# SPEC® CINT2006 Result

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## Lenovo Group Limited

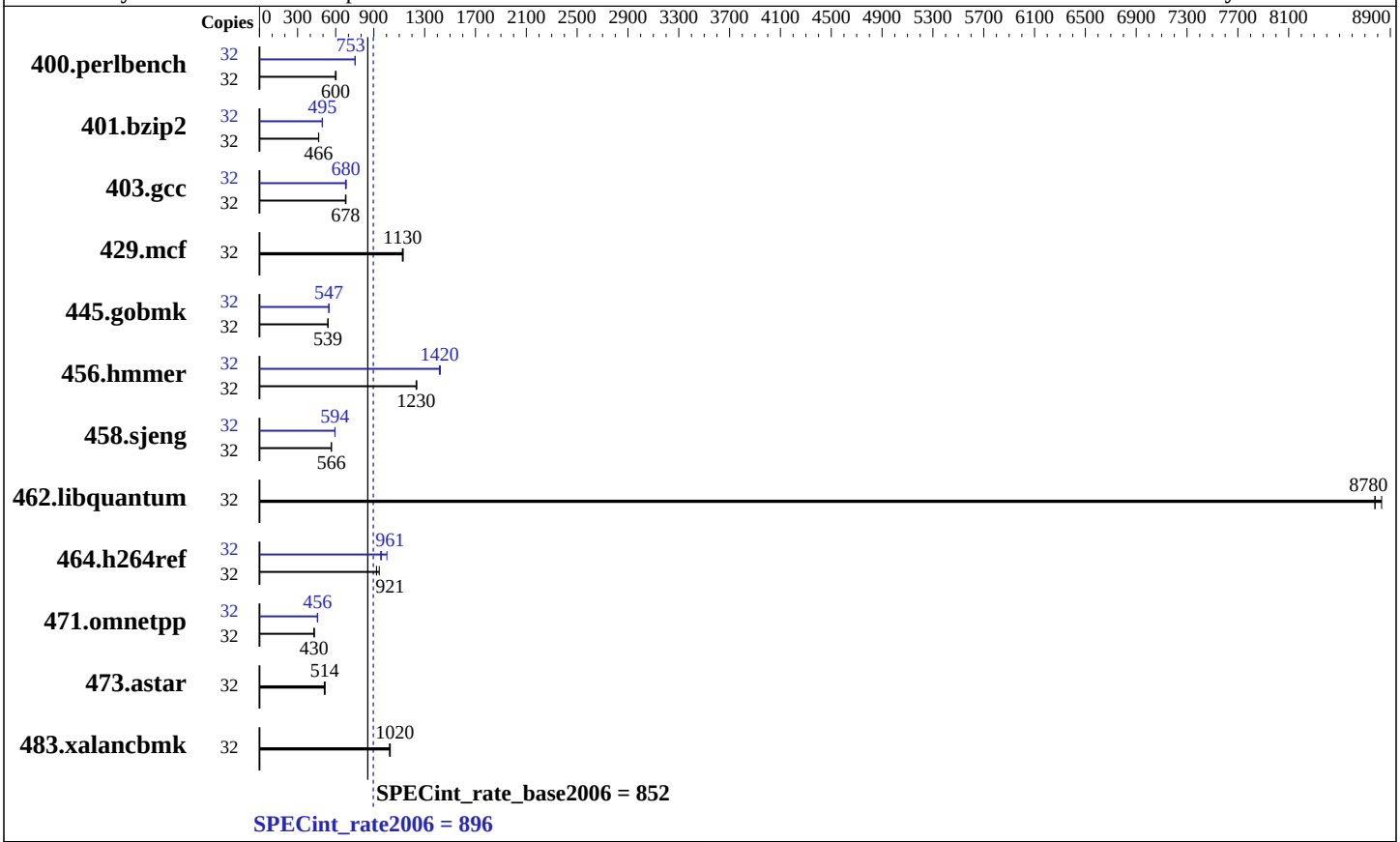
Lenovo System x3850 X6
(Intel Xeon E7-8893 v3, 3.20 GHz)

SPECint®_rate2006 = 896

SPECint_rate_base2006 = 852

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

**Test date:** Jun-2015
**Hardware Availability:** Jul-2015
**Software Availability:** Oct-2014




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-8893 v3 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.50 GHz |
| CPU MHz: | 3200 |
| FPU: | Integrated |
| CPU(s) enabled: | 16 cores, 4 chips, 4 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2,4 chips |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |
| L3 Cache: | 45 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 1 TB (64 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz) |
| Disk Subsystem: | 1 x 400 GB SSD |
| Other Hardware: | None |

## Software

| | |
|---|---|
| Operating System: | SUSE Linus 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 |
| Auto Parallel: | No |
| File System: | xfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 32-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | Microquill SmartHeap V10.0 |

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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 32 | 518 | 603 | **521** | **600** | 523 | 598 | 32 | 415 | 753 | **415** | **753** | 415 | 754 |
| 401.bzip2 | 32 | 664 | 465 | **663** | **466** | 663 | 466 | 32 | 626 | 494 | **624** | **495** | 622 | 496 |
| 403.gcc | 32 | 381 | 677 | 378 | 681 | **380** | **678** | 32 | **379** | **680** | 377 | 683 | 381 | 677 |
| 429.mcf | 32 | 259 | 1130 | **259** | **1130** | 258 | 1130 | 32 | 259 | 1130 | **259** | **1130** | 258 | 1130 |
| 445.gobmk | 32 | 623 | 539 | 622 | 539 | **623** | **539** | 32 | 613 | 547 | 615 | 546 | **614** | **547** |
| 456.hmmer | 32 | 241 | 1240 | **242** | **1230** | 242 | 1230 | 32 | 211 | 1420 | 210 | 1420 | **210** | **1420** |
| 458.sjeng | 32 | 685 | 565 | **684** | **566** | 684 | 566 | 32 | **652** | **594** | 652 | 594 | 652 | 594 |
| 462.libquantum | 32 | **75.5** | **8780** | 75.5 | 8780 | 75.1 | 8830 | 32 | **75.5** | **8780** | 75.5 | 8780 | 75.1 | 8830 |
| 464.h264ref | 32 | 751 | 943 | **769** | **921** | 769 | 921 | 32 | **737** | **961** | 706 | 1000 | 743 | 953 |
| 471.omnetpp | 32 | 465 | 430 | **465** | **430** | 464 | 431 | 32 | 437 | 457 | **438** | **456** | 438 | 456 |
| 473.astar | 32 | 436 | 515 | 440 | 510 | **437** | **514** | 32 | 436 | 515 | 440 | 510 | **437** | **514** |
| 483.xalancbmk | 32 | 214 | 1030 | 215 | 1020 | **215** | **1020** | 32 | 214 | 1030 | 215 | 1020 | **215** | **1020** |

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 /home/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-w3yn Mon Jun 15 14:04:55 2015

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 E7-8893 v3 @ 3.20GHz
      4 "physical id"s (chips)
      32 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
```

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## Platform Notes (Continued)

```
        cpu cores : 4
        siblings  : 8
        physical 0: cores 1 5 16 20
        physical 1: cores 1 5 16 20
        physical 2: cores 1 5 16 20
        physical 3: cores 1 5 16 20
     cache size : 46080 KB

  From /proc/meminfo
     MemTotal:       1058536028 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:
     Linux linux-w3yn 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 5 Jun 15 11:23

  SPEC is set to: /home/cpu2006
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda4      xfs   331G  276G   55G  84% /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 IBM -[A9E121SUS-1.00]- 03/13/2015
    Memory:
     64x Hynix HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1600 MHz
```

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## Platform Notes (Continued)

```
     32x 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/libs/32:/home/cpu2006/libs/64:/home/cpu2006/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 -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

C++ benchmarks:

```
icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

# Base Portability Flags

400.perlbench: `-DSPEC_CPU_LINUX_IA32`
462.libquantum: `-DSPEC_CPU_LINUX`
483.xalancbmk: `-DSPEC_CPU_LINUX`

# Base Optimization Flags

C benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -lsmartheap
```

## Base Other Flags

C benchmarks:

403.gcc: `-Dalloca=_alloca`

## Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32`

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

C++ benchmarks:
`icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32`

## Peak Portability Flags

400.perlbench: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-DSPEC_CPU_LP64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LINUX`
483.xalancbmk: `-DSPEC_CPU_LINUX`

## Peak Optimization Flags

C benchmarks:

400.perlbench: `-xCORE-AVX2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-auto-ilp32`

401.bzip2: `-xCORE-AVX2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-opt-prefetch -auto-ilp32 -ansi-alias`

403.gcc: `-xCORE-AVX2 -ipo -O3 -no-prec-div`

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# Peak Optimization Flags (Continued)

429.mcf: basepeak = yes

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2) -ansi-alias -opt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -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-ilp32

462.libquantum: basepeak = yes

464.h264ref: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -ansi-alias

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs -L/sh -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

# Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

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/Default-Platform-Flags.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/Default-Platform-Flags.xml

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