SPEC® CFP2006 Result

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10
(2.00 GHz, AMD EPYC 7401)

$SPECfp^®\_rate2006 =$ Not Run
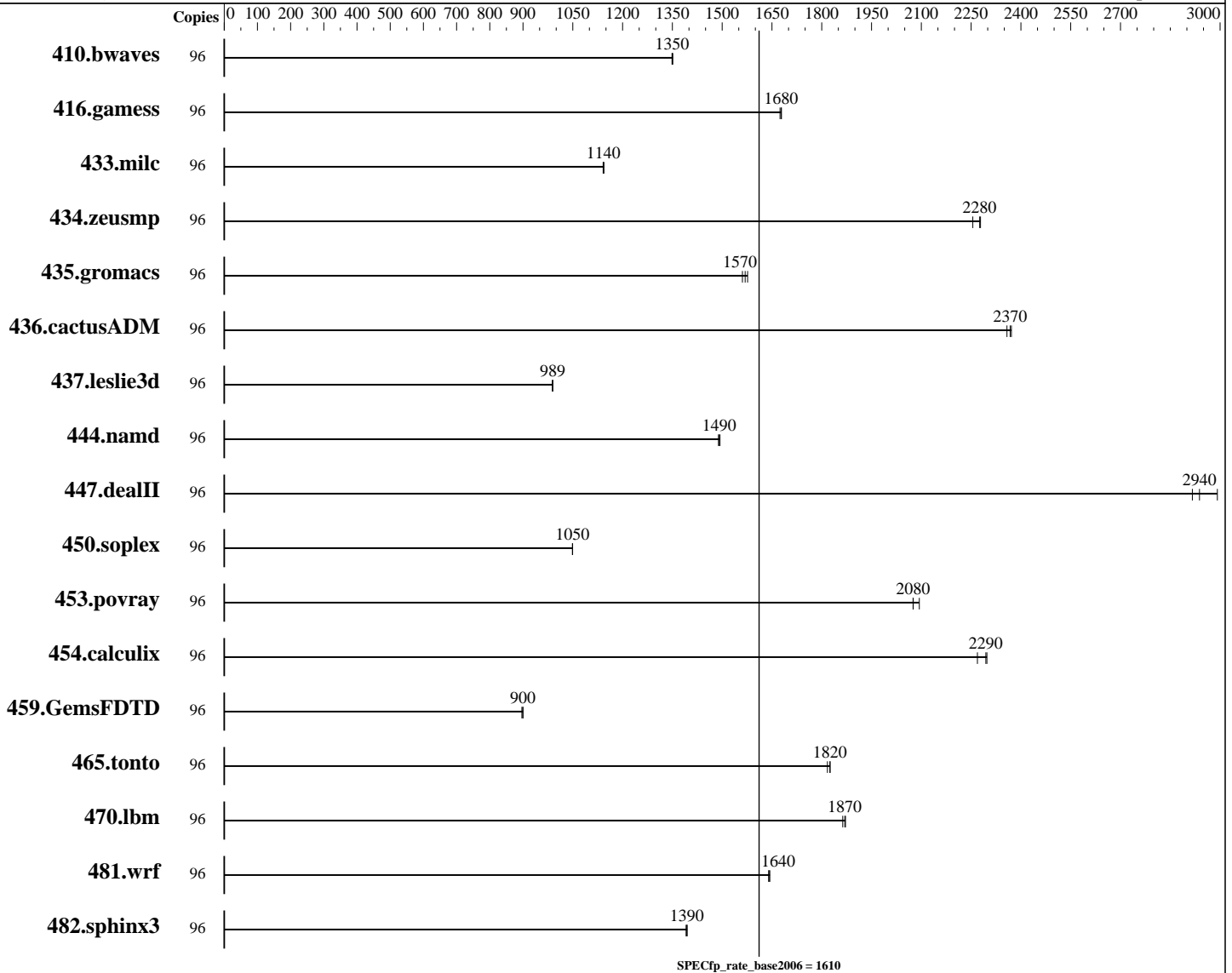
$SPECfp\_rate\_base2006 =$ 1610

CPU2006 license: 3	**Test date:** Nov-2017
Test sponsor: HPE	**Hardware Availability:** Nov-2017
Tested by: HPE	**Software Availability:** Sep-2017

Benchmark	Copies	Result
410.bwaves	96	1350
416.gamess	96	1680
433.milc	96	1140
434.zeusmp	96	2280
435.gromacs	96	1570
436.cactusADM	96	2370
437.leslie3d	96	989
444.namd	96	1490
447.dealII	96	2940
450.soplex	96	1050
453.povray	96	2080
454.calculix	96	2290
459.GemsFDTD	96	900
465.tonto	96	1820
470.lbm	96	1870
481.wrf	96	1640
482.sphinx3	96	1390

SPECfp_rate_base2006 = 1610

Hardware

CPU Name: AMD EPYC 7401
CPU Characteristics: AMD Turbo CORE technology up to 3.00 GHz
CPU MHz: 2000
FPU: Integrated
CPU(s) enabled: 48 cores, 2 chips, 24 cores/chip, 2 threads/core
CPU(s) orderable: 1, 2 chip(s)
Primary Cache: 64 KB I + 32 KB D on chip per core
Secondary Cache: 512 KB I+D on chip per core

Continued on next page

Software

Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP3 Kernel 4.4.73-5-default
Compiler: C/C++/Fortran: Version 4.5.2.1 of x86 Open64 Compiler Suite (from AMD)
Auto Parallel: No
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable

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L3 Cache:	64 MB I+D on chip per chip, 8 MB shared / 3 cores	Other Software: None
Other Cache:	None	
Memory:	1 TB (16 x 64 GB 4Rx4 PC4-2666V-L)	
Disk Subsystem:	1 x 400 GB SAS SSD, RAID 0	
Other Hardware:	None	

Results Table

Benchmark	**Base**							**Peak**						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	96	967	1350	**967**	**1350**	965	1350							
416.gamess	96	1120	1680	1123	1670	**1120**	**1680**							
433.milc	96	770	1140	**772**	**1140**	772	1140							
434.zeusmp	96	**384**	**2280**	383	2280	387	2260							
435.gromacs	96	**437**	**1570**	439	1560	435	1580							
436.cactusADM	96	**485**	**2370**	484	2370	487	2360							
437.leslie3d	96	**912**	**989**	912	990	913	989							
444.namd	96	517	1490	**516**	**1490**	516	1490							
447.dealII	96	**374**	**2940**	377	2920	367	2990							
450.soplex	96	763	1050	**763**	**1050**	763	1050							
453.povray	96	**246**	**2080**	246	2080	244	2090							
454.calculix	96	349	2270	**345**	**2290**	345	2300							
459.GemsFDTD	96	1136	897	**1132**	**900**	1132	900							
465.tonto	96	**518**	**1820**	520	1820	518	1830							
470.lbm	96	**706**	**1870**	708	1860	705	1870							
481.wrf	96	**653**	**1640**	654	1640	652	1640							
482.sphinx3	96	1345	1390	1342	1390	**1343**	**1390**							

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.
'numactl' was used to bind copies to the cores.
See the configuration file for details.
```

Operating System Notes

```
Set vm/nr_hugepages=86016 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

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Tested by:	HPE	**Software Availability:**	Sep-2017

Platform Notes

```
 BIOS Configuration:
  Thermal Configuration set to Maximum Cooling
  Performance Determinism set to Power Deterministic
  Memory Patrol Scrubbing set to Disabled
  Workload Profile set to General Throughput Compute
  Minimum Processor Idle Power Core C-State set to C6 State
  Processor Power and Utilization Monitoring set to Disabled
```

General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_LIMIT = "896"
LD_LIBRARY_PATH = "/home/cpu2006/amd1603-rate-libs-revB/32:/home/cpu2006/amd1603-rate-libs-revB/64"

The binaries were built with the x86 Open64 Compiler Suite,
which is only available from (and supported by) AMD at
http://developer.amd.com/tools-and-sdks/cpu-development/x86-open64-compiler-suite/
```

Base Compiler Invocation

C benchmarks:
        opencc

C++ benchmarks:
        openCC

Fortran benchmarks:
        openf95

Benchmarks using both Fortran and C:
        opencc openf95

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
      436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
       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
```

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Base Portability Flags (Continued)

```
    454.calculix: -DSPEC_CPU_LP64
   459.GemsFDTD: -DSPEC_CPU_LP64
       465.tonto: -DSPEC_CPU_LP64
        470.lbm: -DSPEC_CPU_LP64
        481.wrf: -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
                 -fno-second-underscore
     482.sphinx3: -DSPEC_CPU_LP64
```

Base Optimization Flags

C benchmarks:
```
    -Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
    -IPA:small_pu=100 -mso -march=bdver1 -mno-fma4 -mno-xop -mno-tbm
    -WB, -Wl, -z,muldefs
```

C++ benchmarks:
```
    -Ofast -static -CG:load_exe=0 -OPT:malloc_alg=1 -INLINE:aggressive=on
    -HP:bd=2m:heap=2m -D__OPEN64_FAST_SET -march=bdver2 -mno-fma4
    -mno-xop -mno-tbm -WB, -Wl, -z,muldefs
```

Fortran benchmarks:
```
    -Ofast -LNO:blocking=off -LNO:simd_peel_align=on -OPT:rsqrt=2
    -OPT:unroll_size=256 -HP:bd=2m:heap=2m -mso -march=bdver1 -mno-fma4
    -mno-xop -mno-tbm -WB, -Wl, -z,muldefs
```

Benchmarks using both Fortran and C:
```
    -Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
    -IPA:small_pu=100 -mso -march=bdver1 -mno-fma4 -mno-xop -mno-tbm
    -WB, -Wl, -z,muldefs -LNO:blocking=off -LNO:simd_peel_align=on
    -OPT:rsqrt=2 -OPT:unroll_size=256
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/x86-openflags-rate-revA-I.html
http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revD.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/x86-openflags-rate-revA-I.xml
http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revD.xml

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Test date: Nov-2017
Hardware Availability: Nov-2017
Software Availability: Sep-2017

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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