SPEC® CFP2006 Result
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Lenovo Group Limited

Lenovo System x3500 M5
(Intel Xeon E5-2699 v3, 2.30 GHz)

$SPECfp^{®}2006 =$ 116

$SPECfp\_base2006 =$ 109

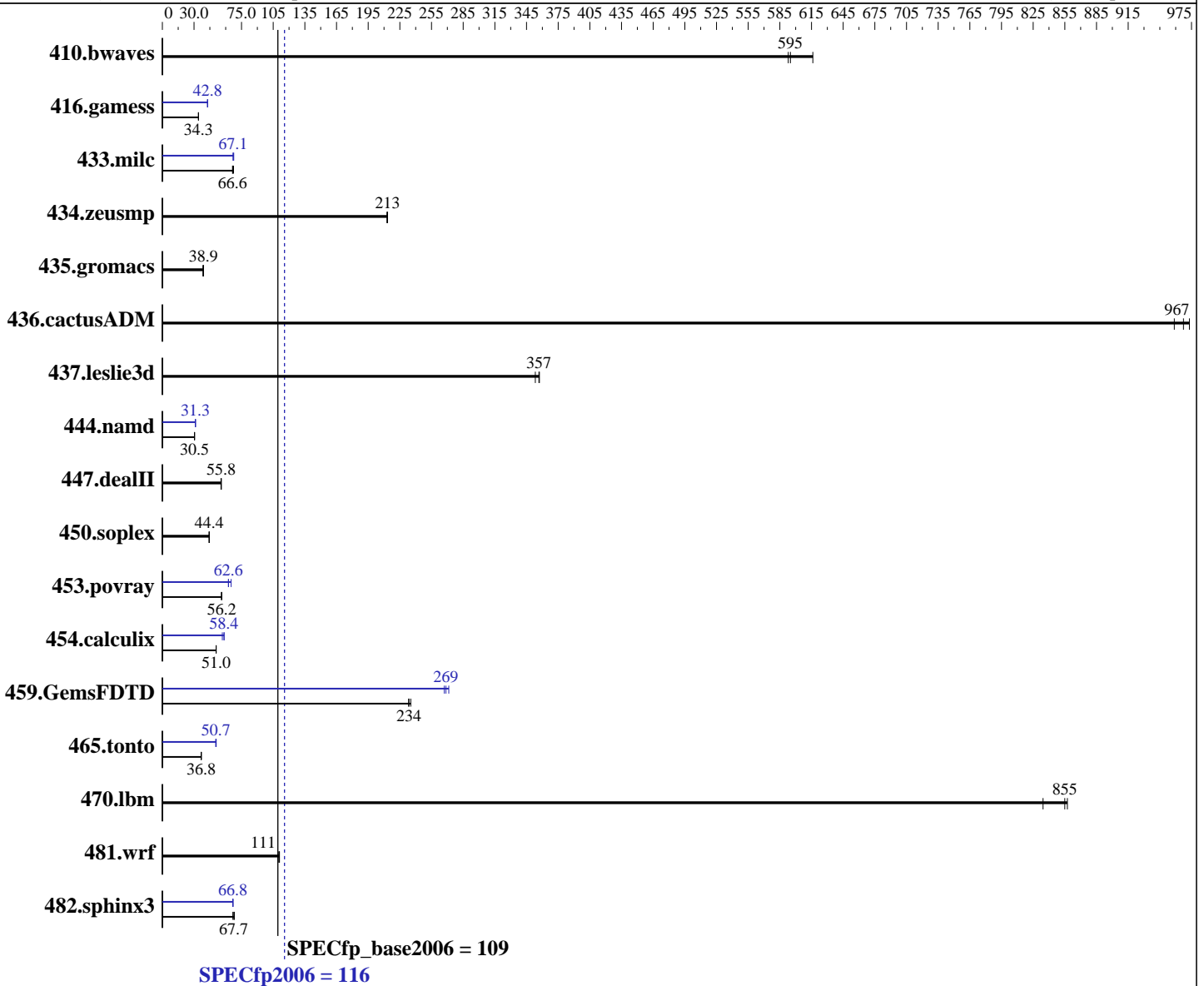|	
CPU2006 license: 9017	**Test date:** Jan-2015
Test sponsor: Lenovo Group Limited	**Hardware Availability:** Jan-2015
Tested by: Lenovo Group Limited	**Software Availability:** Sep-2014

SPECfp_base2006 = 109

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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
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 7.0 (Maipo)
	3.10.0-123.el7.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:	Yes
File System:	xfs

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L3 Cache:	45 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)
Disk Subsystem:	1 x 1000 GB SATA
Other Hardware:	None

System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**22.8**	**595**	22.9	593	22.1	616	**22.8**	**595**	22.9	593	22.1	616
416.gamess	573	34.1	572	34.3	**572**	**34.3**	458	42.8	457	42.9	**457**	**42.8**
433.milc	138	66.5	**138**	**66.6**	136	67.4	136	67.6	137	67.1	**137**	**67.1**
434.zeusmp	42.7	213	**42.7**	**213**	42.8	213	42.7	213	**42.7**	**213**	42.8	213
435.gromacs	**184**	**38.9**	186	38.4	183	38.9	**184**	**38.9**	186	38.4	183	38.9
436.cactusADM	12.3	973	12.5	959	**12.4**	**967**	12.3	973	12.5	959	**12.4**	**967**
437.leslie3d	**26.4**	**357**	26.3	357	26.6	353	**26.4**	**357**	26.3	357	26.6	353
444.namd	**263**	**30.5**	263	30.5	263	30.5	256	31.3	256	31.3	**256**	**31.3**
447.dealII	**205**	**55.8**	206	55.5	205	55.8	**205**	**55.8**	206	55.5	205	55.8
450.soplex	**188**	**44.4**	187	44.5	189	44.2	**188**	**44.4**	187	44.5	189	44.2
453.povray	94.6	56.2	95.0	56.0	**94.7**	**56.2**	**84.9**	**62.6**	81.7	65.2	85.0	62.6
454.calculix	162	50.9	162	51.0	**162**	**51.0**	**141**	**58.4**	145	56.8	141	58.5
459.GemsFDTD	45.1	235	**45.4**	**234**	45.5	233	39.1	271	**39.5**	**269**	39.7	267
465.tonto	266	37.0	**267**	**36.8**	268	36.7	193	51.0	**194**	**50.7**	194	50.6
470.lbm	16.5	834	**16.1**	**855**	16.0	857	16.5	834	**16.1**	**855**	16.0	857
481.wrf	**101**	**111**	101	111	101	110	**101**	**111**	101	111	101	110
482.sphinx3	286	68.2	292	66.8	**288**	**67.7**	**292**	**66.8**	291	67.0	292	66.7

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 setting:
Operating Mode set to "Efficiency-Favor Performance"
Intel Hyperthreading set to Disabled
COD Preference set to Disable
Early Snoop Preference set to Disable
Sysinfo program /root/SPECcpu_15/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on x3500M5 Sat Jan 10 07:31:21 2015

This section contains SUT (System Under Test) info as seen by
```

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Platform Notes (Continued)

```
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)
      36 "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  : 18
      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 : 46080 KB

From /proc/meminfo
   MemTotal:       263455364 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.0 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.0"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

uname -a:
   Linux x3500M5 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014 x86_64
   x86_64 x86_64 GNU/Linux

run-level 3 Jan 10 07:22

SPEC is set to: /root/SPECcpu_15
   Filesystem          Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-root xfs   927G  9.4G  917G   2% /
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 -[TAE103F-1.02]- 12/05/2014
```
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Platform Notes (Continued)

```
    Memory:
     3x Hynix HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz
     13x Hynix HMA42GR7MFR4N-TFT1 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:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/root/SPECcpu_15/libs/32:/root/SPECcpu_15/libs/64:/root/SPECcpu_15/sh"
OMP_NUM_THREADS = "36"

 Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB
 memory using RedHat EL 7.0
 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
    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
```

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Base Portability Flags (Continued)

```
     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 -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
```

Peak Portability Flags

```
Same as Base Portability Flags
```

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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) -prof-use(pass 2)`
`-auto-ilp32 -ansi-alias`

      470.lbm: `basepeak = yes`

    482.sphinx3: `-xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias`
`-parallel`

C++ benchmarks:

     444.namd: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
`-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)`
`-fno-alias -auto-ilp32`

    447.dealII: `basepeak = yes`

    450.soplex: `basepeak = yes`

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

Fortran benchmarks:

    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: `basepeak = yes`

   459.GemsFDTD: `-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 -opt-prefetch -parallel`

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

Benchmarks using both Fortran and C:

    435.gromacs: `basepeak = yes`

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Peak Optimization Flags (Continued)

436.cactusADM: basepeak = yes

454.calculix: -xCORE-AVX2 -ipo -O3 -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-ic15.0-official-linux64.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-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-B.20141230.xml

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