SPEC® CFP2006 Result

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Lenovo Group Limited

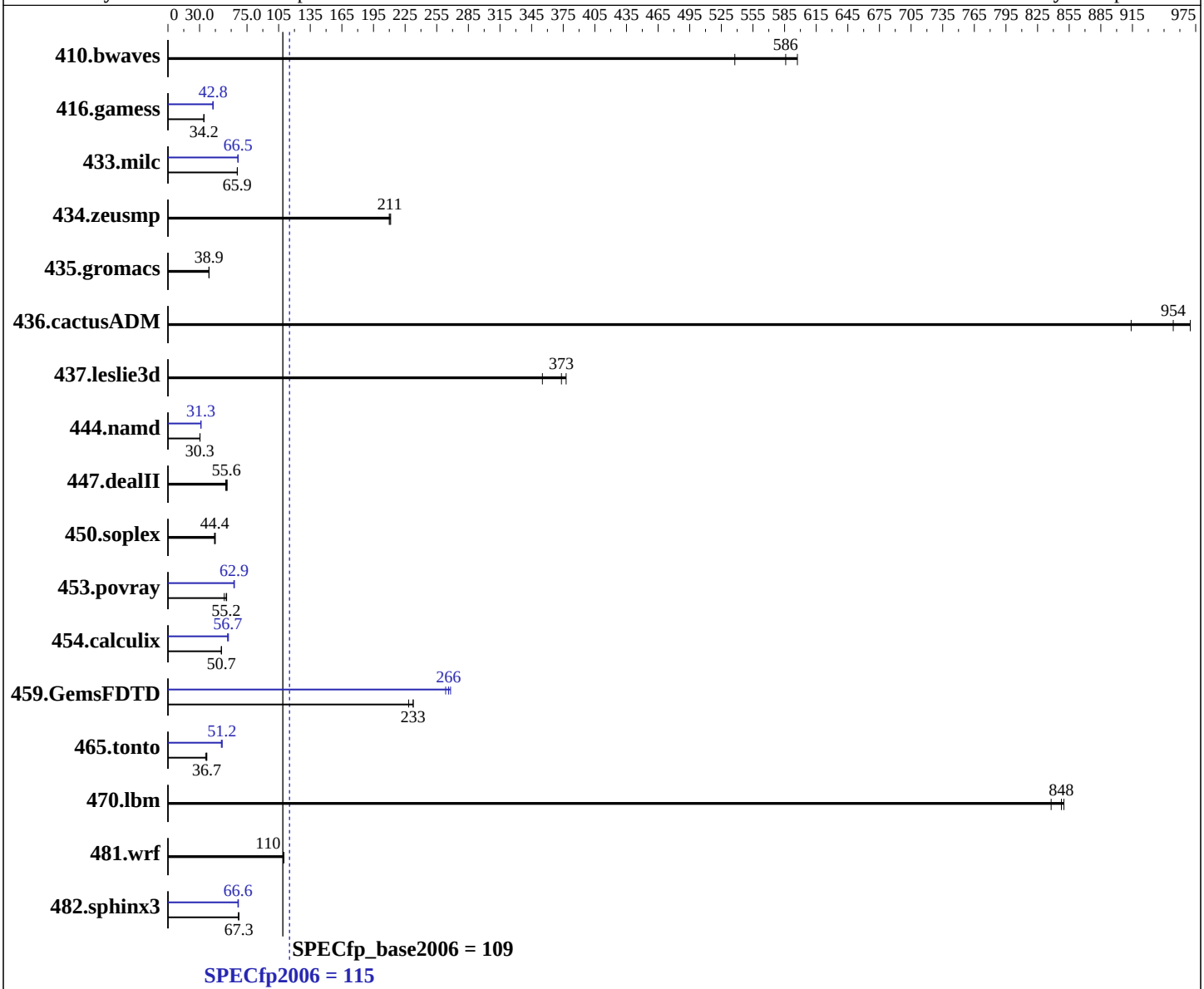
Lenovo System x3550 M5
(Intel Xeon E5-2699 v3, 2.30 GHz)

SPECfp®2006 = 115

SPECfp_base2006 = 109

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

Test date: Jan-2015
Hardware Availability: Oct-2014
Software Availability: Sep-2014



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 300 GB SAS
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	25.3	538	**23.2**	**586**	22.8	597	25.3	538	**23.2**	**586**	22.8	597
416.gamess	576	34.0	572	34.2	**573**	**34.2**	460	42.6	**458**	**42.8**	457	42.9
433.milc	**139**	**65.9**	139	65.9	140	65.7	138	66.3	138	66.5	**138**	**66.5**
434.zeusmp	43.3	210	**43.2**	**211**	43.1	211	43.3	210	**43.2**	**211**	43.1	211
435.gromacs	**183**	**38.9**	183	38.9	183	39.0	**183**	**38.9**	183	38.9	183	39.0
436.cactusADM	12.3	970	13.1	914	**12.5**	**954**	12.3	970	13.1	914	**12.5**	**954**
437.leslie3d	**25.2**	**373**	24.9	378	26.5	355	**25.2**	**373**	24.9	378	26.5	355
444.namd	263	30.5	**264**	**30.3**	264	30.3	256	31.3	256	31.3	**256**	**31.3**
447.dealII	209	54.8	**206**	**55.6**	204	56.2	209	54.8	**206**	**55.6**	204	56.2
450.soplex	188	44.3	186	44.9	**188**	**44.4**	188	44.3	186	44.9	**188**	**44.4**
453.povray	95.5	55.7	**96.3**	**55.2**	99.6	53.4	84.5	62.9	**84.6**	**62.9**	85.1	62.5
454.calculix	163	50.6	**163**	**50.7**	162	50.9	144	57.4	145	56.7	**145**	**56.7**
459.GemsFDTD	46.5	228	**45.6**	**233**	45.6	233	40.3	263	39.6	268	**39.9**	**266**
465.tonto	267	36.9	275	35.8	**268**	**36.7**	191	51.4	**192**	**51.2**	194	50.6
470.lbm	16.4	838	16.2	850	**16.2**	**848**	16.4	838	16.2	850	**16.2**	**848**
481.wrf	102	110	**102**	**110**	101	110	102	110	**102**	**110**	101	110
482.sphinx3	290	67.3	**290**	**67.3**	292	66.7	**293**	**66.6**	291	66.9	293	66.4

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 x3550M5 Sat Jan 10 07:12:13 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:       263452232 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 x3550M5 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 01:44

SPEC is set to: /root/SPECcpu_15
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-root xfs   275G   15G  260G   6% /
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 -[TBE103AUS-1.01]- 10/23/2014
```

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Platform Notes (Continued)

```
      Memory:
       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:
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

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

Continued on next page

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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