# Lenovo Group Limited

## SPECint®_rate2006 = 673

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64</td>
<td>CPU Name: Intel Xeon E5-2618L v3</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux</td>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz</td>
</tr>
<tr>
<td>Auto Parallel: No</td>
<td>CPU MHz: 2300</td>
</tr>
<tr>
<td>File System: xfs</td>
<td>FPU: Integrated</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>Base Pointers: 32-bit</td>
<td>CPU(s) orderable: 1.2 chips</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Other Software: Microquill SmartHeap V10.0</td>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
</tr>
<tr>
<td>Disk Subsystem: 256 GB (16 x 16 GB 2Rxs4 PC4-2133P-R, running at 1866 MHz)</td>
<td>L3 Cache: 20 MB I+D on chip per chip</td>
</tr>
</tbody>
</table>

## Lenovo Group Limited

System Model Name: Lenovo System x3650 M5 (Intel Xeon E5-2618L v3, 2.30 GHz)

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Test date: Apr-2015

Tested by: Lenovo Group Limited
Hardware Availability: Oct-2014

### System State:
Run level 3 (multi-user)

### Base Pointers:
32-bit

### Peak Pointers:
32/64-bit

### Other Software:
- Microquill SmartHeap V10.0
- Other Software: None

### Disk Subsystem:
- 256 GB (16 x 16 GB 2Rxs4 PC4-2133P-R, running at 1866 MHz)
- Other Hardware: None

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### Hardware

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<tbody>
<tr>
<td>32</td>
<td>CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core</td>
<td>CPU(s) orderable: 1.2 chips</td>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
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<tr>
<td></td>
<td>Other Cache: None</td>
<td>Memory: 256 GB (16 x 16 GB 2Rxs4 PC4-2133P-R, running at 1866 MHz)</td>
<td>Disk Subsystem: 1 x 1000 GB SATA, 7200 RPM</td>
<td>Other Hardware: None</td>
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</table>

### Software

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<th>Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64</th>
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**Lenovo Group Limited**

System Model Name: Lenovo System x3650 M5 (Intel Xeon E5-2618L v3, 2.30 GHz)

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Test date: Apr-2015

Tested by: Lenovo Group Limited
Hardware Availability: Oct-2014

### System State:
Run level 3 (multi-user)

### Base Pointers:
32-bit

### Peak Pointers:
32/64-bit

### Other Software:
- Microquill SmartHeap V10.0
- Other Software: None

### Disk Subsystem:
- 256 GB (16 x 16 GB 2Rxs4 PC4-2133P-R, running at 1866 MHz)
- Other Hardware: None
Lenovo Group Limited

System Model Name
Lenovo System x3650 M5
(Intel Xeon E5-2618L v3, 2.30 GHz)

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

SPEC CINT2006 Result

SPECint_rate2006 = 673
SPECint_rate_base2006 = 646

Results Table

<table>
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</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"

Platform Notes

BIOS setting:
Operating Mode set to "Efficiency-Favor Performance"
Sysinfo program /SPECcpu/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on x3650M5 Thu Apr 30 05:14:11 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 E5-2618L v3 @ 2.30GHz
 2 "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.)
Lenovo Group Limited

System Model Name: Lenovo System x3650 M5  
(System Xeon E5-2618L v3, 2.30 GHz)

**SPEC CINT2006 Result**

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>673</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>646</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 9017  
**Test date:** Apr-2015  
**Test sponsor:** Lenovo Group Limited  
**Hardware Availability:** Oct-2014  
**Tested by:** Lenovo Group Limited

**Software Availability:** Sep-2014

**Platform Notes (Continued)**

- cpu cores : 8  
- siblings : 16  
- physical 0: cores 0 1 2 3 4 5 6 7  
- physical 1: cores 0 1 2 3 4 5 6 7

From /proc/meminfo
- MemTotal: 263584060 kB  
- HugePages_Total: 0  
- Hugepagesize: 2048 kB

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

- os-release:
  - NAME="Red Hat Enterprise Linux Server"  
  - VERSION="7.0 (Maipo)"  
  - ID="rhel"  
  - ID_LIKE="fedora"  
  - VERSION_ID="7.0"  
  - PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
  - ANSI_COLOR="0;31"  
  - CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"

- Red Hat Enterprise Linux Server release 7.0 (Maipo)  
- system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)  
- system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

- uname -a:
  - Linux x3650M5 3.10.0-123.e17.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014 x86_64  
  - x86_64 x86_64 GNU/Linux

- SPEC is set to: /SPECcpu
- Filesystem Type Size Used Avail Use% Mounted on
- /dev/sda2 xfs 239G 16G 223G 7% /

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 -[TCE103EUS-1.01]- 10/21/2014
- Memory:
  - 16x Hynix 484D413342752374D4652344E2D54462020 16 GB 2 rank 2133 MHz, configured at 1866 MHz
  - 8x NO DIMM Unknown

(End of data from sysinfo program)
**Lenovo Group Limited**

**System Model Name**: Lenovo System x3650 M5  
**CPU**: Intel Xeon E5-2618L v3, 2.30 GHz  

| **CPU2006 license** | Lenovo Group Limited  
| **Tested by** | Lenovo Group Limited  

**SPECint_rate2006** = 673  
**SPECint_rate_base2006** = 646  

**General Notes**

Environment variables set by runspec before the start of the run:  
```
LD_LIBRARY_PATH = "/SPECcpu/1ibs/32:/SPECcpu/1ibs/64:/SPECcpu/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  
  ```

- **C++ benchmarks**:
  ```  
  -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs -L/sh -lsmartheap  
  ```

**Base Other Flags**

- **C benchmarks**:
  ```  
  403.gcc: -Dalloca=_alloca  
  ```
Lenovo Group Limited

SPECint_rate2006 = 673
SPECint_rate_base2006 = 646

Test date: Apr-2015
Hardware Availability: Oct-2014
Software Availability: Sep-2014

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

Peak Compiler Invocation

C benchmarks (except as noted below):

```bash
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:

```bash
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:

```bash
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
- 429.mcf: basepeak = yes
- 445.gobmk: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2) -ansi-alias
- 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

Continued on next page
Peak Optimization Flags (Continued)

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/Lenovo-Platform-Flags-V1.2-HSW-B.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-B.xml

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For other inquiries, please contact webmaster@spec.org.

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