basepeak = yes
- 437.leslie3d: basepeak = yes
- 459.GemsFDTD: `-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 -inline-level=0 -opt-prefetch -parallel`
- 465.tonto: `-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) -inline-calloc`

Continued on next page
Dell Inc.

PowerEdge T630 (Intel Xeon E5-2699 v4, 2.20 GHz)

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### Peak Optimization Flags (Continued)

465.tonto (continued):
- `-opt-malloc-options=3`  
- `-auto`  
- `-unroll14`

Benchmarks using both Fortran and C:

435.gromacs: `basepeak = yes`

436.cactusADM: `basepeak = yes`

454.calculix:
- `-xCORE-AVX2`  
- `-ipo`  
- `-no-prec-div`  
- `-auto-ilp32`  
- `-ansi-alias`

481.wrf: `basepeak = yes`

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.

Tested with SPEC CPU2006 v1.2.  
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