A CouchDB Replication Endpoint in PHP

FrOSCon 2014

Kore (@koredn / kore@apache.org)

August 23rd, 2014

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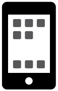
The Idea



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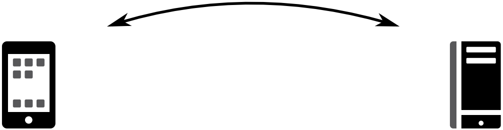

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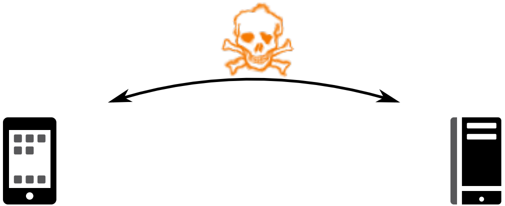

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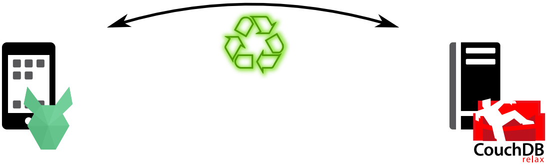

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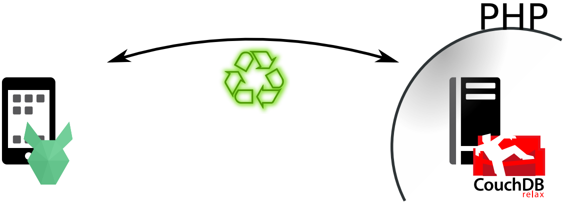

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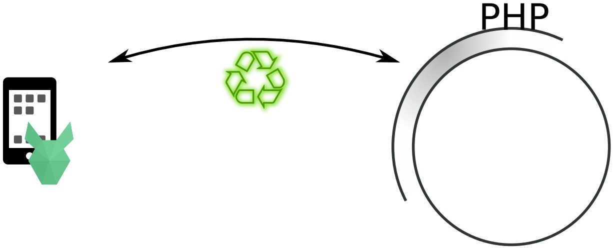

Implementations

- Client
  - PouchDB
  - Hood.ie
  - TouchDB
- Server
  - Apache CouchDB
  - Cloudant
  - PouchDB Server
  - Replipy (Python)
- Replicator
  - Replicate (JavaScript)
  - Replipy (Python)

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Use Cases

- Make your (PHP)-App offline-capable

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Use Cases

- Make your (PHP)-App offline-capable
- Replicate your MySQL-DB into a CouchDB (or vice versa)

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Use Cases

- Make your (PHP)-App offline-capable
- Replicate your MySQL-DB into a CouchDB (or vice versa)
- Adapt data before syncing to mobile

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Outline

Replication Protocol

Implementation

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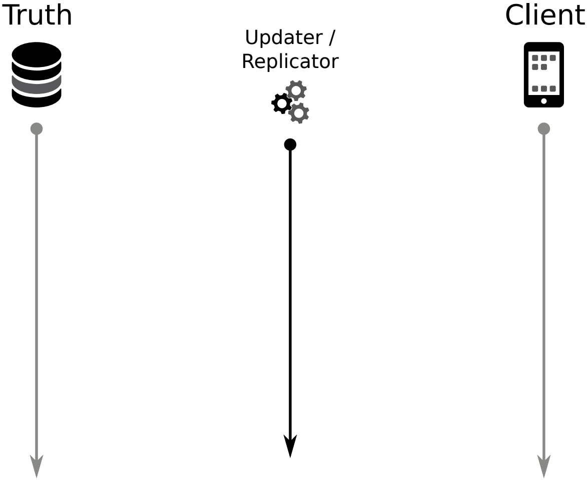
Single Source of Truth



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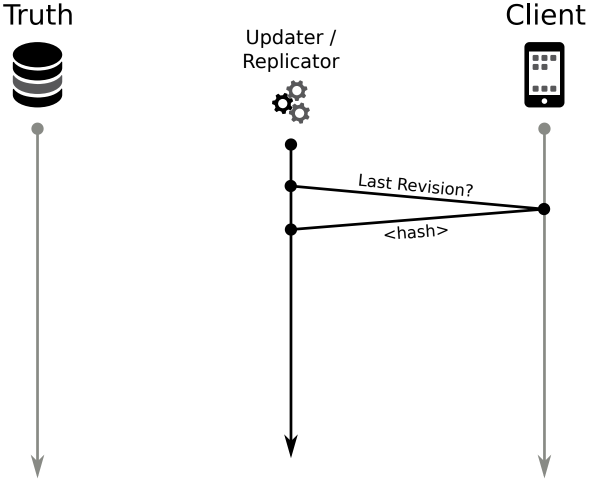

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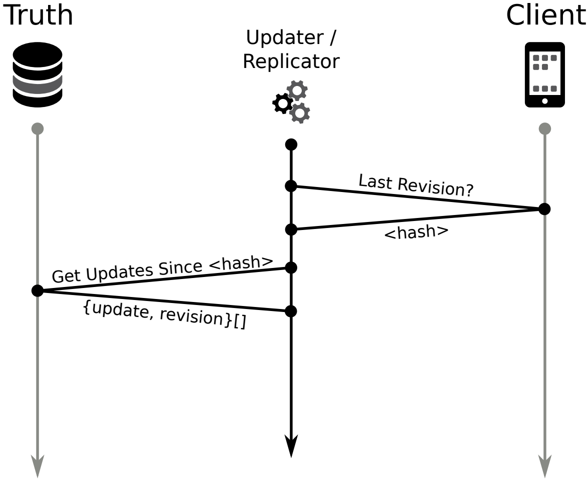

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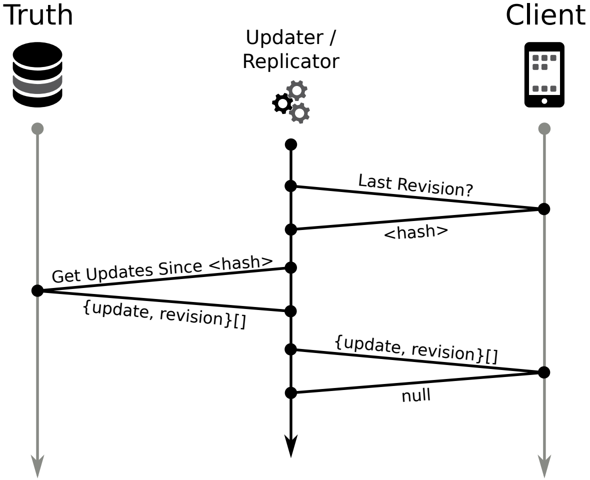

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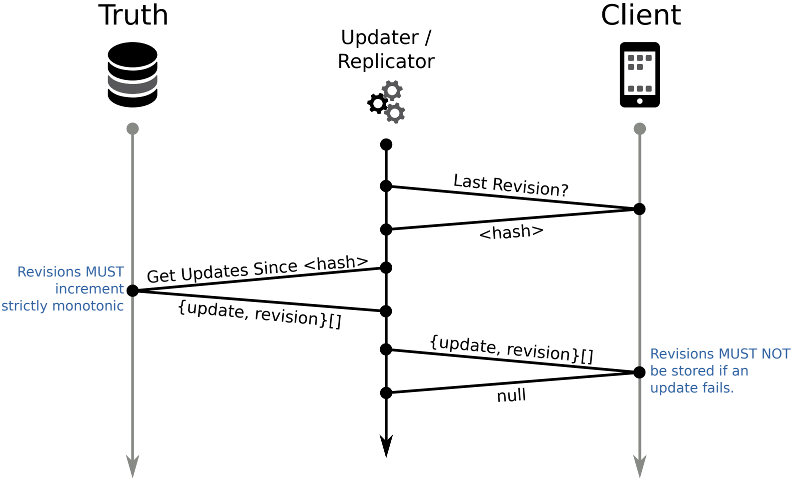

Revisions MUST increment strictly monotonic

Revisions MUST NOT be stored if an update fails.

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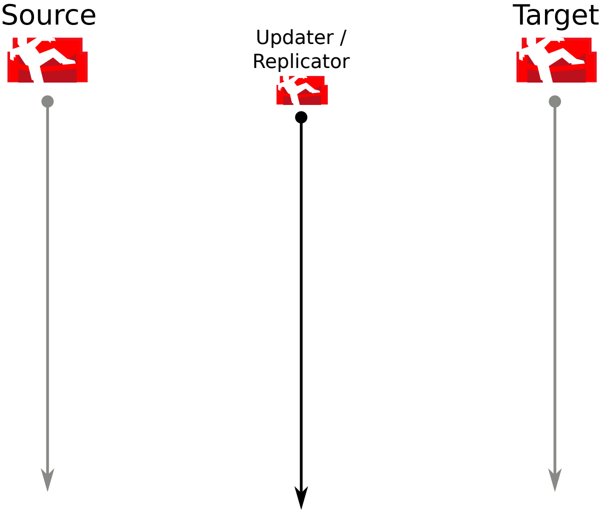
CouchDB (simplified)



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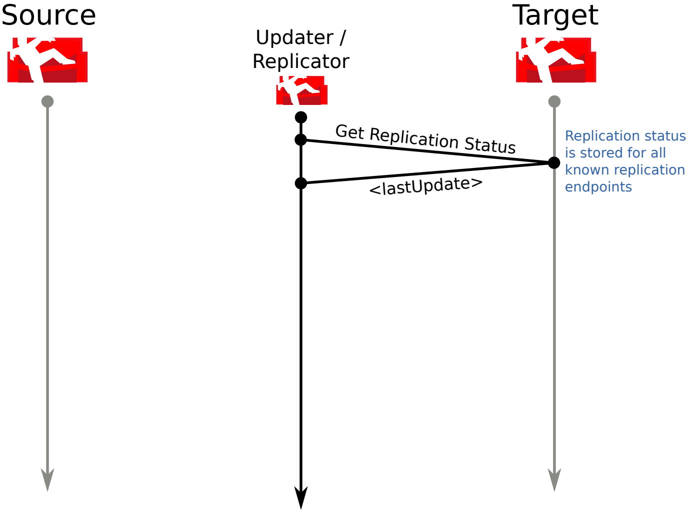

Replication status is stored for all known replication endpoints

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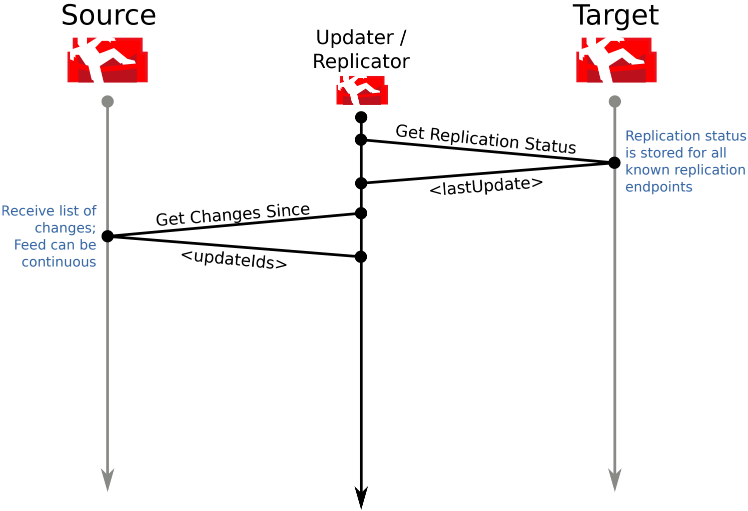

Replication status is stored for all known replication endpoints

Receive list of changes; Feed can be continuous

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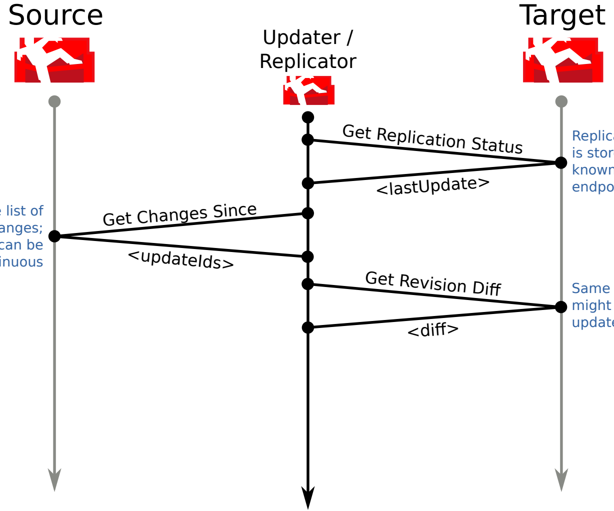

Replication status is stored for all known replication endpoints

Receive list of changes; Feed can be continuous

Same documents might already be updated on target

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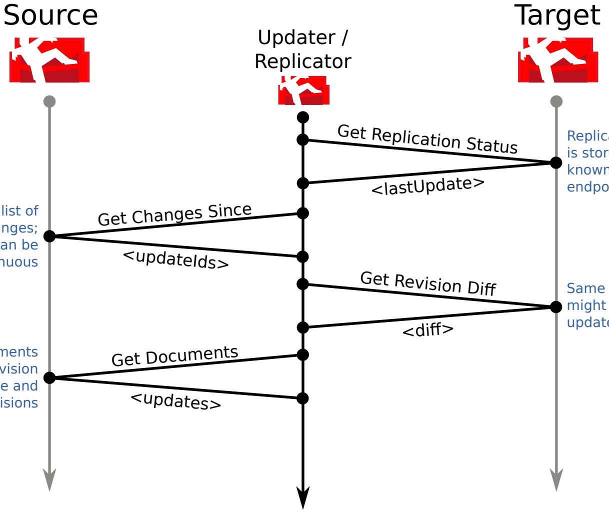

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Get documents including revision tree and all revisions

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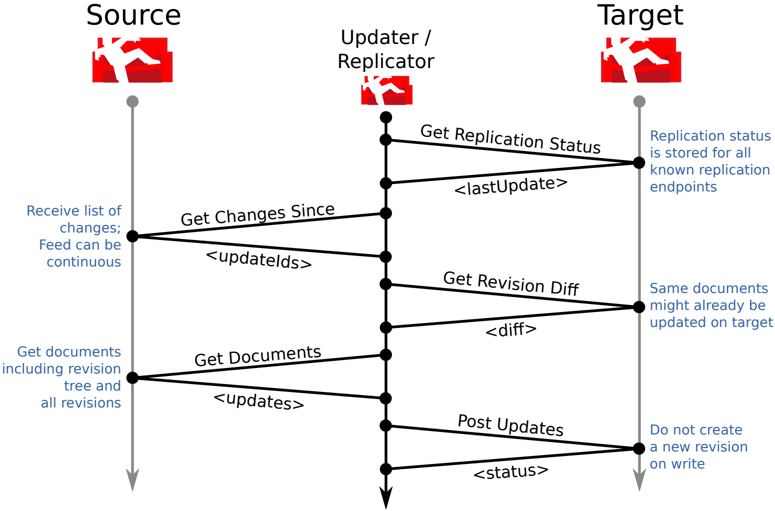

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Receive list of changes; Feed can be continuous

Same documents might already be updated on target

Get documents including revision tree and all revisions

Do not create a new revision on write

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CouchDB

Eventual-Consistent
Multi-Master Replication
over HTTP

Outline

Replication Protocol

Implementation

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How To Test?

1. Record real replication (mitmdump)

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3. Replace Dates and random IDs in requests and responses

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How To Test?

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5. Understand & Refactor

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4. Fix failures
5. Understand & Refactor & Document

- `http://mitmproxy.org/doc/mitmdump.html`
- `https://github.com/Kagency/http-replay`

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How To Test?

Disclaimer:
We will still need Unit Tests to test some of the algorithms dedicatedly.

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Implementation

- Using Symfony2 as a HTTP Framework
  - All logic implemented in framework agnostic controllers / services / repositories

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  - Currently only an in-memory backend is actively used / tested

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Implementation

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  - Currently only an in-memory backend is actively used / tested
- `https://github.com/Kagency/couchdb-endpoint`

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Demo

Replicate a CouchDB database into MySQL

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Conclusion

- Offline-First Eventual-Consistent HTML5 Mobile Apps are the future!

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Conclusion

- Offline-First Eventual-Consistent HTML5 Mobile Apps are the future! *Bingo!*

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    - “Coding Your Dream” by Team Hoodie at 15:15 in C117

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Conclusion

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- Try Hood.ie for prototyping Offline-First Apps
  - “Coding Your Dream” by Team Hoodie at 15:15 in C117
- Use custom implementations to add some sauce

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