



SPEC[®] CFP2006 Result

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Lenovo Group Limited

Lenovo ThinkServer TD350
(3.40 GHz, Intel Xeon E5-2643 v4)

SPECfp[®]2006 = 121

SPECfp_base2006 = 117

CPU2006 license: 9017

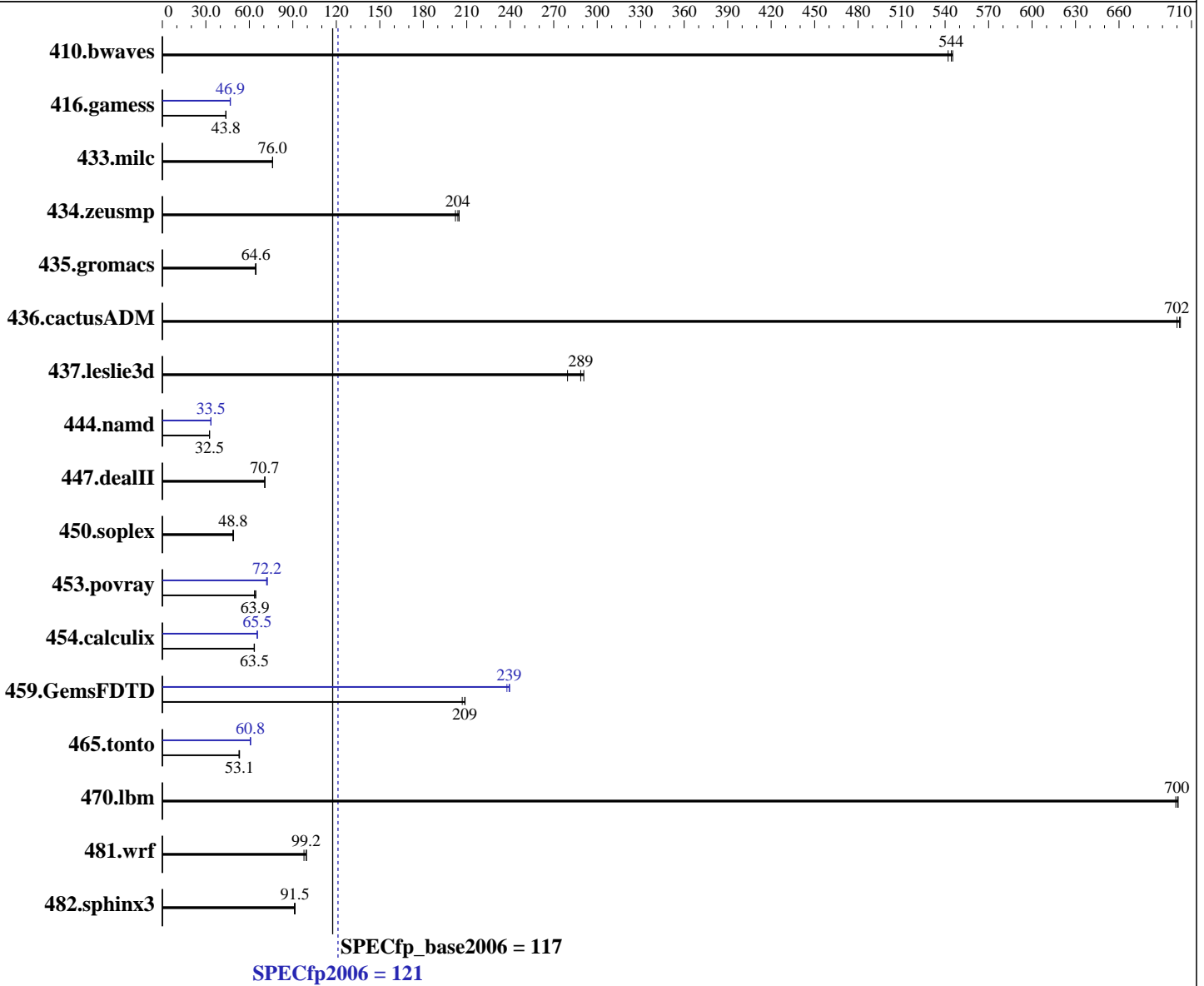
Test sponsor: Lenovo Group Limited

Tested by: Lenovo Group Limited

Test date: Sep-2016

Hardware Availability: Mar-2016

Software Availability: Mar-2016



Hardware

CPU Name: Intel Xeon E5-2643 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
 CPU MHz: 3400
 FPU: Integrated
 CPU(s) enabled: 12 cores, 2 chips, 6 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

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Software

Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64)
 Kernel 3.12.49-11-default
 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: 20 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
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	25.1	542	24.9	545	<u>25.0</u>	<u>544</u>	25.1	542	24.9	545	<u>25.0</u>	<u>544</u>
416.gamess	446	43.9	447	43.8	<u>447</u>	<u>43.8</u>	417	46.9	<u>417</u>	<u>46.9</u>	419	46.8
433.milc	121	76.1	121	76.0	<u>121</u>	<u>76.0</u>	121	76.1	121	76.0	<u>121</u>	<u>76.0</u>
434.zeusmp	<u>44.6</u>	<u>204</u>	44.4	205	45.0	202	<u>44.6</u>	<u>204</u>	44.4	205	45.0	202
435.gromacs	110	64.7	111	64.2	<u>110</u>	<u>64.6</u>	110	64.7	111	64.2	<u>110</u>	<u>64.6</u>
436.cactusADM	17.1	700	<u>17.0</u>	<u>702</u>	17.0	702	17.1	700	<u>17.0</u>	<u>702</u>	17.0	702
437.leslie3d	33.6	280	<u>32.6</u>	<u>289</u>	32.3	291	33.6	280	<u>32.6</u>	<u>289</u>	32.3	291
444.namd	246	32.5	<u>246</u>	<u>32.5</u>	247	32.5	239	33.5	<u>239</u>	<u>33.5</u>	239	33.5
447.dealII	162	70.7	<u>162</u>	<u>70.7</u>	162	70.7	162	70.7	<u>162</u>	<u>70.7</u>	162	70.7
450.soplex	170	49.1	171	48.8	<u>171</u>	<u>48.8</u>	170	49.1	171	48.8	<u>171</u>	<u>48.8</u>
453.povray	83.7	63.6	<u>83.3</u>	<u>63.9</u>	82.4	64.5	73.5	72.4	74.0	71.9	<u>73.6</u>	<u>72.2</u>
454.calculix	130	63.5	<u>130</u>	<u>63.5</u>	130	63.3	<u>126</u>	<u>65.5</u>	126	65.5	126	65.4
459.GemsFDTD	<u>50.9</u>	<u>209</u>	51.3	207	50.8	209	44.3	240	44.6	238	<u>44.4</u>	<u>239</u>
465.tonto	<u>185</u>	<u>53.1</u>	186	52.8	185	53.3	162	60.9	<u>162</u>	<u>60.8</u>	162	60.6
470.lbm	<u>19.6</u>	<u>700</u>	19.7	699	19.6	701	<u>19.6</u>	<u>700</u>	19.7	699	19.6	701
481.wrf	<u>113</u>	<u>99.2</u>	112	99.4	114	97.7	<u>113</u>	<u>99.2</u>	112	99.4	114	97.7
482.sphinx3	<u>213</u>	<u>91.5</u>	214	91.1	213	91.5	<u>213</u>	<u>91.5</u>	214	91.1	213	91.5

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 Configuration:
Hyper-Threading set to Disabled
Cluster On Die set to Disabled
Early Snoop set to Enabled
Performance Profile set to Custom
C1E Support set to Disabled
Core C3 set to Disabled
Core C6 set to Disabled
Thermal Profile set to Max Performance
Memory Power Savings set to Disabled

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Platform Notes (Continued)

Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914
\$Rev: 6914 \$ \$Date:: 2014-06-25 # \$ e3fbb8667b5a285932ceab81e28219e1
running on TD350-03 Tue Sep 13 22:49:46 2016

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 E5-2643 v4 @ 3.40GHz
 2 "physical id"s (chips)
 12 "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 : 6
siblings   : 6
physical 0: cores 0 1 2 3 6 7
physical 1: cores 0 1 2 3 6 7
cache size : 20480 KB
```

From /proc/meminfo

```
MemTotal:      264560632 kB
HugePages_Total: 0
Hugepagesize:   2048 kB
```

From /etc/*release* /etc/*version*

SuSE-release:

```
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 1
```

This file is deprecated and will be removed in a future service pack or release.

Please check /etc/os-release for details about this release.

os-release:

```
NAME="SLES"
VERSION="12-SP1"
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

uname -a:

```
Linux TD350-03 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Sep 13 18:07

SPEC is set to: /home/cpu2006-1.2-ic16.0

```
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4        xfs   689G  8.0G  681G   2% /home
```

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Platform Notes (Continued)

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 TB5TS362 03/24/2016

Memory:

16x Hynix Semiconductor HMA42GR7AFR4N-UH 16 GB 2 rank 2400 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"

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 = "12"

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

Transparent Huge Pages disabled with:

echo never > /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

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Base Portability Flags (Continued)

```

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
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

```



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Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

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.dealII: 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

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Peak Optimization Flags (Continued)

465.tonto (continued):

`-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

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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