Lenovo Group Limited

Lenovo ThinkServer SD350
(1.70 GHz, Intel Xeon E5-2603 v4)

**SPECint_rate2006 = 328**

**SPECint_rate_base2006 = 313**

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<td>483.xalancbmk</td>
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</table>

**Hardware**

- **CPU Name:** Intel Xeon E5-2603 v4
- **CPU Characteristics:**
  - **CPU MHz:** 1700
  - **FPU:** Integrated
  - **CPU(s) enabled:** 12 cores, 2 chips, 6 cores/chip
  - **Primary Cache:** 32 KB I + 32 KB D on chip per core
  - **Secondary Cache:** 256 KB I+D on chip per core
  - **L3 Cache:** 15 MB I+D on chip per chip
  - **Memory:** 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 1866 MHz)
  - **Disk Subsystem:** 1 x 800 GB SATA SSD
  - **Other Cache:** None

**Software**

- **Operating System:** SUSE Linux Enterprise Server 12 SP1 (x86_64)
  - Kernel 3.12.49-11-default
- **Compiler:** C/C++: Version 17.0.0.0.098 of Intel C/C++ Compiler for Linux
- **Auto Parallel:** No
- **File System:** btrfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 32-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** Microquill SmartHeap V10.2
Lenovo Group Limited

Lenovo ThinkServer SD350
(1.70 GHz, Intel Xeon E5-2603 v4)

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

SPECint_rate2006 = 328
SPECint_rate_base2006 = 313

Results Table

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<td>446</td>
</tr>
</tbody>
</table>

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/swap

Platform Notes
BIOS configuration:
DCU Streamer Prefetcher set to Disable
Sysinfo program /home/cpu2006-1.2-ic17.0/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on Kent-SUT1 Wed Jan 13 06:57:39 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 E5-2603 v4@ 1.70GHz
   2 "physical id"s (chips)
Lenovo Group Limited
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Platform Notes (Continued)

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 4 5
  physical 1: cores 0 1 2 3 4 5
  cache size : 15360 KB

From /proc/meminfo
MemTotal: 264572516 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-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:
  (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 13 06:55

SPEC is set to: /home/cpu2006-1.2-ic17.0

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 American Megatrends Inc. 3.57 08/12/2016
Memory:
  16x Samsung M393A2G40DB1-CRC 16 GB 2 rank 2400 MHz, configured at 1866 MHz

Continued on next page
Lenovo Group Limited
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Test date: Jan-2017
Hardware Availability: Sep-2016
Software Availability: Sep-2016

Platform Notes (Continued)

(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-ic17.0/libs/32:/home/cpu2006-1.2-ic17.0/libs/64:/home/cpu2006-1.2-ic17.0/sh10.2

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.2
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Base Compiler Invocation

C benchmarks:
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
C++ benchmarks:
icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

Base Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64  -DSPEC_CPU_LINUX_IA32
401.bzip2: -D_FILE_OFFSET_BITS=64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -D_FILE_OFFSET_BITS=64
458.sjeng: -D_FILE_OFFSET_BITS=64
462.libquantum: -D_FILE_OFFSET_BITS=64  -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64  -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap
## Lenovo Group Limited

**Lenovo ThinkServer SD350**

(1.70 GHz, Intel Xeon E5-2603 v4)

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</table>

### Base Other Flags

C benchmarks:

403.gcc: `-Dalloca=_alloca`

### Peak Compiler Invocation

C benchmarks (except as noted below):

```bash
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

400.perlbench: `icc` -m64

401.bzip2: `icc` -m64

456.hmmer: `icc` -m64

458.sjeng: `icc` -m64

C++ benchmarks:

```bash
icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

### Peak Portability Flags

400.perlbench: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`

401.bzip2: `-DSPEC_CPU_LP64`

403.gcc: `-D_FILE_OFFSET_BITS=64`

429.mcf: `-D_FILE_OFFSET_BITS=64`

445.gobmk: `-D_FILE_OFFSET_BITS=64`

456.hmmer: `-DSPEC_CPU_LP64`

458.sjeng: `-DSPEC_CPU_LP64`

462.libquantum: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`

464.h264ref: `-D_FILE_OFFSET_BITS=64`

471.omnetpp: `-D_FILE_OFFSET_BITS=64`

473.astar: `-D_FILE_OFFSET_BITS=64`

483.xalancbmk: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`

### Peak Optimization Flags

C benchmarks:

400.perlbench: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -03(pass 2)
-no-prec-div(pass 2) -auto-ilp32 -qopt-mem-layout-trans=3`
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CPU2006 license: 9017
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Test date: Jan-2017
Hardware Availability: Sep-2016
Software Availability: Sep-2016

Peak Optimization Flags (Continued)

401.bzip2: --prof-gen(pass 1) --prof-use(pass 2) --xCORE-AVX2(pass 2)
-parallel-num-threads=1(pass 1) --ipo(pass 2) --O3(pass 2)
-no-prec-div(pass 2) --qopt-prefetch --auto-ilp32
--qopt-mem-layout-trans=3

403.gcc: --xCORE-AVX2 --ipo --O3 --no-prec-div
--qopt-mem-layout-trans=3

429.mcf: basepeak = yes

445.gobmk: --prof-gen(pass 1) --prof-use(pass 2) --xCORE-AVX2(pass 2)
-parallel-num-threads=1(pass 1) --ipo(pass 2) --O3(pass 2)
-no-prec-div(pass 2) --qopt-mem-layout-trans=3

456.hmmer: --xCORE-AVX2 --ipo --O3 --no-prec-div --unroll2 --auto-ilp32
--qopt-mem-layout-trans=3

458.sjeng: --prof-gen(pass 1) --prof-use(pass 2) --xCORE-AVX2(pass 2)
-parallel-num-threads=1(pass 1) --ipo(pass 2) --O3(pass 2)
-no-prec-div(pass 2) --unroll4 --auto-ilp32
--qopt-mem-layout-trans=3

462.libquantum: basepeak = yes

464.h264ref: --prof-gen(pass 1) --prof-use(pass 2) --xCORE-AVX2(pass 2)
-parallel-num-threads=1(pass 1) --ipo(pass 2) --O3(pass 2)
-no-prec-div(pass 2) --unroll2 --qopt-mem-layout-trans=3

C++ benchmarks:

471.omnetpp: --prof-gen(pass 1) --prof-use(pass 2) --xCORE-AVX2(pass 2)
-parallel-num-threads=1(pass 1) --ipo(pass 2) --O3(pass 2)
-no-prec-div(pass 2)
-qopt-ra-region-strategy=block
-qopt-mem-layout-trans=3 -Wl,-z,muldefs
-L/sh10.2 -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca
**SPEC CINT2006 Result**

**Lenovo Group Limited**

Lenovo ThinkServer SD350  
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CPU2006 license: 9017  
Test sponsor: Lenovo Group Limited  
Tested by: Lenovo Group Limited

Test date: Jan-2017  
Hardware Availability: Sep-2016  
Software Availability: Sep-2016

The flags files that were used to format this result can be browsed at:

[http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html](http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html)

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

[http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml](http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml)
[http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revE.xml](http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revE.xml)

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