

MySQL



Agenda

- About MySQL
- How to connect to MySQL?
- Utilities in MySQL
- Mysql Installation
- Access Privileges
- Check Processes
- Kill Process ...continued



...Agenda Continued

- Backup
- Restore
- Replication
- Variables and status
- Engines and their Benefits
- Optimization
 - Explain
 - Index



About MySQL

- The world's most popular open source database.
- MySQL is a key part of LAMP.
- 100 million copies of its software downloaded.
- Database is owned, developed and supported by Sun Microsystems,
- **RDBMS**



How to connect to MySQL?

- Use "MySQL" client.
- `/usr/local/mysql/bin/mysql`
- Options
 - `-? help`
 - `-u user`
 - `-p password`
 - `-P port`

... continued



- Options

- -h host
- -V sersion
- -S socket
- -D database
- -B batch
- -s silent



MYSQL INSTALLATION

- Installation Methods
 - RPM version
 - Binary version
 - Source version

...Installation continued

- Download the latest binary release from:

<http://dev.mysql.com/downloads/mysql/>

- Untar the mysql tar file

```
tar -xvzf /usr/local/<mysqlversion>
```

- Configure the Datadir

```
cd /usr/local/<mysqlversion>
```

```
scripts/mysql_install_db --datadir=<mysql_data_dir>
```

- Copy the medium.cnf from support files to the

...Installation continued

- 
- Start the mysql server

```
/usr/local/<mysqlversion>/bin/mysqld_safe --defaults-  
file=/etc/my.cnf --datadir=/<mysql_data_dir> --user=mysql  
&
```

- Connect to the mysql Server.

```
/usr/local/<mysqlversion>/bin/mysql -u root -p  
-S /tmp/mysql.sock
```



Privileges

- Privilege database – mysql
- Privilege table – user table
- Db privileges – db table
- Table privileges – table_priv table
- Column privilege – column_priv table
- Grant Privilege
Grant privileges on Databases.table to `user` @ `hostname`
identified by password 'password';
- Check the privilege
Show grants for `user` @ `hostname` ;



Check Process

■ Show processlist;

■ mysql> show processlist;

■ | Id | User | Host | db | Command | Time | State | Info |

■ | 233 | replicate | 202.144.50.94:32801 | NULL | Binlog Dump | 1512070 | Has sent all binlog to slave; waiting for binlog to be updated | NULL |

■ | 6740809 | replicate | 124.7.61.30:60188 | NULL | Binlog Dump | 331347 | Has sent all binlog to slave; waiting for binlog to be updated | NULL |

■ | 6881961 | broadband | 202.144.50.91:60557 | broadbandnew | Sleep | 2 | | NULL |

■ | 6881965 | broadband | 202.144.50.91:60558 | broadbandnew | Sleep | 0 | | NULL |

■ | 6881977 | navis | 210.18.6.86:50765 | broadbandnew | Sleep | 0 | | NULL |

■ | 6881998 | navis | 202.144.50.89:32999 | broadbandnew | Sleep | 2 | | NULL |

■ | 6882004 | navis | 202.144.50.93:44760 | broadbandnew | Sleep | 2 |



Kill Process

- Kill <pid>



BACKUP

- Hotbackup

- Mysqldump

- Coldbackup

- snapshot

- Mysqldump

```
/usr/local/mysql/bin/mysqldump -u root -p  
-S /tmp/mysql.sock dbname  
--tab=<location_to_take_backup>
```

- Outfile

```
select * into outfile '<location_to_take_backup>'  
from tablename;
```



Restore

- Mysqlimport

```
cat *.sql | /usr/local/mysql/bin/mysql -u root -p -S  
/tmp/mysql.sock
```

```
/usr/local/mysql/bin/mysqlimport -u root -p  
-S /tmp/mysql.sock dbname <location_of_backup>.txt
```

- Import from outfile

```
load data infile '<location_of_backup>.txt' into table  
db.tablename;
```



ENGINE TYPES

- MyISAM
- InnoDB
- Falcon
- Memory
- Merge
- Archive
- Federated

- NDB
- CSV
- BlackHole
- Example



Which Engine to use?

- Things to be considered

Read

Write

Storage space

Transaction

OPTIMIZATION

INDEX

ad table

company_num	ad_num	hit_fee
14	48	0.01
23	49	0.02
17	52	0.01
13	55	0.03
23	62	0.02
23	63	0.01
23	64	0.02
13	77	0.03
23	99	0.03
14	101	0.01
13	102	0.01
17	119	0.02

index
13
13
13
14
14
17
17
23
23
23
23
23
23

ad table

company_num	ad_num	hit_fee
14	48	0.01
23	49	0.02
17	52	0.01
13	55	0.03
23	62	0.02
23	63	0.01
23	64	0.02
13	77	0.03
23	99	0.03
14	101	0.01
13	102	0.01
17	119	0.02



OPTIMIZATION

- EXPLAIN

- EXPLAIN SELECT select_options

- id

- select type

- table

- type

- system

- const

- eq_ref

- ref

- ref_or_null

- unique_subquery

... continued

- 
-
- index_subquery
 - range
 - index
 - All
 - Key
 - Key_len
 - ref
 - rows
 - Extra



Example

```
mysql> SELECT t1.i1, t2.i2 FROM t1, t2 WHERE t1.i1 = t2.i2;
```

```
+-----+-----+
| i1    | i2    |
+-----+-----+
|      1 |      1 |
|      2 |      2 |
|      3 |      3 |
|      4 |      4 |
|      5 |      5 |
...

```

...continued

```
mysql> EXPLAIN SELECT t1.i1, t2.i2 FROM t1, t2 WHERE t1.i1 = t2.i2\G
***** 1. row *****
      id: 1
    select_type: SIMPLE
      table: t1
        type: ALL
possible_keys: NULL
          key: NULL
        key_len: NULL
          ref: NULL
         rows: 1000
      Extra:
***** 2. row *****
      id: 1
    select_type: SIMPLE
      table: t2
        type: ALL
possible_keys: NULL
          key: NULL
        key_len: NULL
          ref: NULL
         rows: 1000
      Extra: Using where
```



After Index Explain

```
mysql> ALTER TABLE t2 ADD INDEX (i2);
mysql> EXPLAIN SELECT t1.i1, t2.i2 FROM t1, t2 WHERE t1.i1 = t2.i2\G
***** 1. row *****
      id: 1
    select_type: SIMPLE
      table: t1
        type: ALL
possible_keys: NULL
         key: NULL
      key_len: NULL
         ref: NULL
        rows: 1000
      Extra:
***** 2. row *****
      id: 1
    select_type: SIMPLE
      table: t2
        type: ref
possible_keys: i2
         key: i2
      key_len: 5
         ref: sampdb.t1.i1
        rows: 10
      Extra: Using where; Using index
```

...continued

```
mysql> ALTER TABLE t1 ADD INDEX (i1);
mysql> EXPLAIN SELECT t1.i1, t2.i2 FROM t1, t2 WHERE t1.i1 = t2.i2\G
***** 1. row *****
      id: 1
    select_type: SIMPLE
      table: t1
        type: index
possible_keys: i1
      key: i1
     key_len: 5
        ref: NULL
       rows: 1000
     Extra: Using index
***** 2. row *****
      id: 1
    select_type: SIMPLE
      table: t2
        type: ref
possible_keys: i2
      key: i2
     key_len: 5
        ref: sampdb.t1.i1
       rows: 10
     Extra: Using where; Using index
```



DO's

- compare columns that have the same data type
- indexed columns stand alone in comparison expressions
 - SELECT * FROM mytbl WHERE mycol < 4 / 2;
 - SELECT * FROM mytbl WHERE mycol * 2 < 4;
 - SELECT * FROM mytbl WHERE YEAR(date_col) < 1990;
 - SELECT * FROM mytbl WHERE date_col < '1990-01-01';
- Give the optimizer hints
 - STRAIGHT_JOIN
 - SELECT STRAIGHT_JOIN ... FROM t1, t2, t3 ... ;
 - SELECT ... FROM t1 STRAIGHT_JOIN t2 STRAIGHT_JOIN t3 ... ;
- Test alternative forms of queries, but run them more than once

... continued

- 
- Avoid overuse of MySQL's automatic type conversion

For example

if num_col is an integer column

```
SELECT * FROM mytbl WHERE num_col = 4;
```

```
SELECT * FROM mytbl WHERE num_col = '4';
```

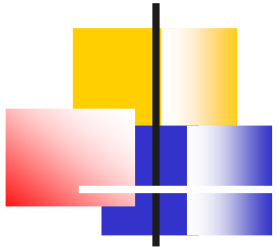
Will both yield the same result?

- Consider using ENUM columns
- Use OPTIMIZE TABLE for tables that are subject to fragmentation
- Use a synthetic index
- Segregate BLOB or TEXT columns into a separate table



DON'Ts

- Don't use wildcards at the beginning of a LIKE pattern
- Don't use longer columns when shorter ones will do
- Don't define column's to be NULL
- Avoid retrieving large BLOB or TEXT values unless you must



Questions???