SPEC® CFP2006 Result

Lenovo Group Limited

$SPECfp^{®}\_rate2006 =$ 947

$SPECfp\_rate\_base2006 =$ 920

Lenovo System x3550 M5
(Intel Xeon E5-2699 v3, 2.30 GHz)

CPU2006 license: 9017	**Test date:**	Nov-2014
Test sponsor: Lenovo Group Limited	**Hardware Availability:**	Oct-2014
Tested by: Lenovo Group Limited	**Software Availability:**	Sep-2014

Copies

Benchmark	Copies	Result
410.bwaves	72	632
416.gamess	72	1300
416.gamess	72	1240
433.milc	72	595
433.milc	72	595
434.zeusmp	72	1030
435.gromacs	72	1470
435.gromacs	72	1450
436.cactusADM	72	1190
437.leslie3d	36	463
437.leslie3d	72	450
444.namd	72	1080
444.namd	72	1060
447.dealII	72	1750
450.soplex	36	564
450.soplex	72	461
453.povray	72	1910
453.povray	72	1690
454.calculix	72	1810
459.GemsFDTD	72	433
465.tonto	72	1130
465.tonto	72	1080
470.lbm	72	867
481.wrf	72	754
481.wrf	72	750
482.sphinx3	72	819

SPECfp_rate_base2006 = 920

SPECfp_rate2006 = 947

Hardware

CPU Name:	Intel Xeon E5-2699 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	36 cores, 2 chips, 18 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

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 6.5 (Santiago) 2.6.32-431.el6.x86_64
Compiler:	C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux; Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	ext4

Continued on next page

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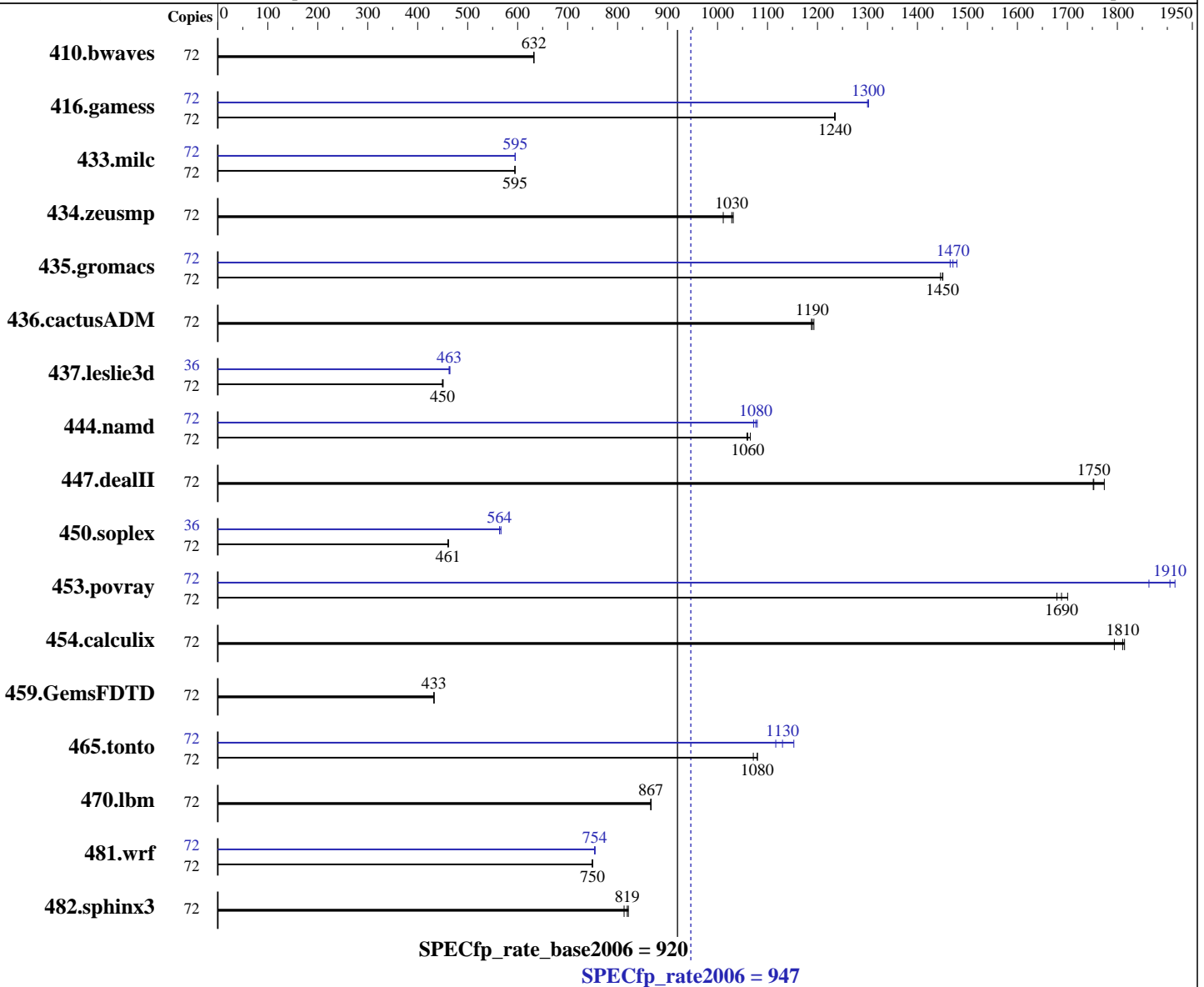$SPECfp\_rate2006 = \quad 947$

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L3 Cache:	45 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 300 GB SAS	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	72	**1547**	**632**	1547	633	1547	632	72	**1547**	**632**	1547	633	1547	632
416.gamess	72	1142	1230	**1141**	**1240**	1141	1240	72	1084	1300	**1083**	**1300**	1083	1300
433.milc	72	1112	595	**1111**	**595**	1111	595	72	1111	595	**1111**	**595**	1110	595
434.zeusmp	72	635	1030	648	1010	**637**	**1030**	72	635	1030	648	1010	**637**	**1030**
435.gromacs	72	**355**	**1450**	354	1450	356	1450	72	351	1470	**349**	**1470**	348	1480
436.cactusADM	72	**723**	**1190**	721	1190	724	1190	72	**723**	**1190**	721	1190	724	1190
437.leslie3d	72	1501	451	1506	450	**1504**	**450**	36	**730**	**463**	728	465	731	463
444.namd	72	542	1070	**545**	**1060**	545	1060	72	**536**	**1080**	535	1080	539	1070
447.dealII	72	**470**	**1750**	470	1750	464	1770	72	**470**	**1750**	470	1750	464	1770
450.soplex	72	1301	462	1304	460	**1303**	**461**	36	532	564	**532**	**564**	530	567
453.povray	72	**227**	**1690**	228	1680	225	1700	72	206	1860	200	1920	**201**	**1910**
454.calculix	72	331	1790	327	1810	**328**	**1810**	72	331	1790	327	1810	**328**	**1810**
459.GemsFDTD	72	1765	433	**1765**	**433**	1768	432	72	1765	433	**1765**	**433**	1768	432
465.tonto	72	656	1080	661	1070	**656**	**1080**	72	635	1120	**627**	**1130**	615	1150
470.lbm	72	1141	867	1142	866	**1142**	**867**	72	1141	867	1142	866	**1142**	**867**
481.wrf	72	**1073**	**750**	1072	750	1074	749	72	1067	754	**1066**	**754**	1065	755
482.sphinx3	72	1726	813	**1713**	**819**	1708	822	72	1726	813	**1713**	**819**	1708	822

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 setting:
Operating Mode set to "Efficiency-Favor Performance"
COD Preference set to Enable

Continued on next page

Lenovo Group Limited

Lenovo System x3550 M5
(Intel Xeon E5-2699 v3, 2.30 GHz)

SPECfp_rate2006 = 947

SPECfp_rate_base2006 = 920

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Test date: Nov-2014
Hardware Availability: Oct-2014
Software Availability: Sep-2014

Platform Notes (Continued)

```
Sysinfo program /root/SPECCpu2014Sep01/config/sysinfo.rev6874
$Rev: 6874 $ $Date:: 2013-11-20 #$ 654bd3fcf53b06faef0efe54ed011998
running on x3550M5-01 Wed Nov 12 15:57:09 2014

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 v3 @ 2.30GHz
      2 "physical id"s (chips)
      72 "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 : 18
      siblings  : 36
      physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
   cache size : 23040 KB

From /proc/meminfo
   MemTotal:        264150108 kB
   HugePages_Total:         0
   Hugepagesize:         2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.5 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux x3550M5-01 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 12 15:51

SPEC is set to: /root/SPECCpu2014Sep01
   Filesystem                   Type  Size  Used Avail Use% Mounted on
   /dev/mapper/VolGroup-lv_root ext4  271G  149G  108G  59% /
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 IBM -[TBE101YUS-1.00]- 09/22/2014
   Memory:
```

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SPECfp_rate2006 =   947

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CPU2006 license: 9017		**Test date:**	Nov-2014
Test sponsor: Lenovo Group Limited		**Hardware Availability:**	Oct-2014
Tested by: Lenovo Group Limited		**Software Availability:**	Sep-2014

Platform Notes (Continued)

```
    14x Hynix 484D4134324752374D4652344E2D54462020 16 GB 2 rank 2133 MHz
    2x Hynix 484D4134324752374D4652344E2D54465431 16 GB 2 rank 2133 MHz
    8x NO DIMM Unknown

  (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/SPECCpu2014Sep01/libs/32:/root/SPECCpu2014Sep01/libs/64:/root/SPECCpu2014Sep01/sh"
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_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
        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
```

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Lenovo System x3550 M5
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$SPECfp\_rate2006 =$ 947

$SPECfp\_rate\_base2006 =$ 920

CPU2006 license: 9017

Test sponsor: Lenovo Group Limited

Tested by: Lenovo Group Limited

Test date: Nov-2014

Hardware Availability: Oct-2014

Software Availability: Sep-2014

Base Portability Flags (Continued)

```
     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
```

Fortran benchmarks:
```
    ifort -m64
```

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
```

Continued on next page

Lenovo Group Limited

Lenovo System x3550 M5
(Intel Xeon E5-2699 v3, 2.30 GHz)

SPECfp_rate2006 =   947

SPECfp_rate_base2006 =   920

CPU2006 license: 9017

Test sponsor: Lenovo Group Limited

Tested by: Lenovo Group Limited

Test date: Nov-2014

Hardware Availability: Oct-2014

Software Availability: Sep-2014

Peak Portability Flags (Continued)

```
  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
   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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
             -auto-ilp32

    470.lbm: basepeak = yes

  482.sphinx3: basepeak = yes
```

C++ benchmarks:

```
    444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -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(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
             -opt-malloc-options=3

   453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4
             -ansi-alias
```

Fortran benchmarks:

Lenovo Group Limited

Lenovo System x3550 M5
(Intel Xeon E5-2699 v3, 2.30 GHz)

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SPECfp_rate_base2006 = 920

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Test date: Nov-2014
Hardware Availability: Oct-2014
Software Availability: Sep-2014

Peak Optimization Flags (Continued)

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
            -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
            -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
           -O3(pass 2) -no-prec-div(pass 2) -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(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -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: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-B.20141230.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-B.20141230.xml

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

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