SPEC® CFP2006 Result
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Dell Inc.

PowerEdge T630 (Intel Xeon E5-2630L v4, 1.80 GHz)

$SPECfp^{®}\_rate2006 = 608$
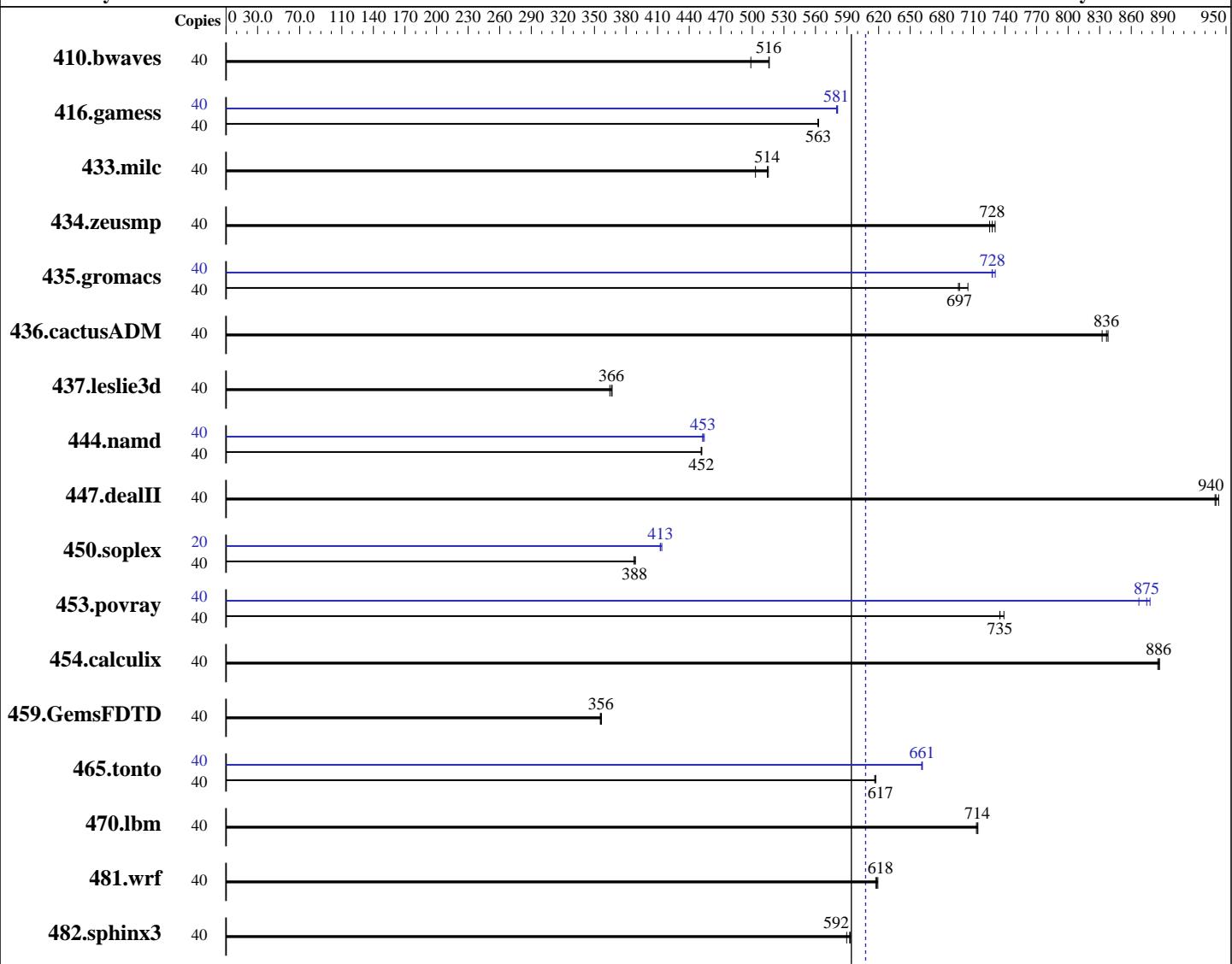
$SPECfp\_rate\_base2006 = 594$

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

Copies 0 30.0 70.0 110 140 170 200 230 260 290 320 350 380 410 440 470 500 530 560 590 620 650 680 710 740 770 800 830 860 890 950

Benchmark	Copies	Result
410.bwaves	40	516
416.gamess	40	581
416.gamess	40	563
433.milc	40	514
434.zeusmp	40	728
435.gromacs	40	728
435.gromacs	40	697
436.cactusADM	40	836
437.leslie3d	40	366
444.namd	40	453
444.namd	40	452
447.dealII	40	940
450.soplex	20	413
450.soplex	40	388
453.povray	40	875
453.povray	40	735
454.calculix	40	886
459.GemsFDTD	40	356
465.tonto	40	661
465.tonto	40	617
470.lbm	40	714
481.wrf	40	618
482.sphinx3	40	592

SPECfp_rate_base2006 = 594

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Hardware

CPU Name: Intel Xeon E5-2630L v4
CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz
CPU MHz: 1800
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 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
Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 7.1 (Maipo)
3.10.0-229.el7.x86_64
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: No
File System: xfs
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L3 Cache:	25 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 300 GB 15000 RPM SAS		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	40	1090	499	1053	516	**1054**	**516**	40	1090	499	1053	516	**1054**	**516**
416.gamess	40	1393	562	1391	563	**1392**	**563**	40	**1349**	**581**	1348	581	1350	580
433.milc	40	730	503	713	515	**714**	**514**	40	730	503	713	515	**714**	**514**
434.zeusmp	40	**500**	**728**	498	731	502	725	40	**500**	**728**	498	731	502	725
435.gromacs	40	**410**	**697**	405	705	410	696	40	391	731	**392**	**728**	392	728
436.cactusADM	40	574	832	**571**	**836**	570	838	40	574	832	**571**	**836**	570	838
437.leslie3d	40	1031	365	**1027**	**366**	1025	367	40	1031	365	**1027**	**366**	1025	367
444.namd	40	710	452	711	451	**710**	**452**	40	**708**	**453**	708	453	706	454
447.dealII	40	485	943	487	940	**487**	**940**	40	485	943	487	940	**487**	**940**
450.soplex	40	858	389	**860**	**388**	861	388	20	403	414	**404**	**413**	404	413
453.povray	40	**289**	**735**	289	735	288	739	40	242	878	245	867	**243**	**875**
454.calculix	40	**372**	**886**	373	885	372	887	40	**372**	**886**	373	885	372	887
459.GemsFDTD	40	**1192**	**356**	1190	357	1194	356	40	**1192**	**356**	1190	357	1194	356
465.tonto	40	638	617	639	616	**638**	**617**	40	**595**	**661**	596	661	595	662
470.lbm	40	**770**	**714**	769	714	771	713	40	**770**	**714**	769	714	771	713
481.wrf	40	721	619	**723**	**618**	724	617	40	721	619	**723**	**618**	724	617
482.sphinx3	40	1322	590	1314	593	**1316**	**592**	40	1322	590	1314	593	**1316**	**592**

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

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Platform Notes (Continued)

```
System Profile set to 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 Sat Jan 16 17:00:31 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 E5-2630L v4 @ 1.80GHz
      2 "physical id"s (chips)
      40 "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 : 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
   cache size : 25600 KB

From /proc/meminfo
   MemTotal:       528284160 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.1 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.1"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.1:ga:server

uname -a:
   Linux localhost.localdomain 3.10.0-229.el7.x86_64 #1 SMP Thu Jan 29 18:37:38
   EST 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 16 03:05

SPEC is set to: /root/cpu2006-1.2
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda1       xfs   218G   13G  206G   6% /
Additional information from dmidecode:
```
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Platform Notes (Continued)

```
   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. 1.7.12 12/22/2015
   Memory:
   16x 00CE00B300CE M393A4K40BB1-CRC 32 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"

 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
 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    -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
```

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Base Portability Flags (Continued)

```
      433.milc: -DSPEC_CPU_LP64
    434.zeusmp: -DSPEC_CPU_LP64
    435.gromacs: -DSPEC_CPU_LP64 -nofor_main
  436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
    437.leslie3d: -DSPEC_CPU_LP64
      444.namd: -DSPEC_CPU_LP64
     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
      465.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 -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Peak Compiler Invocation

C benchmarks:

```
icc   -m64
```

C++ benchmarks (except as noted below):

```
icpc   -m64
```

```
 450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

Fortran benchmarks:

```
ifort -m64
```

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Peak Compiler Invocation (Continued)

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

Peak Portability Flags

```
      410.bwaves: -DSPEC_CPU_LP64
      416.gamess: -DSPEC_CPU_LP64
        433.milc: -DSPEC_CPU_LP64
      434.zeusmp: -DSPEC_CPU_LP64
     435.gromacs: -DSPEC_CPU_LP64 -nofor_main
    436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
     437.leslie3d: -DSPEC_CPU_LP64
        444.namd: -DSPEC_CPU_LP64
       447.dealII: -DSPEC_CPU_LP64
      450.soplex: -D_FILE_OFFSET_BITS=64
      453.povray: -DSPEC_CPU_LP64
     454.calculix: -DSPEC_CPU_LP64 -nofor_main
    459.GemsFDTD: -DSPEC_CPU_LP64
       465.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
```

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) -opt-mem-layout-trans=3(pass 2)
                  -prof-use(pass 2) -fno-alias -auto-ilp32

       447.dealII: basepeak = yes

      450.soplex: -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) -opt-mem-layout-trans=3(pass 2)
                  -prof-use(pass 2) -opt-malloc-options=3
```

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Peak Optimization Flags (Continued)

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)` `-opt-mem-layout-trans=3(pass 2)`
`-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: basepeak = yes

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)` `-unroll4` `-auto`
`-inline-calloc` `-opt-malloc-options=3`

Benchmarks using both Fortran and C:

435.gromacs: `-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)` `-opt-mem-layout-trans=3(pass 2)`
`-prof-use(pass 2)` `-opt-prefetch` `-auto-ilp32`

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

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
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.html

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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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