SPEC® CFP2006 Result

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Dell Inc.

$SPECfp^®\_rate2006 =$ Not Run

PowerEdge R540 (Intel Xeon Gold 5122, 3.60 GHz)
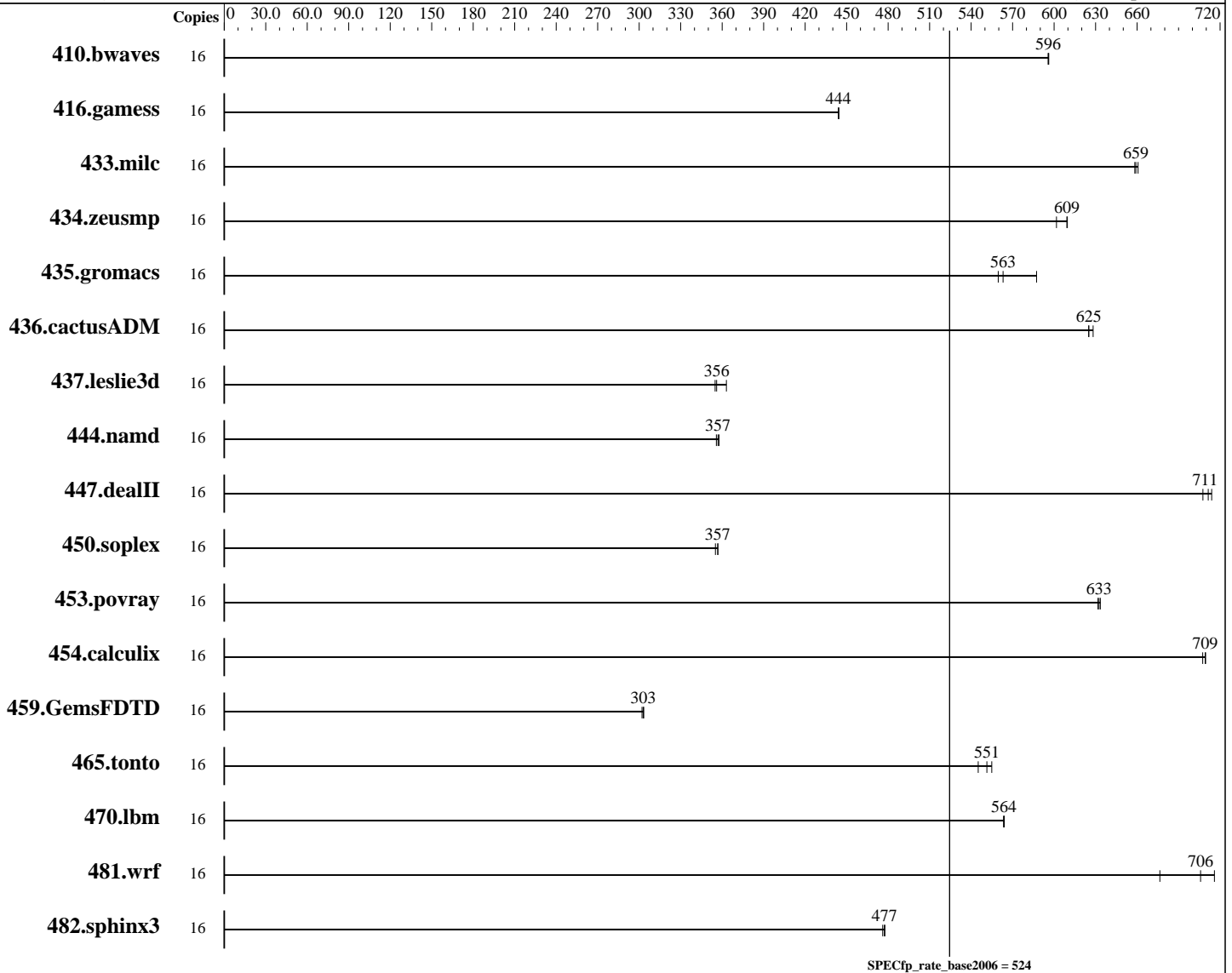
$SPECfp\_rate\_base2006 =$ 524

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

Test date: Aug-2017
Hardware Availability: Sep-2017
Software Availability: Apr-2017

Benchmark	Copies	Result
410.bwaves	16	596
416.gamess	16	444
433.milc	16	659
434.zeusmp	16	609
435.gromacs	16	563
436.cactusADM	16	625
437.leslie3d	16	356
444.namd	16	357
447.dealII	16	711
450.soplex	16	357
453.povray	16	633
454.calculix	16	709
459.GemsFDTD	16	303
465.tonto	16	551
470.lbm	16	564
481.wrf	16	706
482.sphinx3	16	477

SPECfp_rate_base2006 = 524

Hardware

CPU Name: Intel Xeon Gold 5122
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 3600
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: 1 MB I+D on chip per core

Continued on next page

Software

Operating System: SUSE Linux Enterprise Server 12 SP2
4.4.21-69-default
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++
Compiler for Linux;
Fortran: Version 17.0.3.191 of Intel Fortran
Compiler for Linux
Auto Parallel: No
File System: xfs
System State: Run level 3 (multi-user)

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info@spec.org
http://www.spec.org/

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L3 Cache:	16.5 MB I+D on chip per chip
Other Cache:	None
Memory:	192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem:	1 x 1 TB SATA 7200 RPM
Other Hardware:	None

Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	365	596	**365**	**596**	365	596							
416.gamess	16	**705**	**444**	705	444	705	444							
433.milc	16	223	658	**223**	**659**	222	661							
434.zeusmp	16	242	602	239	610	**239**	**609**							
435.gromacs	16	204	560	**203**	**563**	195	587							
436.cactusADM	16	304	628	**306**	**625**	306	625							
437.leslie3d	16	**422**	**356**	424	355	414	363							
444.namd	16	361	356	359	358	**359**	**357**							
447.dealII	16	259	708	**257**	**711**	256	714							
450.soplex	16	**374**	**357**	376	355	374	357							
453.povray	16	**135**	**633**	135	632	134	633							
454.calculix	16	**186**	**709**	186	710	187	707							
459.GemsFDTD	16	**560**	**303**	562	302	560	303							
465.tonto	16	289	545	**286**	**551**	284	555							
470.lbm	16	390	563	390	564	**390**	**564**							
481.wrf	16	250	716	**253**	**706**	264	676							
482.sphinx3	16	653	478	**653**	**477**	655	476							

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

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Platform Notes (Continued)

```
     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 /root/cpu2006-1.2_ic17u3/config/sysinfo.rev6993
     Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
     running on linux-28u4 Wed Aug 30 04:50:56 2017

     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) Gold 5122 CPU @ 3.60GHz
           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 2 3 4 10
           physical 1: cores 1 5 9 13
        cache size : 16896 KB

     From /proc/meminfo
        MemTotal:       196687084 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"
```

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Platform Notes (Continued)

```
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12:sp2"

  uname -a:
     Linux linux-28u4 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 Aug 30 00:55

  SPEC is set to: /root/cpu2006-1.2_ic17u3
     Filesystem      Type  Size  Used Avail Use% Mounted on
     /dev/sda2       xfs   927G  9.1G  918G   1% /
  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. 1.0.0 08/10/2017
     Memory:
     8x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666 MHz
     4x 002C0632002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666 MHz
     4x 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_ic17u3/lib/ia32:/root/cpu2006-1.2_ic17u3/lib/intel64:/root/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 -m64

C++ benchmarks:
    icpc -m64

Continued on next page

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Base Compiler Invocation (Continued)

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
   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 -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

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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-ic17.0-official-linux64-revF.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.xml

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