



SPEC[®] CFP2006 Result

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Lenovo Group Limited

SPECfp[®]_rate2006 = 889

Lenovo System x3550 M5
(2.00 GHz, Intel Xeon E5-2660 v4)

SPECfp_rate_base2006 = 867

CPU2006 license: 9017

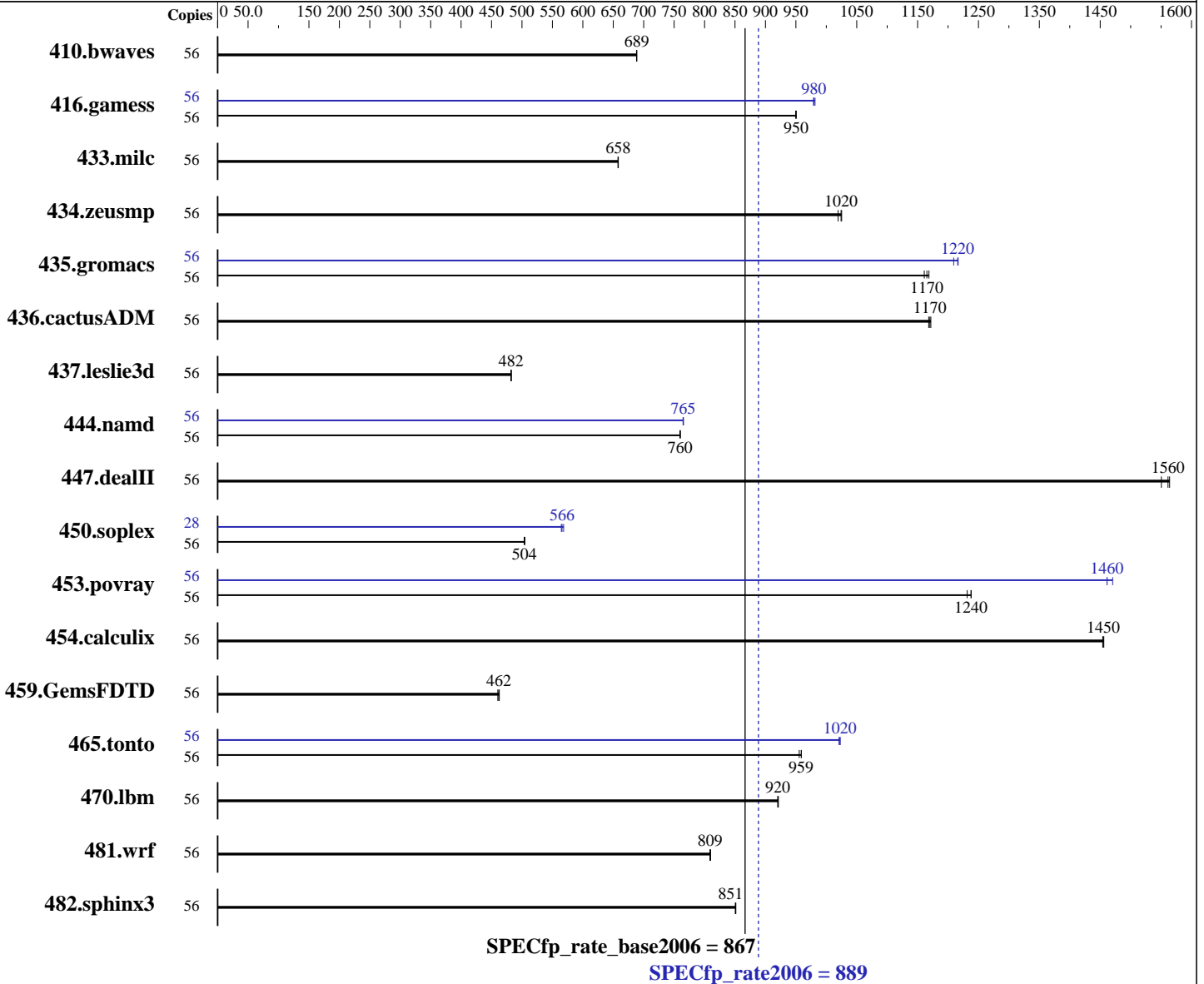
Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015



Hardware

CPU Name: Intel Xeon E5-2660 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
 CPU MHz: 2000
 FPU: Integrated
 CPU(s) enabled: 28 cores, 2 chips, 14 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

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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: No
 File System: xfs
 System State: Run level 3 (multi-user)

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L3 Cache: 35 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: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	56	1105	689	<u>1105</u>	<u>689</u>	1106	688	56	1105	689	<u>1105</u>	<u>689</u>	1106	688
416.gamess	56	<u>1154</u>	<u>950</u>	1154	950	1154	951	56	1120	979	1117	981	<u>1119</u>	<u>980</u>
433.milc	56	<u>781</u>	<u>658</u>	781	658	782	658	56	<u>781</u>	<u>658</u>	781	658	782	658
434.zeusmp	56	<u>498</u>	<u>1020</u>	500	1020	497	1030	56	<u>498</u>	<u>1020</u>	500	1020	497	1030
435.gromacs	56	342	1170	<u>343</u>	<u>1170</u>	344	1160	56	329	1220	<u>329</u>	<u>1220</u>	331	1210
436.cactusADM	56	<u>572</u>	<u>1170</u>	571	1170	573	1170	56	<u>572</u>	<u>1170</u>	571	1170	573	1170
437.leslie3d	56	<u>1092</u>	<u>482</u>	1091	483	1093	482	56	<u>1092</u>	<u>482</u>	1091	483	1093	482
444.namd	56	591	760	<u>591</u>	<u>760</u>	591	760	56	587	765	587	765	<u>587</u>	<u>765</u>
447.dealII	56	410	1560	413	1550	<u>410</u>	<u>1560</u>	56	410	1560	413	1550	<u>410</u>	<u>1560</u>
450.soplex	56	925	505	<u>927</u>	<u>504</u>	927	504	28	<u>413</u>	<u>566</u>	411	568	414	565
453.povray	56	242	1230	<u>241</u>	<u>1240</u>	241	1240	56	<u>204</u>	<u>1460</u>	204	1460	203	1470
454.calculix	56	318	1450	317	1460	<u>318</u>	<u>1450</u>	56	318	1450	317	1460	<u>318</u>	<u>1450</u>
459.GemsFDTD	56	1291	460	<u>1286</u>	<u>462</u>	1284	463	56	1291	460	<u>1286</u>	<u>462</u>	1284	463
465.tonto	56	575	959	577	956	<u>575</u>	<u>959</u>	56	<u>539</u>	<u>1020</u>	540	1020	539	1020
470.lbm	56	<u>836</u>	<u>920</u>	836	920	835	921	56	<u>836</u>	<u>920</u>	836	920	835	921
481.wrf	56	<u>773</u>	<u>809</u>	773	809	772	810	56	<u>773</u>	<u>809</u>	773	809	772	810
482.sphinx3	56	<u>1282</u>	<u>851</u>	1283	850	1282	851	56	<u>1282</u>	<u>851</u>	1283	850	1282	851

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"
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1 > /proc/sys/vm/drop_caches



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Test date: Jun-2016

Hardware Availability: Mar-2016

Software Availability: Dec-2015

Platform Notes

BIOS Configuration:

Operating Mode set to "Maximum Performance"

COD Preference set to Enable

Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1

running on DaAn-03 Sat Jun 4 19:43:46 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 E5-2660 v4@ 2.00GHz

2 "physical id"s (chips)

56 "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 : 14

siblings : 28

physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

cache size : 17920 KB

From /proc/meminfo

MemTotal: 263825132 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 DaAn-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 Jun 4 07:44

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Platform Notes (Continued)

SPEC is set to: /home/cpu2006-1.2-ic16.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 689G 28G 662G 5% /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 -[TBE124K-2.10]- 05/10/2016
Memory:
16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 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 = "/home/cpu2006-1.2-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/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



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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
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 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

```

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Peak Compiler Invocation (Continued)

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
 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: -D_FILE_OFFSET_BITS=64
 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: 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) -opt-mem-layout-trans=3(pass 2)
 -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

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Peak Optimization Flags (Continued)

450.soplex: -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) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -opt-malloc-options=3

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) -opt-mem-layout-trans=3(pass 2)
-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: basepeak = yes

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

Benchmarks using both Fortran and C:

435.gromacs: -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) -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: 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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