Getting started with MySQL Proxy

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Sofia - OpenFest 2007

Agenda

- Overview
- Some fun
- Injecting queries
- Filtering and rewriting queries
- Working with results
- Proxy for logging and debugging
- Replication goodies
- Q&A

MySQL

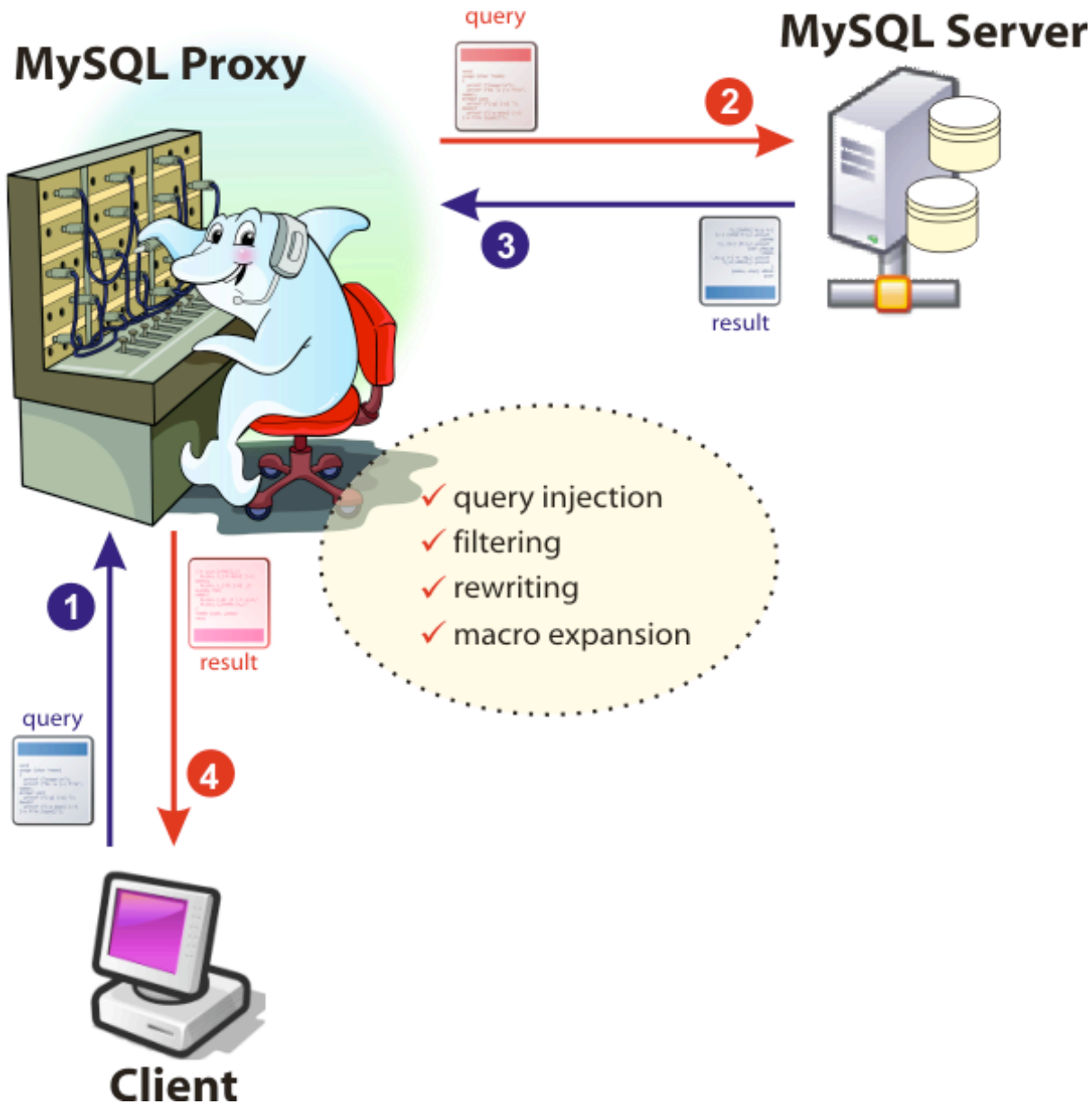
Proxy (< lat. procuratio)

= Someone taking care of someone else's interests

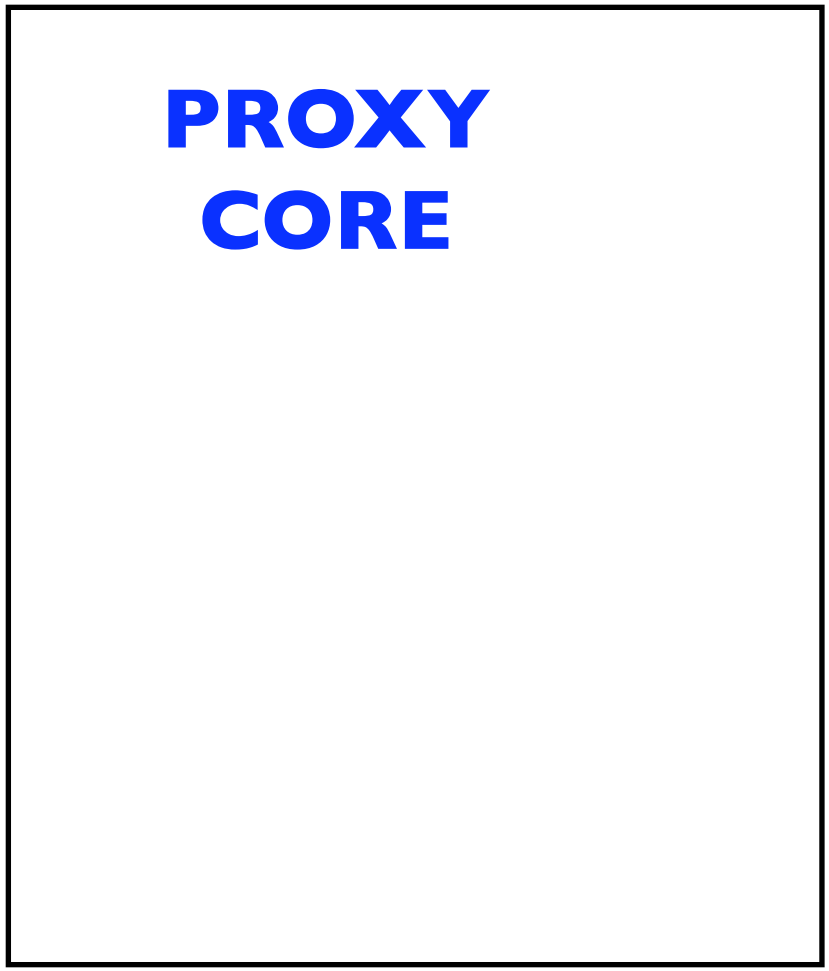
A server proxy is something acting on behalf of another server

MySQL

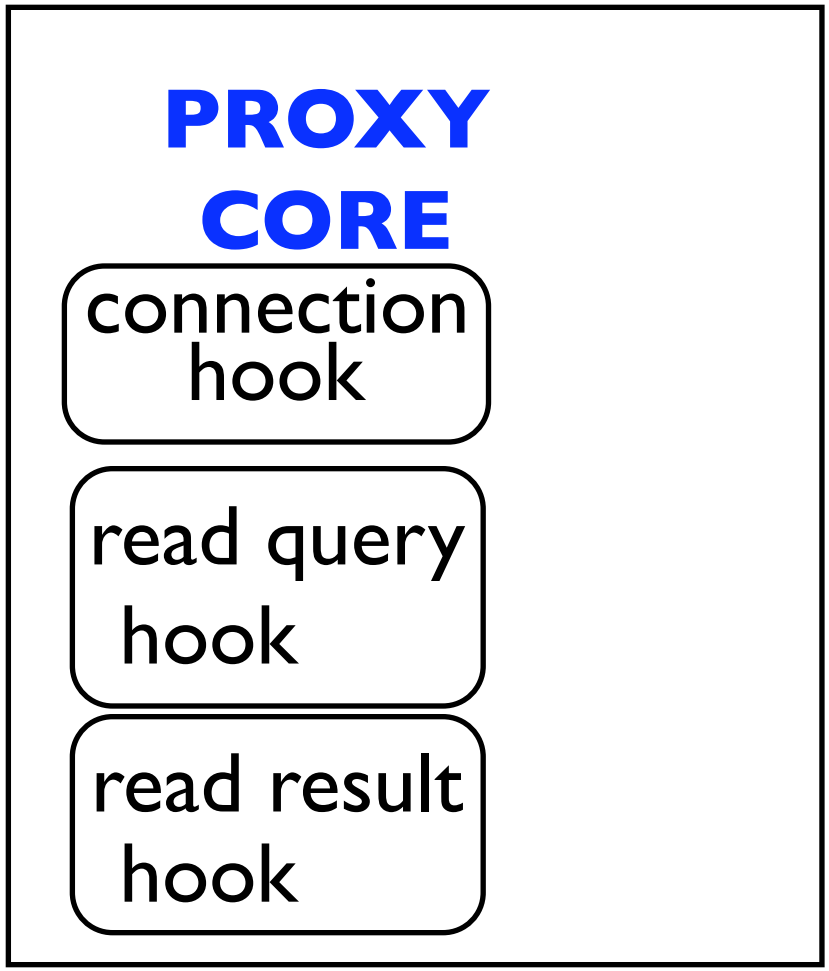
Overview


query
MySQL Server
MySQL Proxy
2
3
result
✓ query injection
✓ filtering
✓ rewriting
✓ macro expansion
1
result
query
4
Client

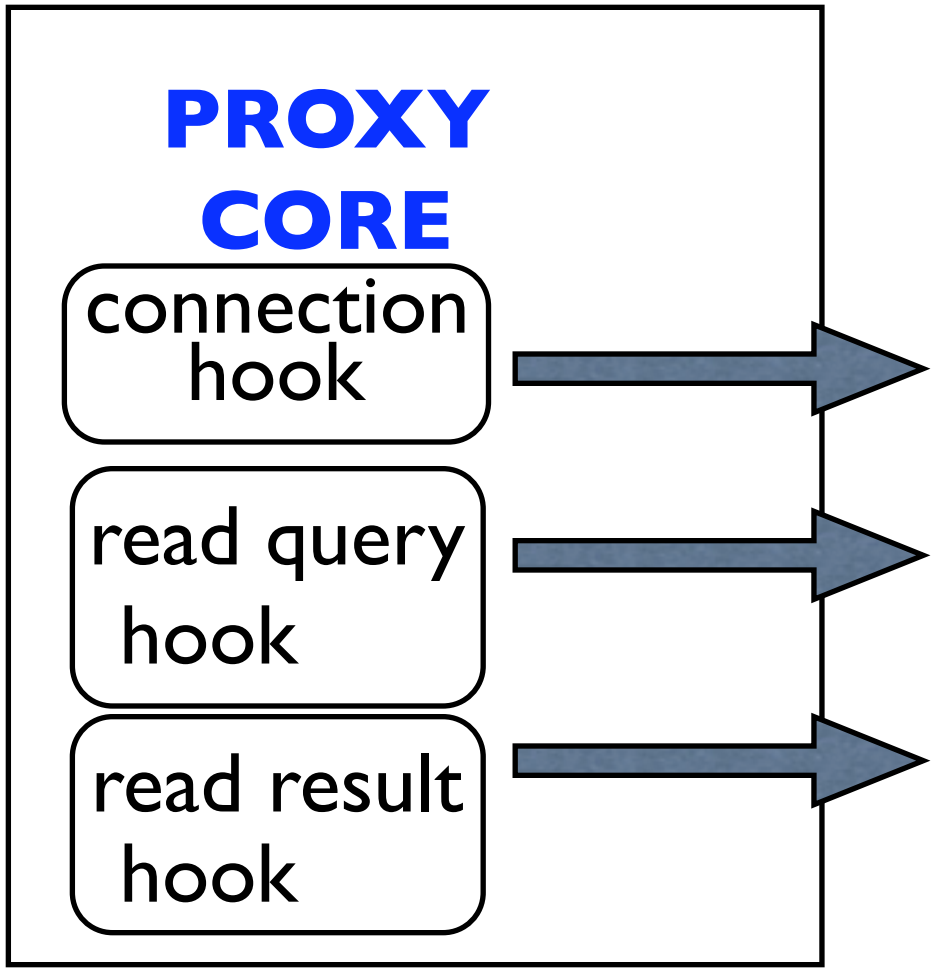
Overview



Overview


PROXY
CORE
connection hook
read query hook
read result hook

Overview


PROXY
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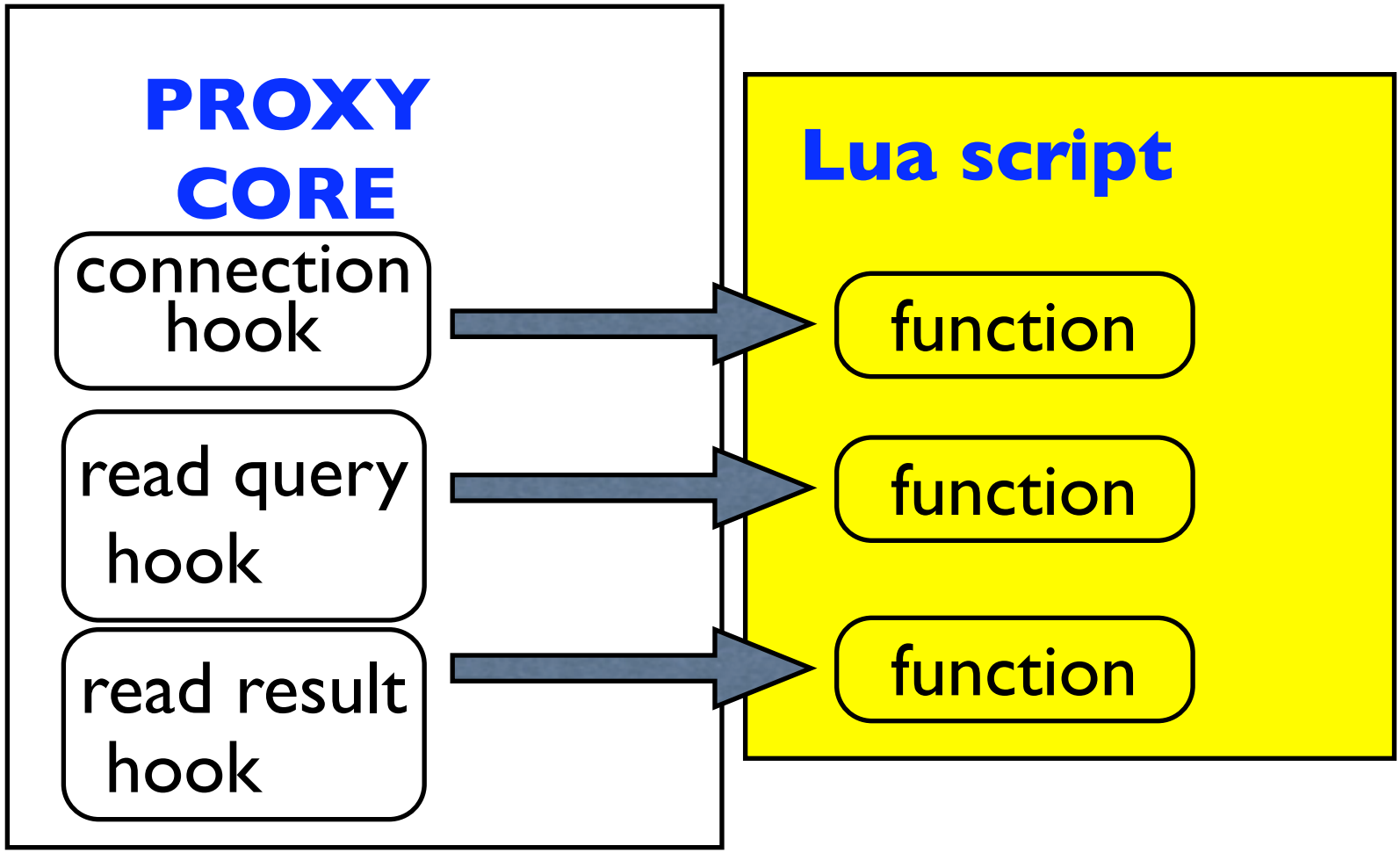
Overview


PROXY CORE
connection hook
read query hook
read result hook
Lua script
function
function
function

Overview

??

Overview

Why not ...

- Perl ?
- PHP?
- Javascript?
- [whatever]?

Overview

Overview

SMALL (< 200 KB)

Overview

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DESIGNED for EMBEDDED systems

Overview

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DESIGNED for EMBEDDED systems

Widely used (lighttpd)

Overview

SMALL (< 200 KB)

DESIGNED for EMBEDDED systems

Widely used (lighttpd)

lighttpd, like MySQL Proxy, was created by Jan Kneschke

Overview

Very popular among game writers

Overview

Very popular among game writers

Overview

Very popular among game writers

Some fun

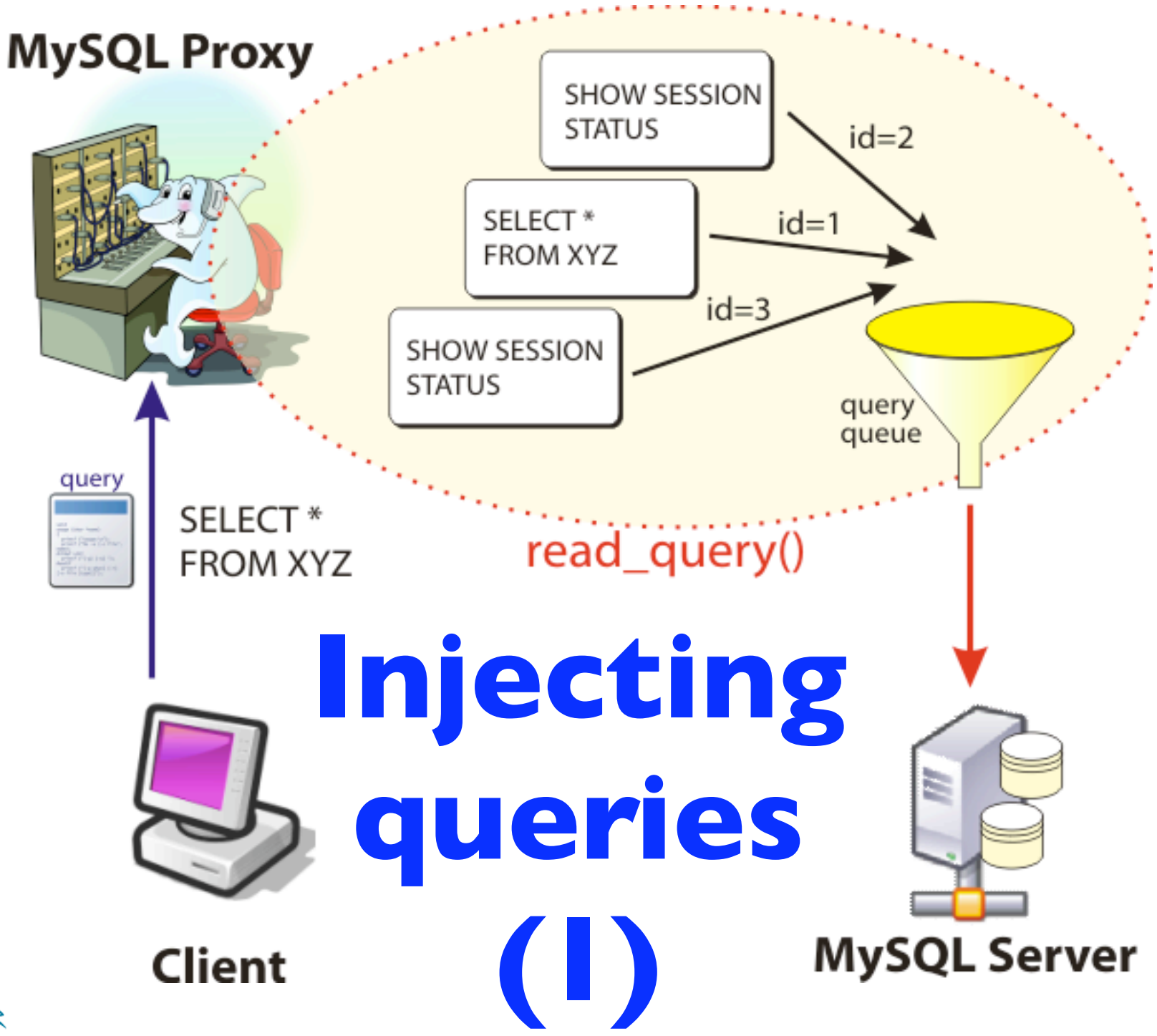
LIVE

MySQL

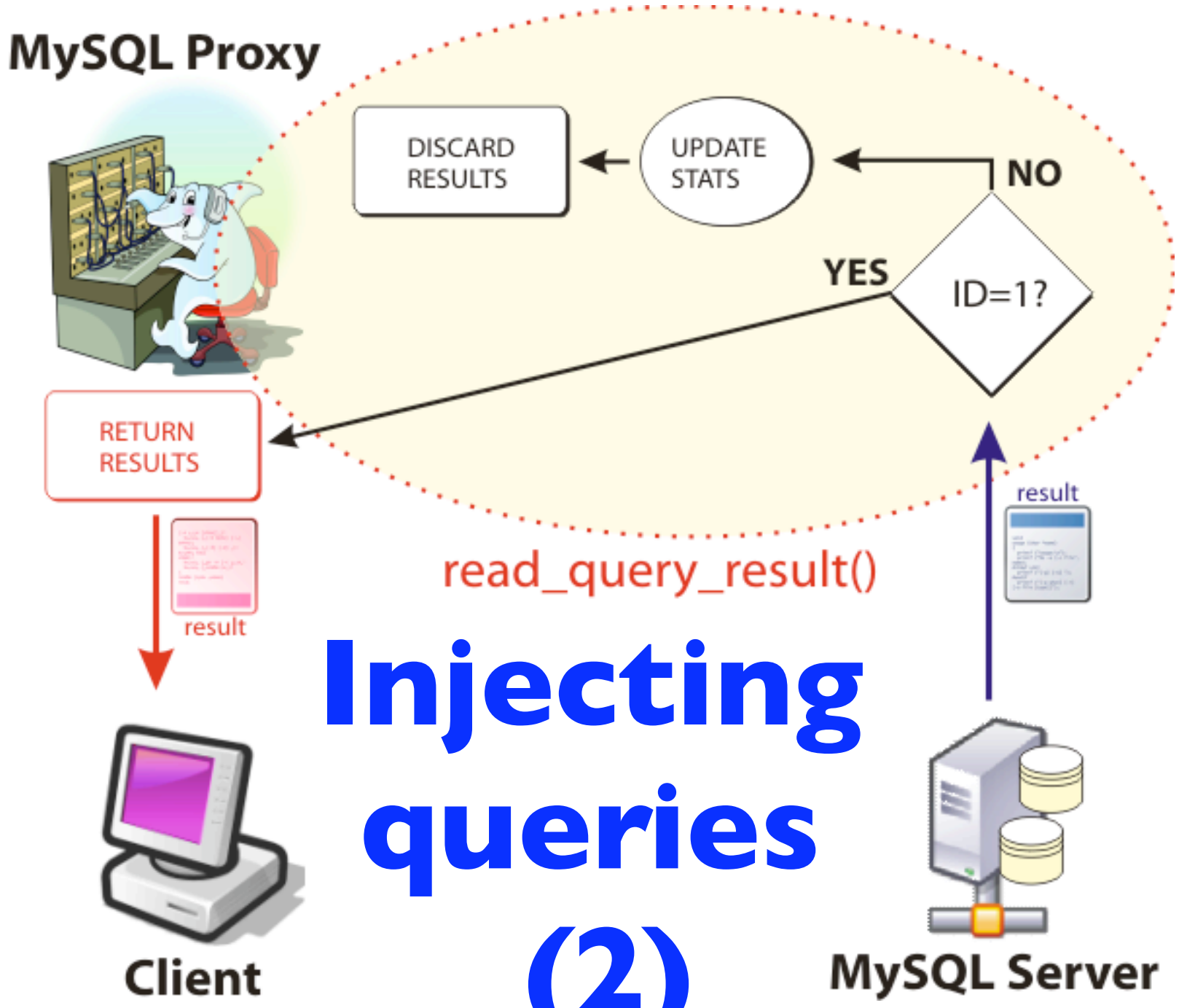
Intercepting

```
function read_query(packet)
 if packet:byte() == proxy.COM_QUERY
  then
  local query = packet:sub(2)
  print("Hello world! Seen query: "
      .. query )
 end
end
```

MySQL



Injecting queries (I)



Injecting queries (2)

injecting

```
function read_query(packet)
   -- ...
   proxy.queries:append(2, query1 )
   proxy.queries:append(1, packet )
   proxy.queries:append(3, query2 )

   return  proxy.PROXY_SEND_QUERY

end
```

MySQL

injecting

```
function read_query_result(inj)

  if res.id == 1 then
    return  proxy.PROXY_SEND_RESULT
  else
    -- do something
    return  proxy.PROXY_IGNORE_RESULT
end
```

MySQL

filtering queries

- Like injecting
- but without the original

working with results

working with results

- return the original result

working with results

- return the original result
- return a fake result

working with results

- return the original result
- return a fake result
- return an error

working with results

- return the original result
- return a fake result
- return an error
- alter the original result

working with results

- return the original result
- return a fake result
- return an error
- alter the original result
- return something different (affected/retrieved)

debugging

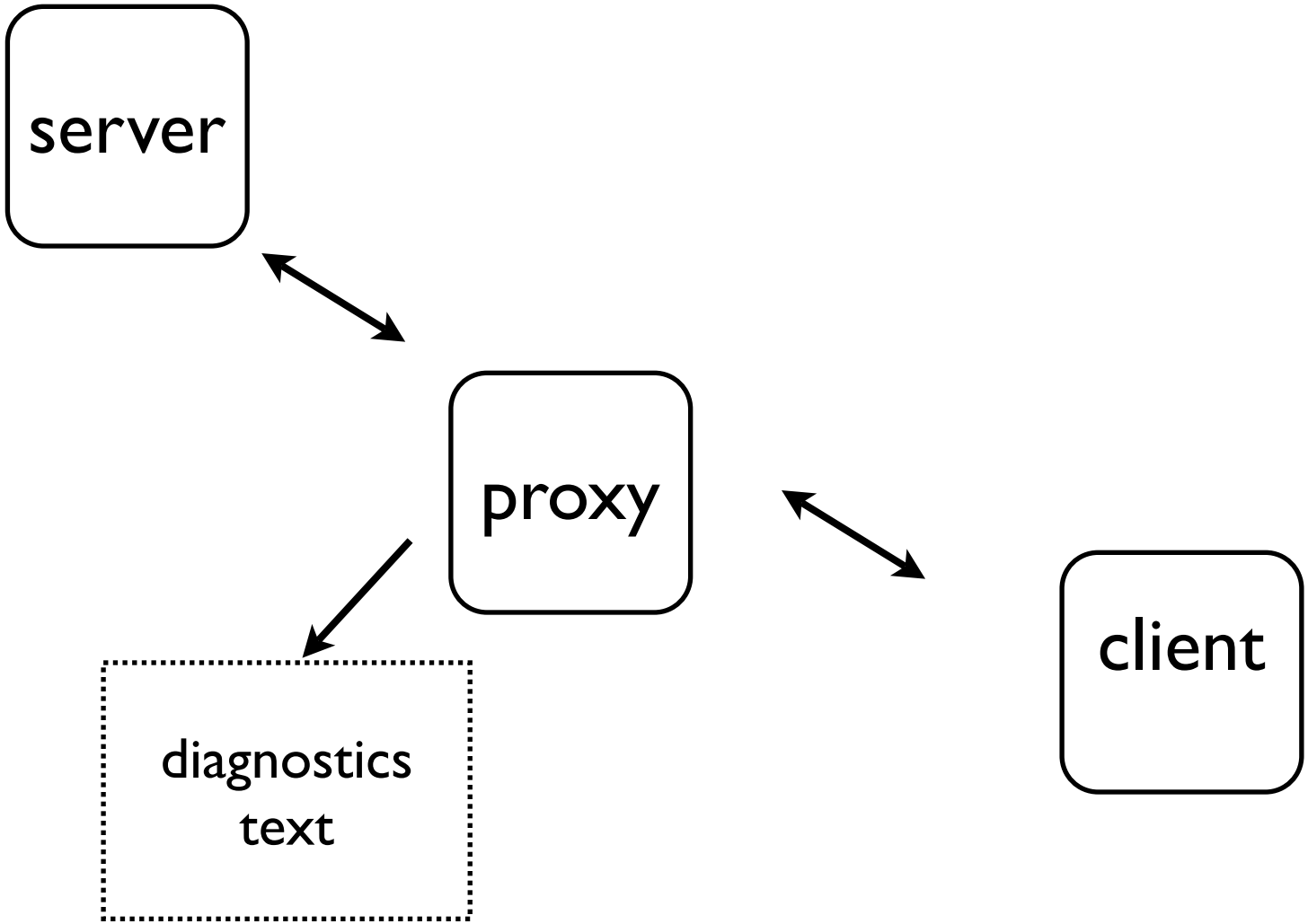
debugging

- Put a Proxy in between

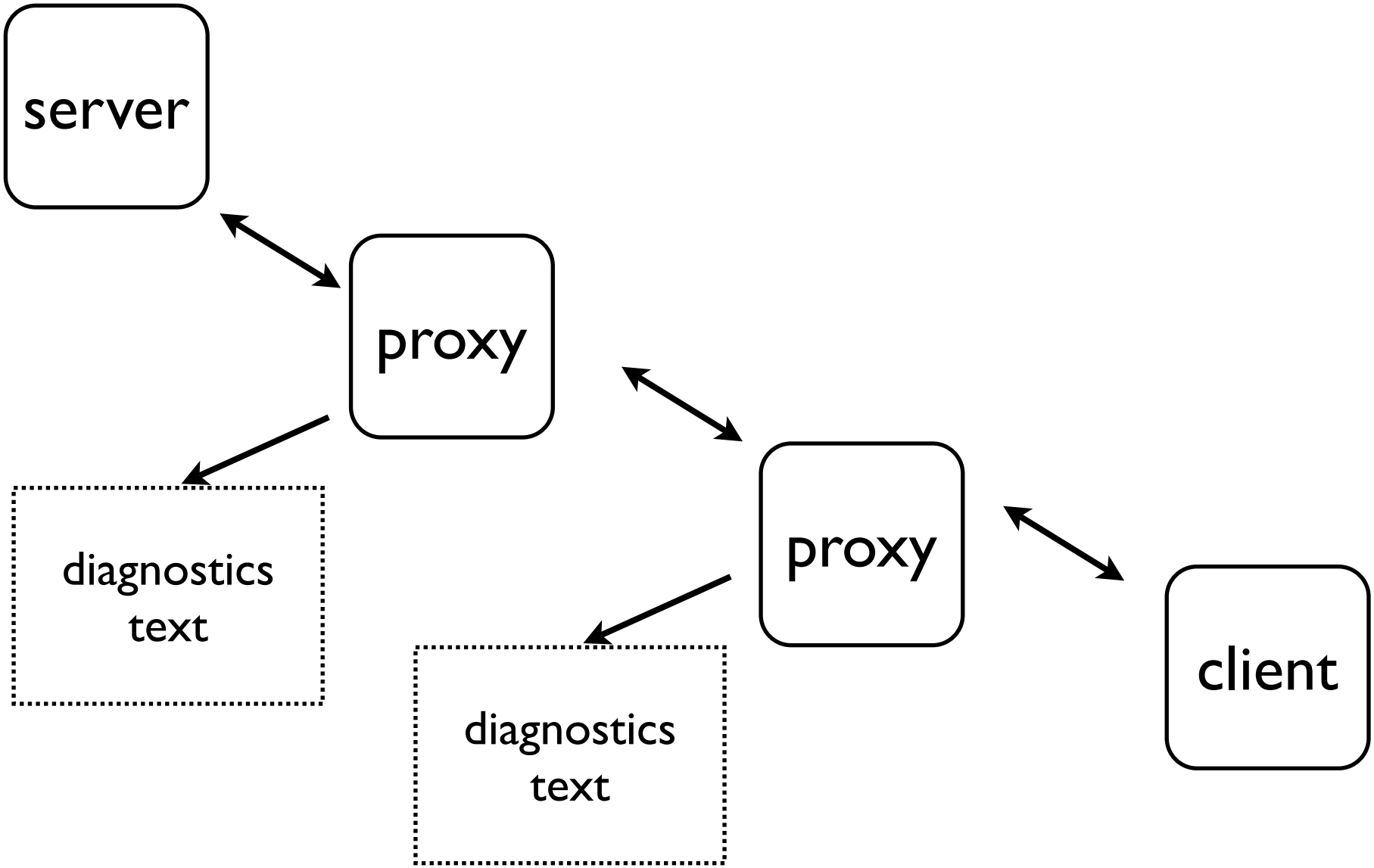
debugging

- Put a Proxy in between
- use a sensible script to see what's going on (e.g. tutorial-packets.lua or tutorial-states.lua)

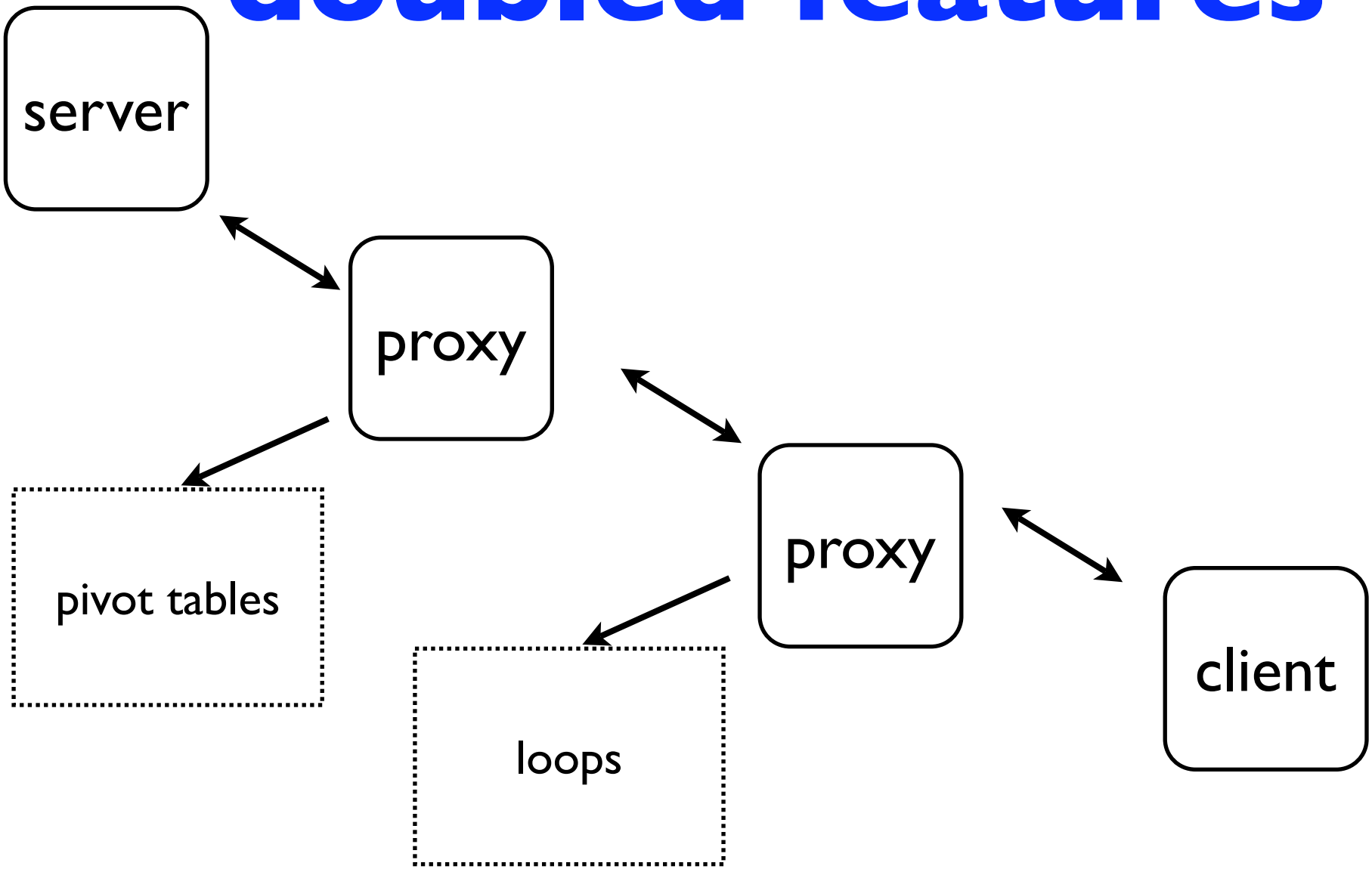
debugging



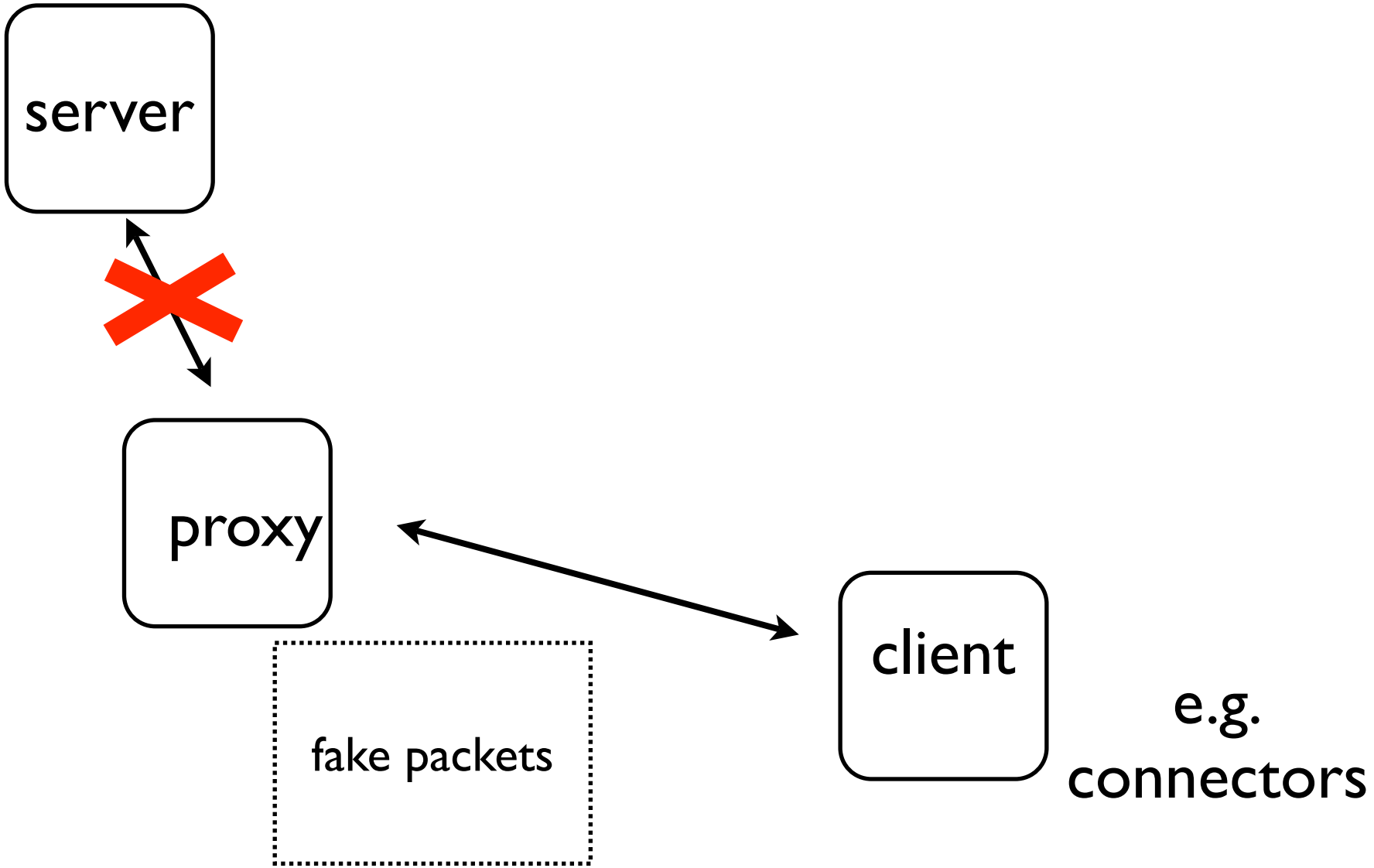
debugging scripts



Chained proxies: doubled features



Testing



logging via Proxy

```
# client (1)
mysql> drop table t1;
Query OK, 0 rows affected
(0.05 sec)

mysql> create table t1 (i
int);
Query OK, 0 rows affected
(0.02 sec)
```

MySQL

logging via Proxy

```
# proxy (1)
2007-08-24 11:37:28 296 --
drop table t1 >{0}

2007-08-24 11:37:35 296 --
create table t1 (i int) >{0}
```

MySQL

logging via Proxy

```
# client (2)
mysql> insert into t1;
ERROR 1064 (42000): You
have an error in your SQL
syntax;
```

MySQL

logging via Proxy

```
# proxy (2)

2007-08-24 11:37:43 296 --
insert into t1 >{0} [ERR]
```

MySQL

logging via Proxy

```
# client (3)
mysql> insert into t1 values (1), (2);
Query OK, 2 rows affected (0.01 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> select * from t1;
+------+
| i    |
+------+
|    1 |
|    2 |
+------+
2 rows in set (0.00 sec)
```

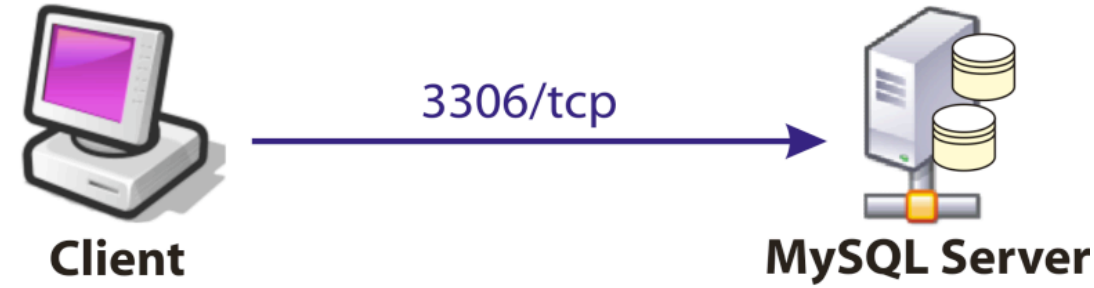
MySQL

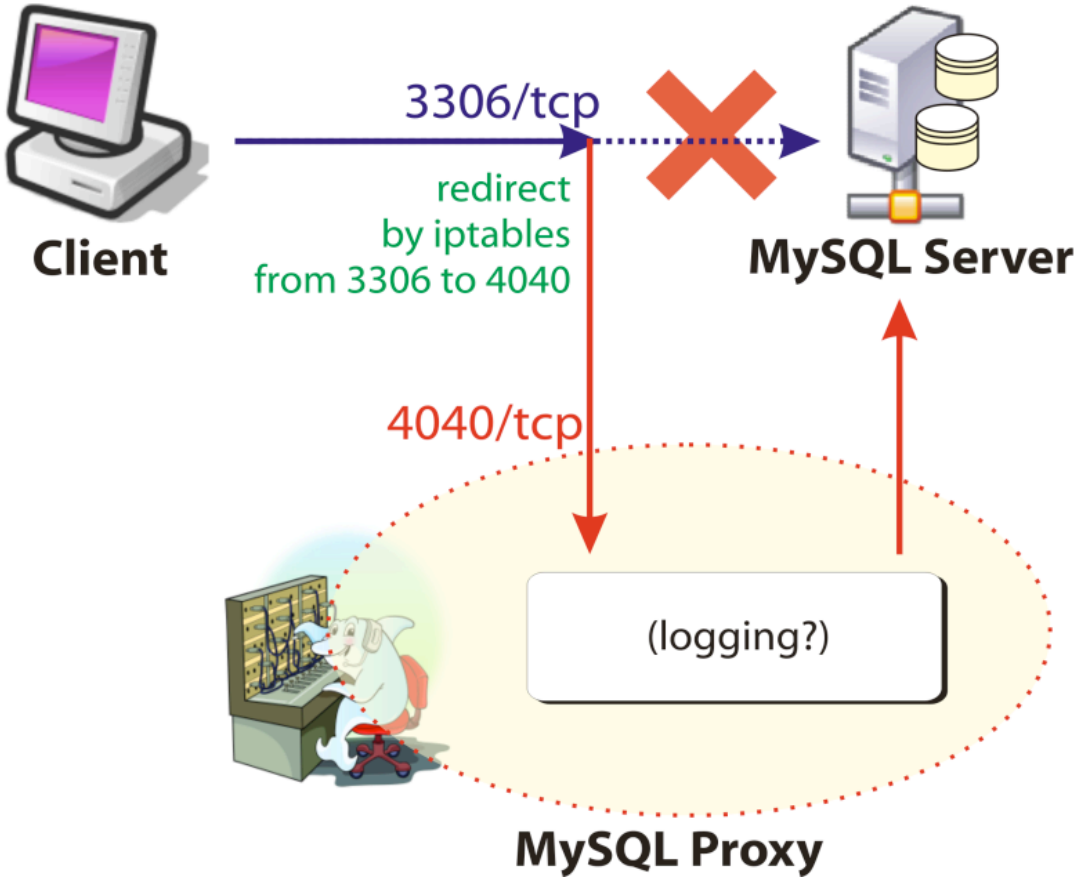
logging via Proxy

```
# proxy (3)

2007-08-24 11:38:00 296 --
insert into t1 values (1),(2) >{2}

2007-08-24 11:38:03 296 --
select * from t1 <{2}
```

MySQL

Rerouting traffic





Rerouting traffic

(1) do

```
sudo iptables -t nat \
   -I PREROUTING \
   -s ! 127.0.0.1 -p tcp \
   --dport 3306 -j \
   REDIRECT --to-ports 4040
```

MySQL

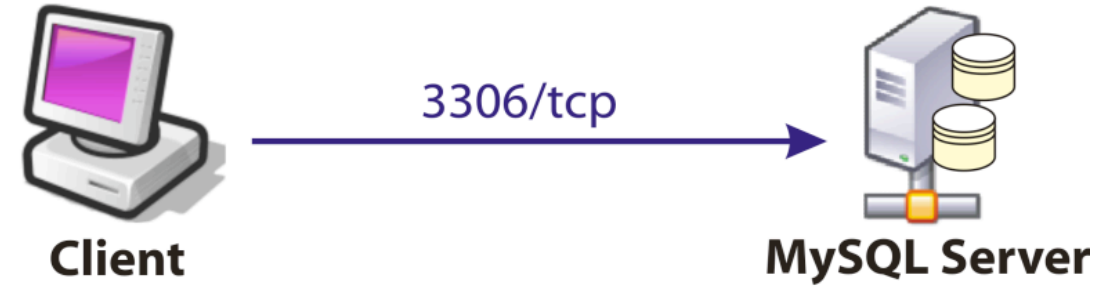
Rerouting traffic

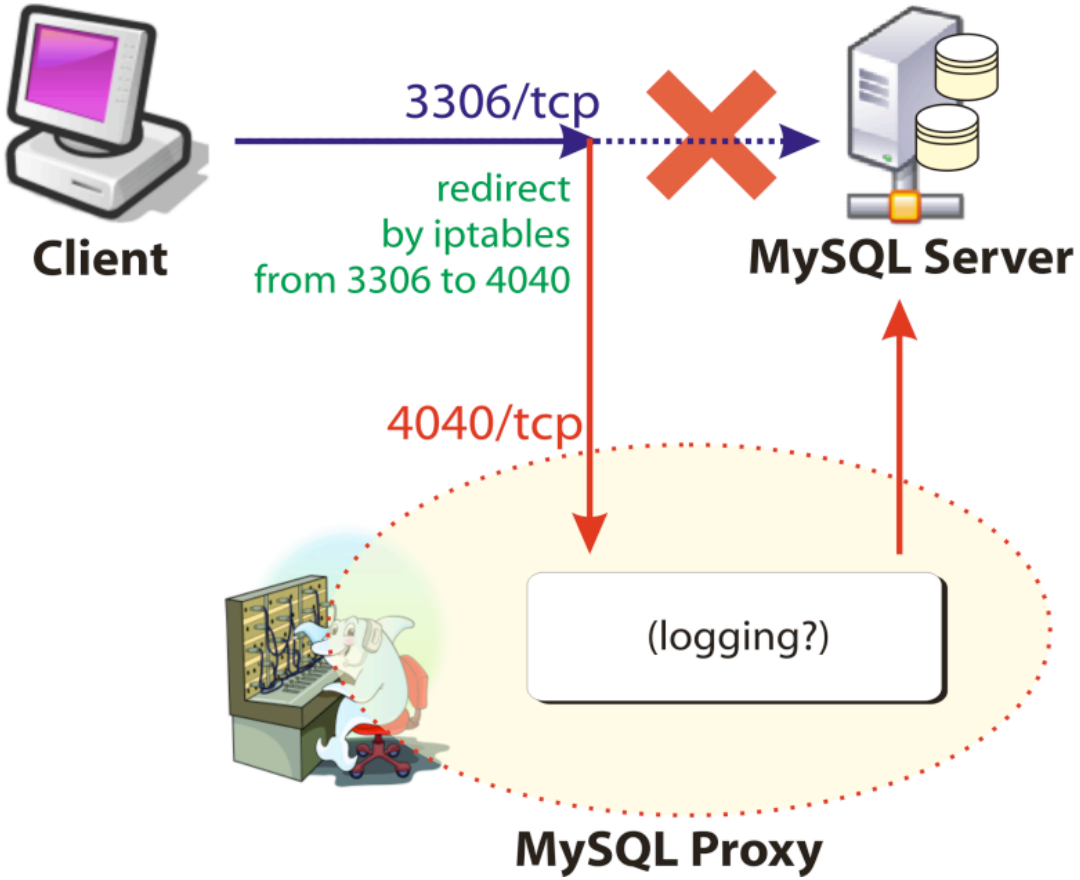
(1) undo

```
sudo iptables -t nat \
   -D PREROUTING \
   -s ! 127.0.0.1 -p tcp \
   --dport 3306 -j \
   REDIRECT --to-ports 4040
```

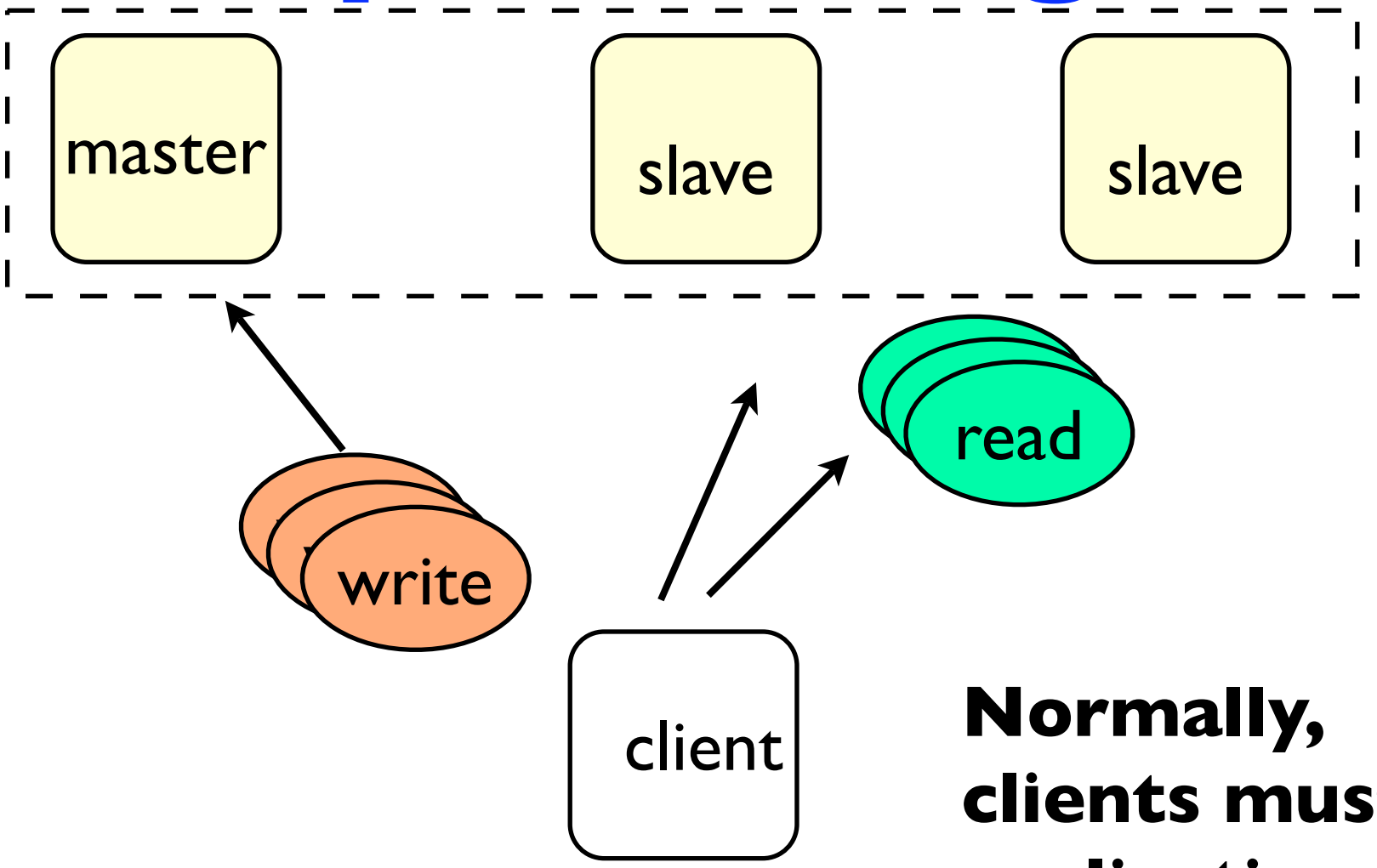
MySQL

Rerouting traffic



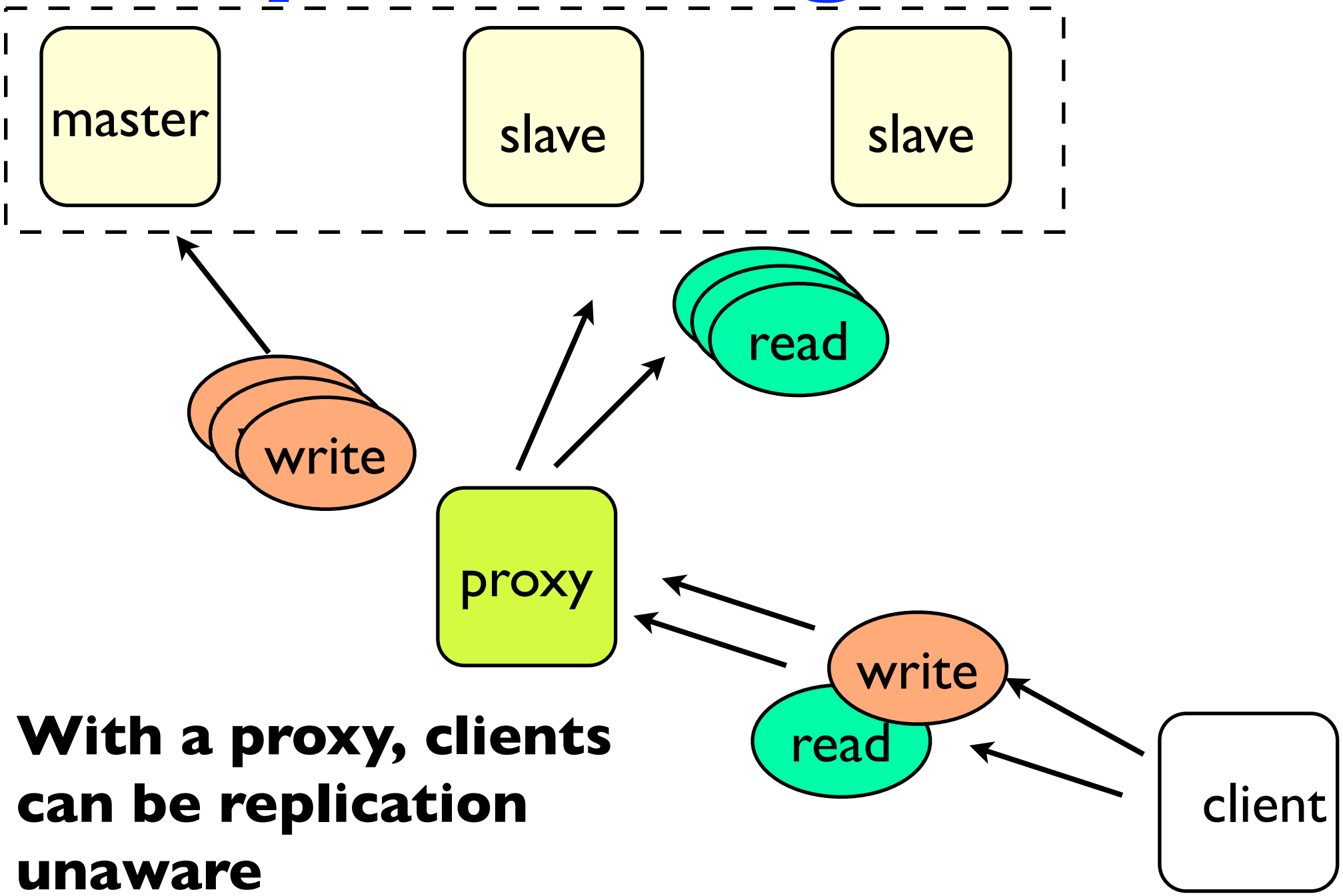


replication goodies



Normally, clients must be replication-aware

replication goodies



With a proxy, clients can be replication unaware

Live examples

- loops
- logs
- shell access
- pivot tables
- more ...

MySQL

Q&A

Any questions?

slides at http://datacharmer.org

MySQL