

SENG 462 Tutorial #4

Chris Pearson
pearson@csc.uvic.ca



University
of Victoria

Today

- ▶ MySQL, etc
- ▶ Repeat:
 - Workload files
 - Log files
- ▶ Your questions



Database Files

- ▶ Don't use your group account directories
 - They're served from the network
- ▶ Use `/tmp`
 - That's local to the machine you're using
 - A temporary location does not matter
 - Database should be empty at the start of a trial
 - You can dump the database to a file if needed
 - eg: `mysqldump`



Database Options

▶ SQLite

- Fast configuration
- Good for the one user workload file

▶ PostgreSQL

- <http://www.faqs.org/docs/ppbook/x486.htm>

▶ MySQL

- Get a pre-built version
 - <http://bitnami.org/stack/lampstack>
 - LAMP (Linux Apache MySQL PHP)
- Build your own



Building MySQL

► Build and install:

- `CFLAGS="-O3" CXX=gcc CXXFLAGS="-O3 -felide-constructors -fno-exceptions -fno-rtti"`
- `./configure --prefix=/home/sstudent/local/mysql --enable-asm-asm --with-mysqld-user=sstudent --with-unix-socket-path=/home/sstudent/local/mysql/tmp/mysql.sock --localstatedir=/home/sstudent/local/mysql/data`
- `make`
- `make install`



MySQL: Edit `mysql/my.cnf`

```
[mysqld]
user=sstudent
basedir=/home/sstudent/local/mysql
datadir=/home/sstudent/local/mysql/data
port=3307
socket=/home/sstudent/local/mysql/tmp/mysql.sock

[mysqld_safe]
log-error=/home/sstudent/local/mysql/log/mysqld.log
pid-file=/home/sstudent/local/mysql/mysqld.pid

[client]
port=3307
user=sstudent
socket=/home/sstudent/local/mysql/tmp/mysql.sock

[mysqladmin]
user=root
port=3307
socket=/home/sstudent/local/mysql/tmp/mysql.sock

[mysql]
port=3307
socket=/home/sstudent/local/mysql/tmp/mysql.sock

[mysql_install_db]
user=sstudent
port=3307
basedir=/home/sstudent/local/mysql
datadir=/home/sstudent/local/mysql/data
socket=/home/sstudent/local/mysql/tmp/mysql.sock
```

Change:

- ▶ `sstudent` to your group's user name
- ▶ port number to something in your port number range
- ▶ both `datadir` references to something in `/tmp`



MySQL: Initialize

- ▶ **Create database files:**

- `/home/sstudent/local/mysql/bin/mysql_install_db`

- ▶ **Set a root password:**

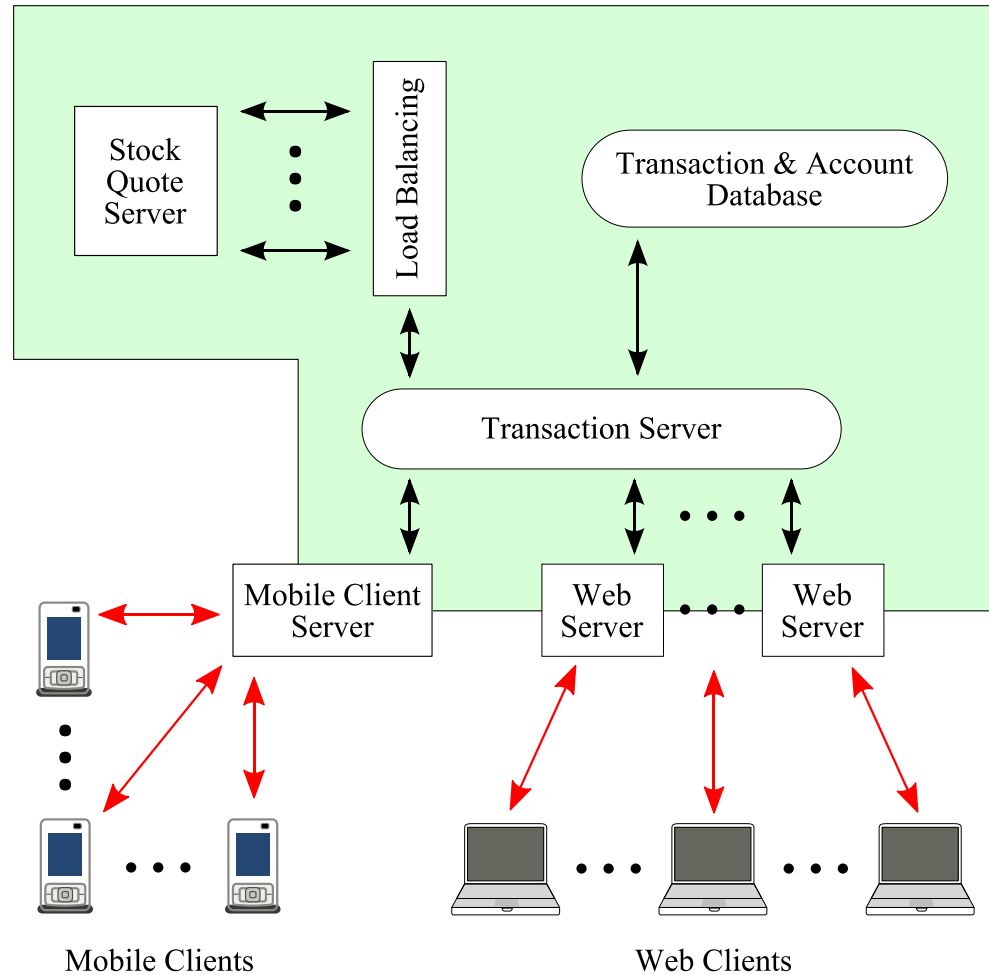
- `/home/sstudent/local/mysql/bin/mysqladmin -u root password 'new_password' mysql -u root -P 33307 -p`

- ▶ **Test the database:**

- `/home/sstudent/local/mysql/bin/mysqld_safe --defaults-file=/home/sstudent/local/mysql/my.cnf`



The System

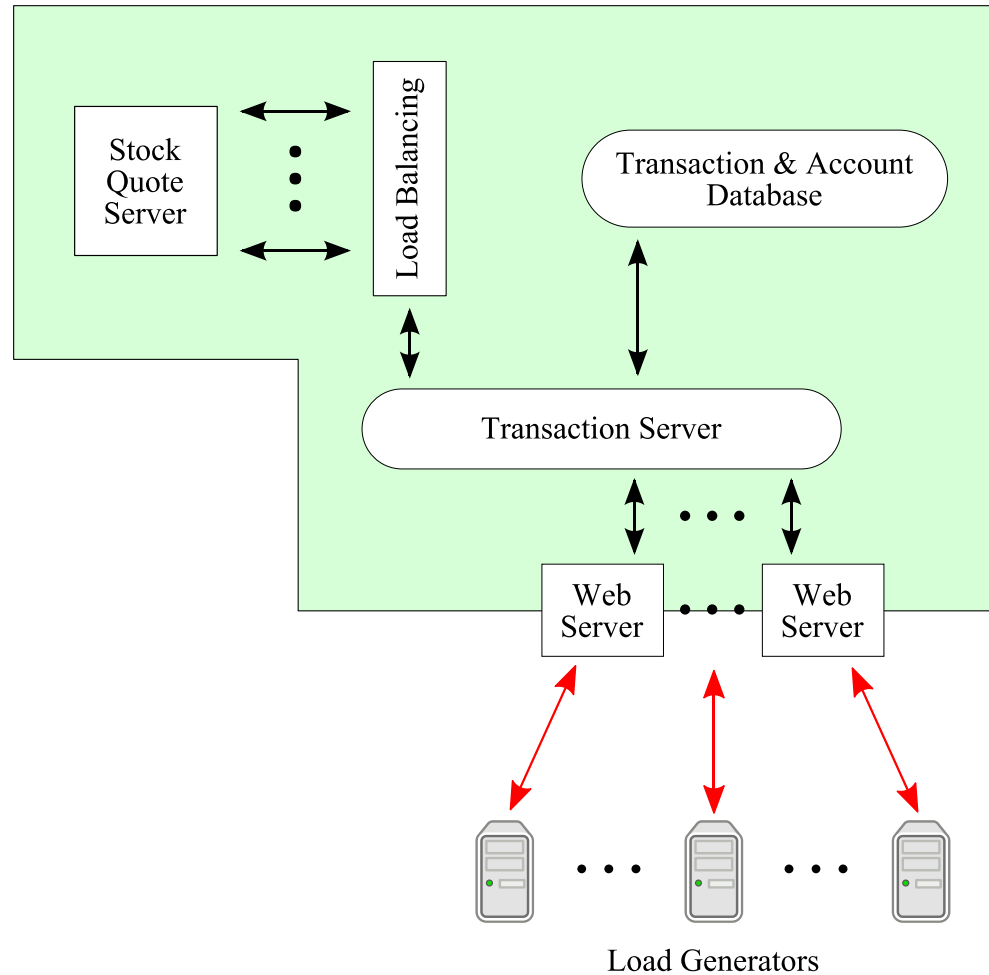


Workload – A Second Look

- ▶ A review of last week's tutorial
- ▶ A deeper look at workload files and log files



Load Generators



Workload Generator(s)

- ▶ Simulate web interface use
 - The web server “shouldn’t know the difference” between a real user and the workload generator
- ▶ Input a workload data file

```
[1] ADD, oY01WVirLr, 63511.53
```

```
[2] QUOTE, oY01WVirLr, S
```

```
[3] BUY, oY01WVirLr, S, 276.83
```

```
[4] COMMIT_BUY, oY01WVirLr
```

```
[5] COMMIT_SELL, oY01WVirLr
```

```
[6] CANCEL_SELL, oY01WVirLr
```

```
[7] QUOTE, oY01WVirLr, S
```



Workload Files

- ▶ The list of commands is on the project website
- ▶ Do not expect the workload files to be perfect
 - At least one has an intentional error in it
- ▶ Final documentation hint: At what points in your system must there be error checking?



Log Files

- ▶ Transactions on your system must be logged
 - These logs are submitted to the SENG 462 website to confirm completion of workload file milestones
- ▶ The contents of the files are fully described in the XML Schema file `logfile.xsd`, available on the project web site



Log File XSD

- ▶ The log entries are defined by `logfile.xsd`

```
<xsd:complexType name="LogType">
  <xsd:choice minOccurs="0" maxOccurs="unbounded">
    <xsd:element name="userCommand" type="UserCommandType"/>
    <xsd:element name="quoteServer" type="QuoteServerType"/>
    <xsd:element name="accountTransaction" type="AccountTransactionType"/>
    <xsd:element name="systemEvent" type="SystemEventType"/>
    <xsd:element name="errorEvent" type="ErrorEventType"/>
    <xsd:element name="debugEvent" type="DebugType"/>
  </xsd:choice>
</xsd:complexType>
```



Log File Examples

- ▶ Transaction number follow an individual transaction through the system
- ▶ They do not have to match the numbers in the workload file

```
<userCommand>
  <timestamp>1167631200000</timestamp>
  <server>CLT1</server>
  <transactionNum>1</transactionNum>
  <command>ADD</command>
  <username>jiosesdo</username>
  <funds>100.00</funds>
</userCommand>
<accountTransaction>
  <timestamp>1167631200200</timestamp>
  <server>CLT2</server>
  <transactionNum>1</transactionNum>
  <action>add</action>
  <username>jiosesdo</username>
  <funds>100.00</funds>
</accountTransaction>
```



Log File Examples (2)

- ▶ Quote server hits include a crypto key
- ▶ The crypto keys must match the logged quote server data
 - Yes, this is checked

```
<quoteServer>  
  <timestamp>1167631203000</timestamp>  
  <server>QSRV1</server>  
  <transactionNum>2</transactionNum>  
  <quoteServerTime>1167631203000</quoteSe  
  <username>jiosesdo</username>  
  <stockSymbol>ABC</stockSymbol>  
  <price>10.00</price>  
  <cryptokey>IRrR7UeT035kSWUgG0QJKmB35sL2  
</quoteServer>
```



Log File Examples (3)

```
<userCommand>
  <timestamp>1167631205200</timestamp>
  <server>CLT2</server>
  <transactionNum>4</transactionNum>
  <command>SELL</command>
  <username>bob</username>
  <stockSymbol>GHI</stockSymbol>
  <funds>1000.00</funds>
</userCommand>
<errorEvent>
  <timestamp>1167631206000</timestamp>
  <server>CLT2</server>
  <transactionNum>4</transactionNum>
  <command>SELL</command>
  <username>bob</username>
  <stockSymbol>GHI</stockSymbol>
  <funds>1000.00</funds>
  <errorMessage>Account bob does not exist</errorMessage>
</errorEvent>
```



Submitting Log Files

- ▶ The result from a logfile with incorrect XML format:

Logged in as: some_student

Students: [[Submit Activities](#)] [[Validate Submissions](#)] [[View or Edit Submissions](#)] [[Submit Log File](#)] [[Current Statistics](#)]

File uploaded successfully.

Attempting to validate logfile against XSD schema...XSD validation failed. Quitting.



Submitting Log Files

- ▶ Possible errors:
 - XML schema doesn't validate
 - Cryptokeys do not validate
 - Note: Only log real quote server hits as quoteServer entry, NOT hits to your quote server cache
 - Transactions per second cannot be calculated
 - Invalid transaction numbers



Log File Errors

▶ XML schema

- Log file format isn't correct
- The XSD file is on the project page
- Test with:

```
xmllint --schema logfile.xsd --noout yourlogfile.xml
```

▶ Crypto keys

- Must match the crypto key:
 - quote price
 - stock symbol
 - user id
 - quote server time stamp
- Log exactly what the quote server sent



Log File Errors

- ▶ Transactions per second
 - TPS requires more than one quote server hit
 - TPS is not calculated on the 1 user file
 - Only one quote server hit is needed
- ▶ Invalid transaction numbers
 - Number of transactions must match work load file
 - 1 user file: 100 transactions
 - Number of users must match work load file
 - If there are 100 transactions, it expects only 1 user



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