



SPEC[®] CFP2006 Result

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Lenovo Group Limited

SPECfp[®]_rate2006 = 3840

Lenovo System x3950 X6
(Intel Xeon E7-8880 v3, 2.30 GHz)

SPECfp_rate_base2006 = 3770

CPU2006 license: 9017

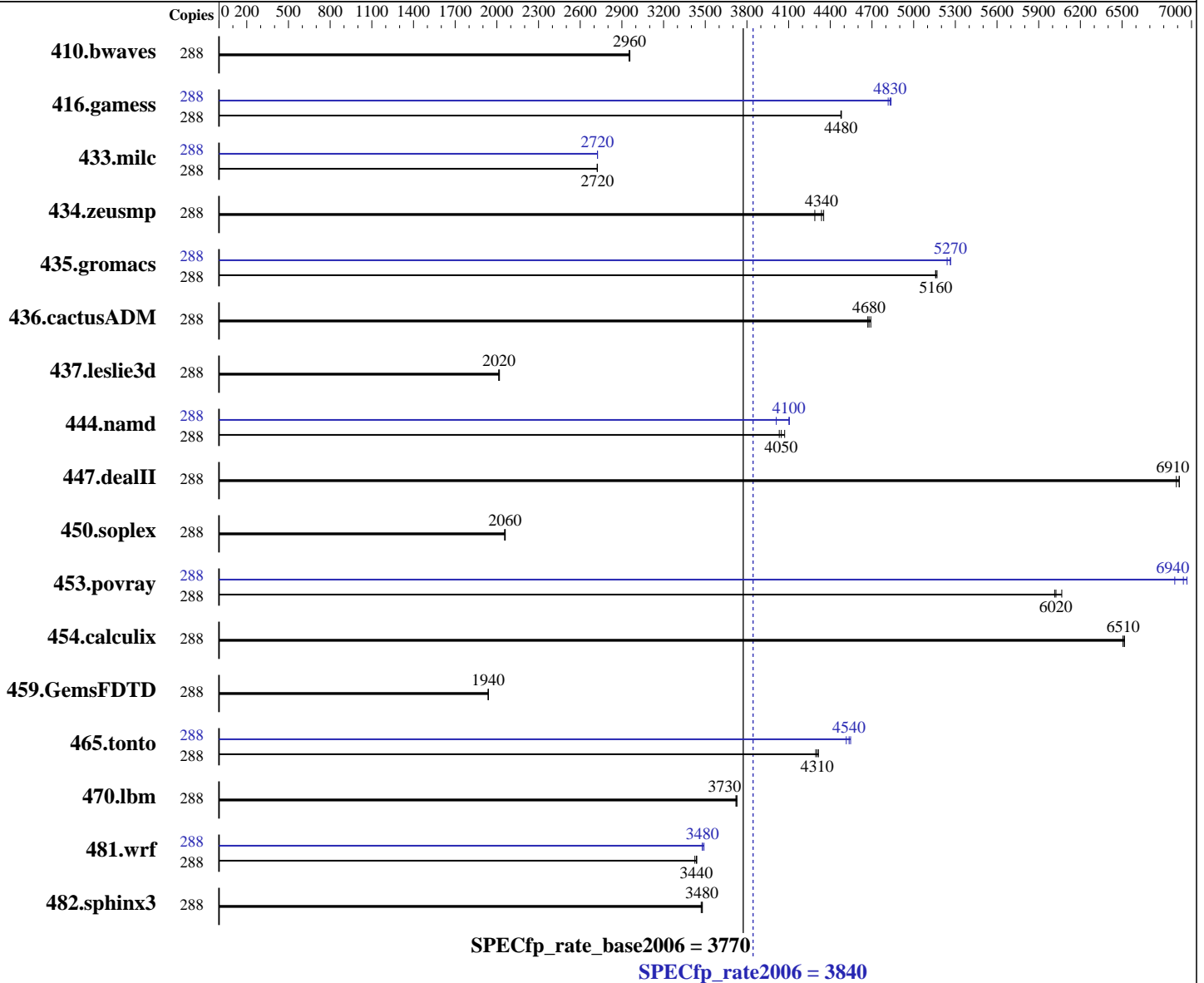
Test date: Jan-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jul-2015

Tested by: Lenovo Group Limited

Software Availability: Oct-2014



Hardware

CPU Name: Intel Xeon E7-8880 v3
 CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz
 CPU MHz: 2300
 FPU: Integrated
 CPU(s) enabled: 144 cores, 8 chips, 18 cores/chip, 2 threads/core
 CPU(s) orderable: 4, 6, 8 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 (x86_64)
 3.12.28-4-default
 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: No
 File System: xfs
 System State: Run level 3 (multi-user)

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L3 Cache: 45 MB I+D on chip per chip
Other Cache: None
Memory: 2 TB (128 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem: 1 x 400 GB 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	288	1324	2960	1323	2960	1326	2950	288	1324	2960	1323	2960	1326	2950		
416.gamess	288	1260	4480	1260	4480	1259	4480	288	1167	4830	1166	4840	1171	4820		
433.milc	288	971	2720	971	2720	971	2720	288	970	2720	970	2720	971	2720		
434.zeusmp	288	602	4350	611	4290	604	4340	288	602	4350	611	4290	604	4340		
435.gromacs	288	398	5160	399	5160	398	5170	288	391	5270	392	5240	391	5270		
436.cactusADM	288	737	4670	736	4680	734	4690	288	737	4670	736	4680	734	4690		
437.leslie3d	288	1341	2020	1345	2010	1343	2020	288	1341	2020	1345	2010	1343	2020		
444.namd	288	567	4070	573	4030	571	4050	288	563	4110	563	4100	576	4010		
447.dealII	288	477	6910	477	6910	478	6890	288	477	6910	477	6910	478	6890		
450.soplex	288	1166	2060	1167	2060	1169	2060	288	1166	2060	1167	2060	1169	2060		
453.povray	288	254	6020	255	6010	253	6070	288	223	6880	220	6970	221	6940		
454.calculix	288	365	6510	365	6520	365	6510	288	365	6510	365	6520	365	6510		
459.GemsFDTD	288	1577	1940	1577	1940	1575	1940	288	1577	1940	1577	1940	1575	1940		
465.tonto	288	657	4310	660	4300	658	4310	288	623	4550	625	4540	628	4510		
470.lbm	288	1064	3720	1062	3730	1061	3730	288	1064	3720	1062	3730	1061	3730		
481.wrf	288	935	3440	936	3440	939	3430	288	922	3490	924	3480	925	3480		
482.sphinx3	288	1615	3480	1617	3470	1613	3480	288	1615	3480	1617	3470	1613	3480		

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"

Platform Notes

Operating Mode set to Custom in BIOS
Cstates disabled in BIOS
Sysinfo program /cpu2006.1.2/config/sysinfo.rev6914
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Platform Notes (Continued)

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1
running on linux-lea3 Sat Jan 23 14:03:11 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 E7-8880 v3 @ 2.30GHz
 8 "physical id"s (chips)
288 "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  : 36
  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
  physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  physical 4: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  physical 5: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  physical 6: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  physical 7: 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:      2117726352 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

/usr/bin/lsb_release -d

SUSE Linux Enterprise Server 12

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

```

SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 0
  # 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"
  VERSION_ID="12"
  PRETTY_NAME="SUSE Linux Enterprise Server 12"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12"

```

uname -a:

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Platform Notes (Continued)

Linux linux-lea3 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
(9879bd4) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 23 00:43 last=5

SPEC is set to: /cpu2006.1.2

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda3	xfs	371G	8.3G	363G	3%	/

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 -[A9E125JUS-2.00]- 06/18/2015

Memory:

126x Hynix HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1600 MHz
2x Hynix HMA42GR7MFR4N-TFTD 16 GB 2 rank 2133 MHz, configured at 1600 MHz
64x 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 = "/cpu2006.1.2/libs/32:/cpu2006.1.2/libs/64:/cpu2006.1.2/sh"

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

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

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Base Compiler Invocation (Continued)

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
 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

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Peak Compiler Invocation (Continued)

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)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
-auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias
-auto-ilp32

447.dealIII: 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)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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Peak Optimization Flags (Continued)

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: basepeak = yes

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

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2)
-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: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

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-CC.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-CC.xml>

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