MySQL Proxy

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Лекторът

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- работи за MySQL като разработчик
- в момента част от частта занимаваща с клиентските библиотеки
- автор на MySQL Event Scheduler, част от 5.1 (дипломна работа)
- бърка в кода на PHP от години
- разработил почти изцяло mysqlnd
- поддържа ext/mysql и ext/mysqli заедно с Georg Richter

- ... ще се опитам да отговоря на въпросите си - просто ги задайте! Ако сте срамежливи, ще ви очаквам след лекцията.
- ... отговарям на, някои, писма изпратени до мен на andrey@mysql.com
Agenda

• Use cases
• Implementation
• Usage
• Lua scripting
• Next Steps
Proxy (lat. "proximus", ...)  

- a proxy is someone who executes something on behalf of someone else  
- proxy-servers forward requests to servers and can:  
  - transform  
  - handle or  
  - block them
History

• implemented in a weekend session in March 2007
• designed to handle thousands of parallel connections (c10k)
• uses a embedded scripting language for customizations
Load Balancing

• load balancing distributes the load across several slaves

• SQF is default:
  – Shortest Queue First
  – send new connections to the server with the least number of open connections

• Other balancers via scripts
Fail Over

• dead hosts are detected
• taking out of load balancing for 2min
• uses custom load balancers to decide how to handle a dead host:
  – hot + standby
  – normal load balancing
Scripting

• proxy embeds LUA
• allows analyzing and manipulating packets:
  – Inspection
  – Rewriting
  – Blocking
  – Injection
Query rewriting

• Macro Packages (ls, cd, who, ...)
• tagging queries with SQL_CACHE
• migrating table-names
• turn EXPLAIN UPDATE|DELETE into equivalent EXPLAIN SELECT
Query Injection

- SHOW SESSION STATUS around a Query
- EXPLAIN to track index usage
- logging all generated warnings
- Global Transaction IDs
Transparency

- goal is to be transparent to the application layer
- SHOW WARNINGS can be worked around with Query Injection
- SELECT USER() shows the connected user (the proxy, not the client) which can be corrected with result-set rewriting
Latency

• early tests via localhost
• same script run directly and through the proxy
• latency per mysql-packet: 0.4ms
• \texttt{ping} RTT on 1Gbit: 0.1ms
Connection Pooling

• reusing open connections between proxy and server
• reduces concurrency on the MySQL Server
• external connection pool for PHP
• routing of Queries
Statement routing

• split the query stream into reading and writing Queries

• **READs** go to the slaves

• **WRITEs** and transactions to the master

• automatic scale-out

• sharding
Future Work

- Replication
  - Filtering
  - Routing
  - Manipulation
- Parallel Inserts
- Delayed Replication
Въпроси?

Ако ви е срам, пишете ми на електронната поща или ме попитайте след лекцията!