



# SPEC® CFP2006 Result

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## Lenovo Group Limited

SPECfp®2006 = 102

Lenovo ThinkServer RS160  
(3.60 GHz, Intel Xeon E3-1270 v5)

SPECfp\_base2006 = 99.6

CPU2006 license: 9017

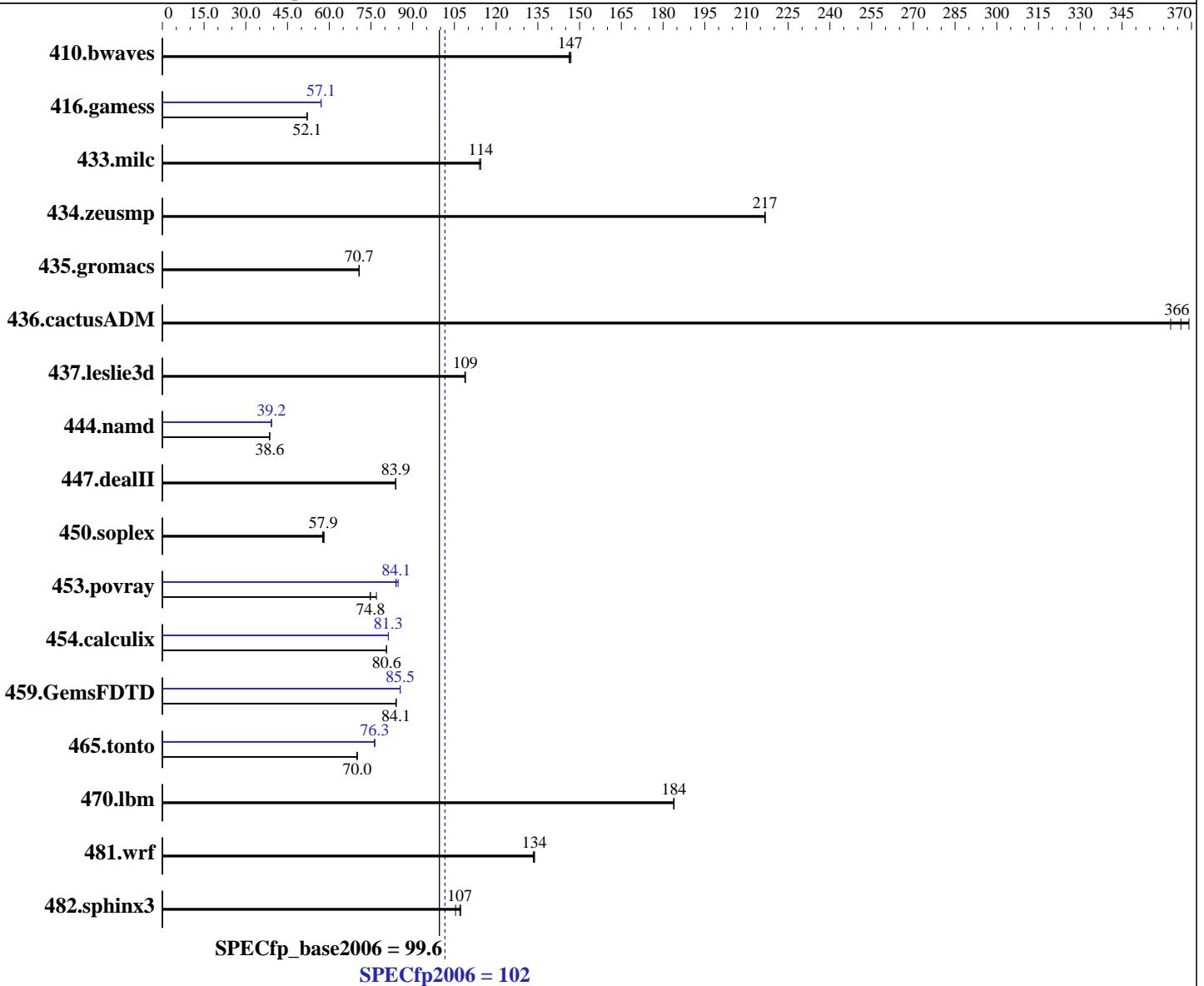
Test date: Nov-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Sep-2016

Tested by: Lenovo Group Limited

Software Availability: Mar-2016



### Hardware

CPU Name: Intel Xeon E3-1270 v5  
 CPU Characteristics: Intel Turbo Boost Technology up to 4.00 GHz  
 CPU MHz: 3600  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip  
 CPU(s) orderable: 1 chip  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

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### Software

Operating System: Red Hat Enterprise Linux Server release 7.2  
 Kernel 3.10.0-327.el7.x86\_64  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: xfs  
 System State: Run level 3 (multi-user)

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L3 Cache: 8 MB I+D on chip per chip  
Other Cache: None  
Memory: 16 GB (2 x 8 GB 2Rx8 PC4-2133P-E)  
Disk Subsystem: 1 x 800 GB SATA SSD  
Other Hardware: None

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	92.9	146	92.5	147	<b>92.7</b>	<b>147</b>	92.9	146	92.5	147	<b>92.7</b>	<b>147</b>
416.gamess	<b>376</b>	<b>52.1</b>	376	52.0	376	52.1	<b>343</b>	<b>57.1</b>	343	57.0	343	57.1
433.milc	80.2	114	<b>80.2</b>	<b>114</b>	80.5	114	80.2	114	<b>80.2</b>	<b>114</b>	80.5	114
434.zeusmp	42.0	217	42.0	217	<b>42.0</b>	<b>217</b>	42.0	217	42.0	217	<b>42.0</b>	<b>217</b>
435.gromacs	101	70.7	<b>101</b>	<b>70.7</b>	101	70.8	101	70.7	<b>101</b>	<b>70.7</b>	101	70.8
436.cactusADM	<b>32.6</b>	<b>366</b>	32.4	369	33.0	363	<b>32.6</b>	<b>366</b>	32.4	369	33.0	363
437.leslie3d	<b>86.3</b>	<b>109</b>	86.3	109	86.4	109	<b>86.3</b>	<b>109</b>	86.3	109	86.4	109
444.namd	208	38.6	208	38.5	<b>208</b>	<b>38.6</b>	<b>204</b>	<b>39.2</b>	204	39.3	205	39.1
447.dealII	136	84.0	<b>136</b>	<b>83.9</b>	137	83.8	136	84.0	<b>136</b>	<b>83.9</b>	137	83.8
450.soplex	143	58.2	145	57.6	<b>144</b>	<b>57.9</b>	143	58.2	145	57.6	<b>144</b>	<b>57.9</b>
453.povray	69.1	77.0	71.2	74.7	<b>71.1</b>	<b>74.8</b>	62.7	84.8	<b>63.3</b>	<b>84.1</b>	63.3	84.0
454.calculix	102	80.6	<b>102</b>	<b>80.6</b>	102	80.6	102	81.2	102	81.3	<b>102</b>	<b>81.3</b>
459.GemsFDTD	<b>126</b>	<b>84.1</b>	126	84.0	126	84.1	<b>124</b>	<b>85.5</b>	124	85.5	124	85.5
465.tonto	140	70.1	<b>140</b>	<b>70.0</b>	141	70.0	<b>129</b>	<b>76.3</b>	129	76.2	129	76.4
470.lbm	74.8	184	<b>74.7</b>	<b>184</b>	74.7	184	74.8	184	<b>74.7</b>	<b>184</b>	74.7	184
481.wrf	<b>83.5</b>	<b>134</b>	83.8	133	83.5	134	<b>83.5</b>	<b>134</b>	83.8	133	83.5	134
482.sphinx3	182	107	<b>182</b>	<b>107</b>	185	105	182	107	<b>182</b>	<b>107</b>	185	105

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"  
Transparent Huge Pages enabled with:  
echo always > /sys/kernel/mm/transparent\_hugepage/enabled

## Platform Notes

BIOS configuration:  
Hyper-Threading set to Disabled  
Boot performance mode set to Turbo Performance  
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on RS160-01 Tue Nov 8 22:33:31 2016

This section contains SUT (System Under Test) info as seen by  
Continued on next page



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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 E3-1270 v5 @ 3.60GHz
  1 "physical id"s (chips)
  4 "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  : 4
    physical 0: cores 0 1 2 3
  cache size : 8192 KB

```

```

From /proc/meminfo
  MemTotal:      16376076 kB
  HugePages_Total:      0
  Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.2 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="7.2"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
    ANSI_COLOR="0;31"
    CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
  redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server

```

```

uname -a:
  Linux RS160-01 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015
  x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Nov 8 18:29

```

SPEC is set to: /home/cpu2006-1.2-ic16.0
  Filesystem      Type      Size      Used Avail Use% Mounted on
  /dev/sda3       xfs       703G      4.0G  699G   1% /home

```

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 LENOVO VB1TS152 09/29/2016

Memory:

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## Platform Notes (Continued)

2x Not Specified Not Specified  
2x Samsung M391A1G43EB1-CPB 8 GB 2 rank 2133 MHz

(End of data from sysinfo program)

## General Notes

Environment variables set by runspec before the start of the run:

KMP\_AFFINITY = "granularity=fine,compact,1,0"

LD\_LIBRARY\_PATH = "/home/cpu2006-1.2-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"

OMP\_NUM\_THREADS = "4"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB  
memory using RedHat EL 7.1

## 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.deallI: -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

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## Base Portability Flags (Continued)

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:

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## Peak Optimization Flags (Continued)

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

### C++ benchmarks:

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

447.dealIII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4  
-ansi-alias

### Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -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:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -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-ic16.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revC.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revC.xml>

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