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Ask Bigger Questions

Mastering Sqoop for Data Transfer for Big Data

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Who Are We?

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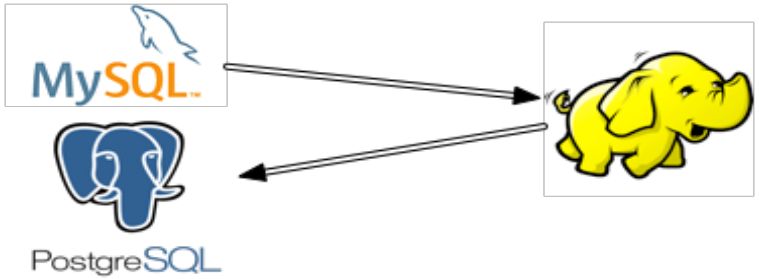
What is Sqoop?

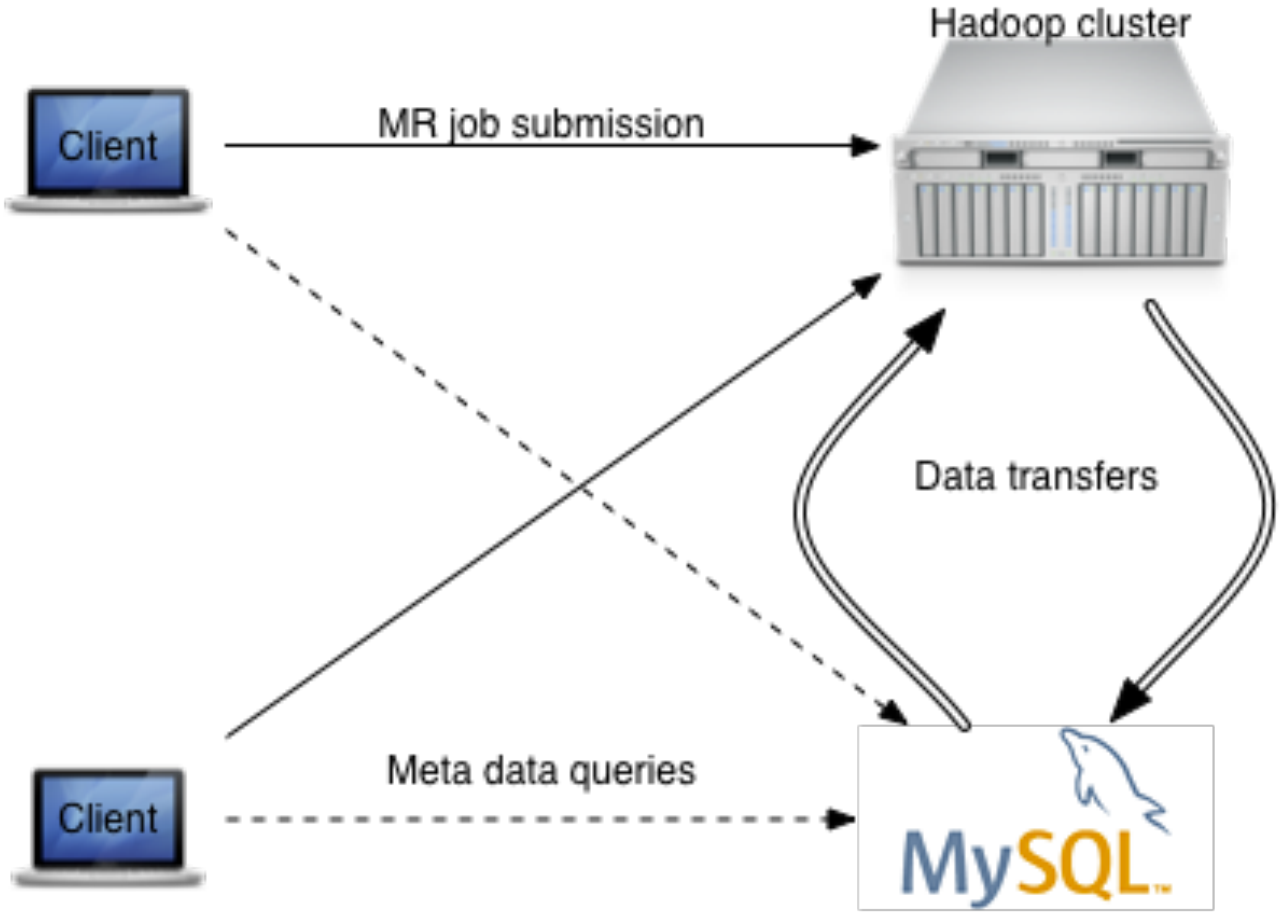
- Apache Top-Level Project
- SQl to hadOOP
- Tool to transfer data from relational databases
  - Teradata, MySQL, PostgreSQL, Oracle, Netezza
- To Hadoop ecosystem
  - HDFS (text, sequence file), Hive, HBase, Avro
- And vice versa



Why Sqoop?

- Efficient/Controlled resource utilization
  - Concurrent connections, Time of operation
- Datatype mapping and conversion
  - Automatic, and User override
- Metadata propagation
  - Sqoop Record
  - Hive Metastore
  - Avro

Sqoop 1


Hadoop cluster
Client
MR job submission
Data transfers
Client
Meta data queries
MySQL

Sqoop 1

- Based on Connectors
  - Responsible for Metadata lookups, and Data Transfer
  - Majority of connectors are JDBC based
  - Non-JDBC (direct) connectors for optimized data transfer
- Connectors responsible for all supported functionality
  - HBase Import, Avro Support, ...

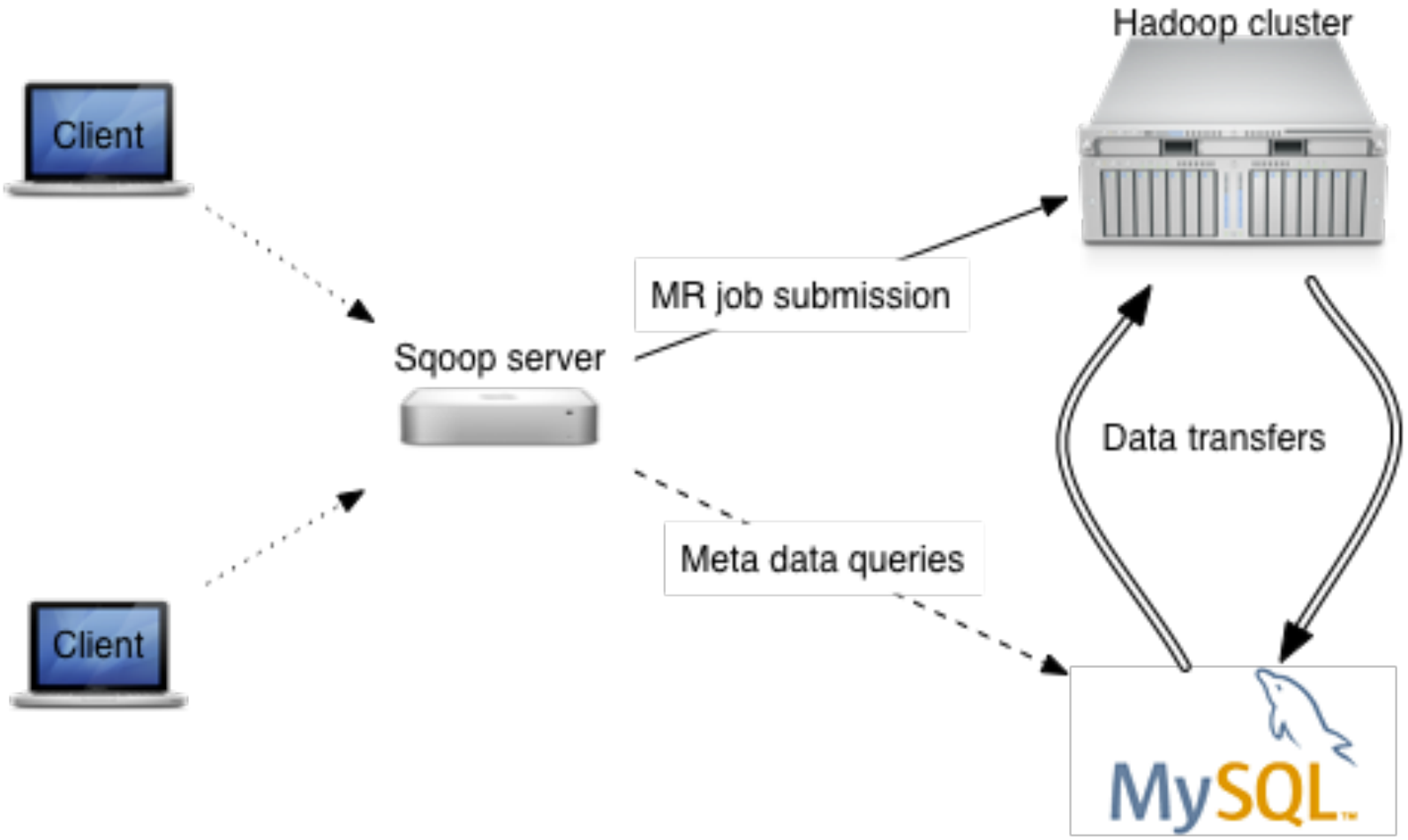
Sqoop 1 Challenges

- Cryptic, contextual command line arguments
- Security concerns
- Type mapping is not clearly defined
- Client needs access to Hadoop binaries/configuration and database
- JDBC model is enforced

Sqoop 1 Challenges

- Non-uniform functionality
  - Different connectors support different capabilities
- Overlapped/Duplicated functionality
  - Different connectors may implement same capabilities differently
- High coupling with Hadoop
  - Database vendors required to understand Hadoop idiosyncrasies in order to build connectors.

Sqoop 2



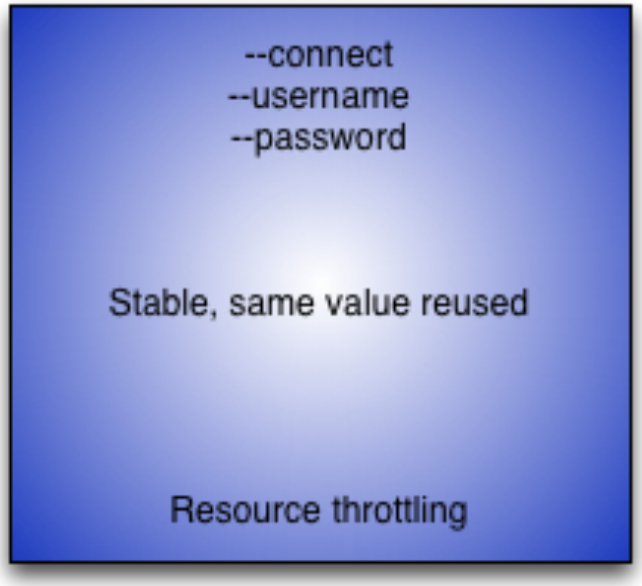
Sqoop 2 – Design Goals

- Security and Separation of Concerns
  - Role based access and use
- Ease of extension
  - No low-level Hadoop knowledge needed
  - No functional overlap between Connectors
- Ease of Use
  - Uniform functionality
  - Domain specific interactions

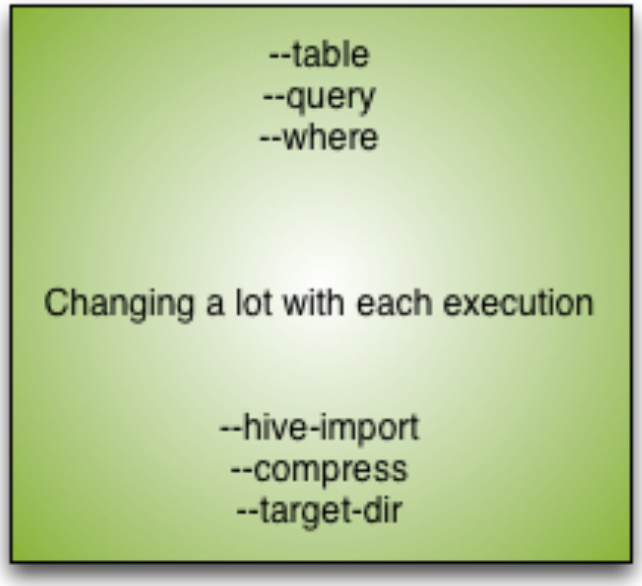
Sqoop 2: Connection vs Job metadata

There are two distinct sets of options to pass into Sqoop:

Connection (distinct per database)



Job (distinct per table)



Sqoop 2: Workings

- Connectors register metadata
- Metadata enables creation of Connections and Jobs
- Connections and Jobs stored in Metadata Repository
- Operator runs Jobs that use appropriate connections
- Admins set policy for connection use

Sqoop 2: Security

- Support for secure access to external systems via role-based access to connection objects
  - Administrators create/edit/delete connections
  - Operators use connections

Current Status: Sqoop 2

- Primary focus of the Sqoop Community
- First cut: 1.99.1
  - bits and docs: http://sqoop.apache.org/

Demo