Post-relational databases

What's wrong with web development?

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`http://blog.rot13.org`

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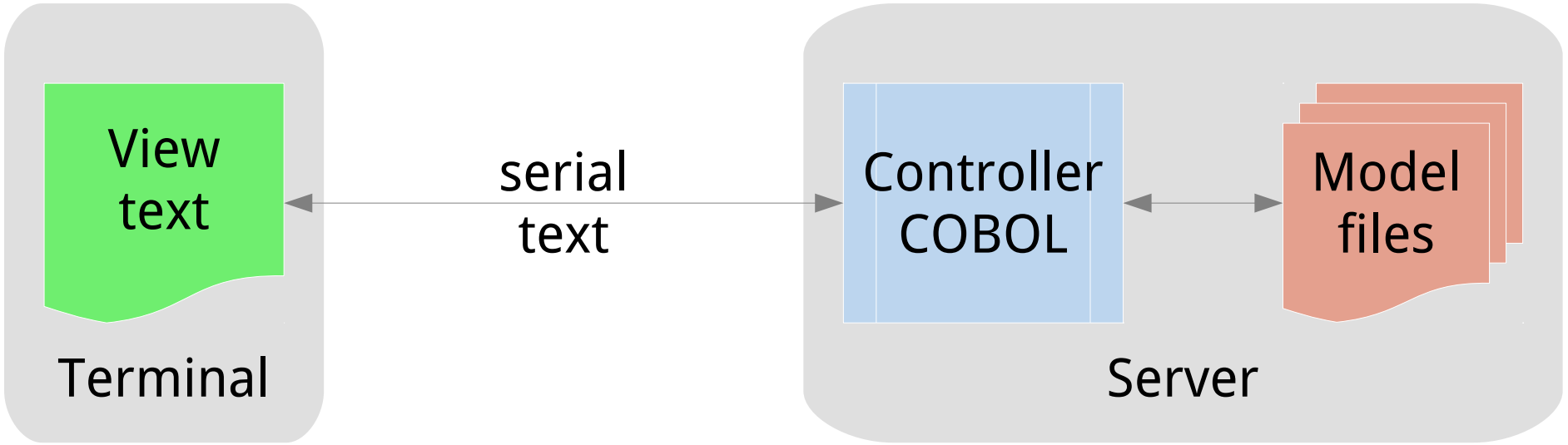
Who am I?

- Web programming since 1995 using FLOSS
- Languages: ~~php~~, perl, JavaScript
- Databases: PostgreSQL, ~~MySQL~~, CouchDB
- 5+ years of expirience as system architect on large intranet content portal
- http://blog.rot13.org

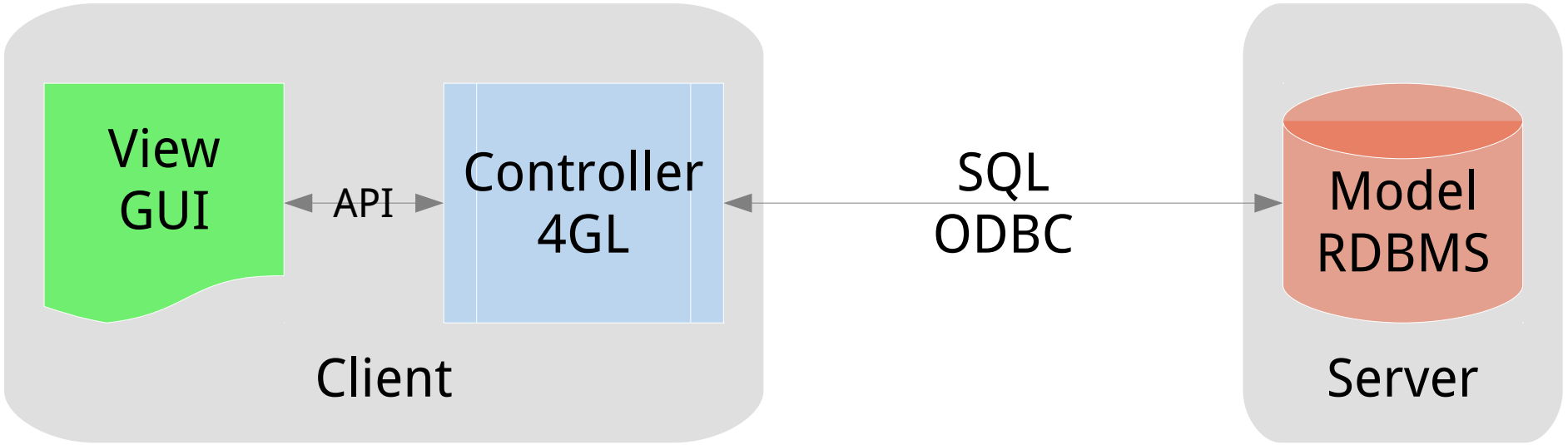
- Big question: **are we solving same problems over and over again?**
- Model-View-Controller pattern

Back in mainframe days...



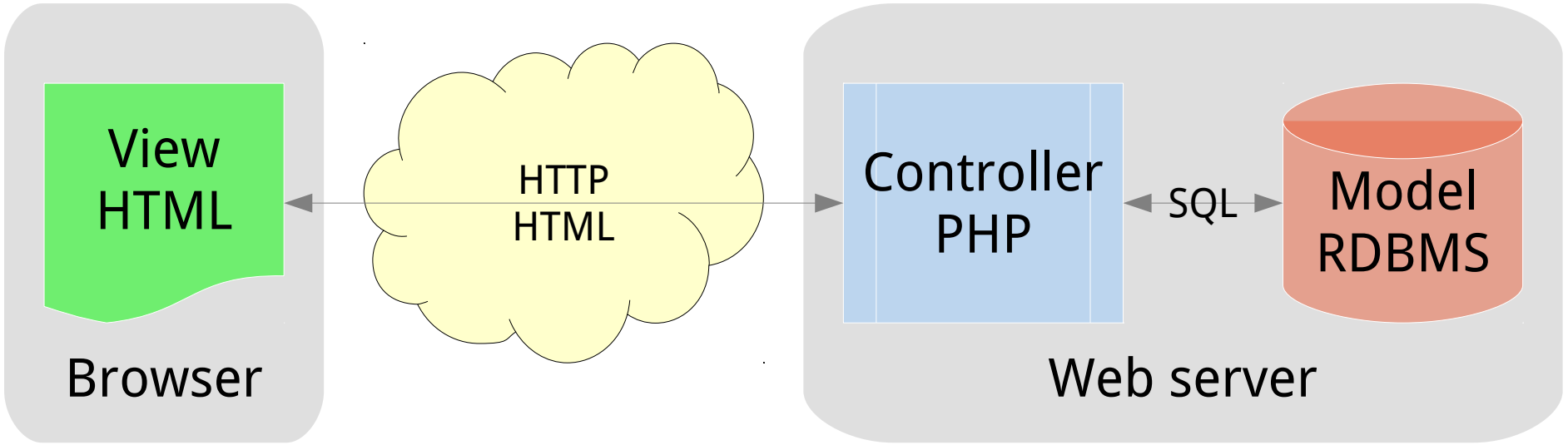
- All logic in COBOL application
- Similar to Clipper in DOS
- Payroll-type applications

GUI Client/Server RDBMS



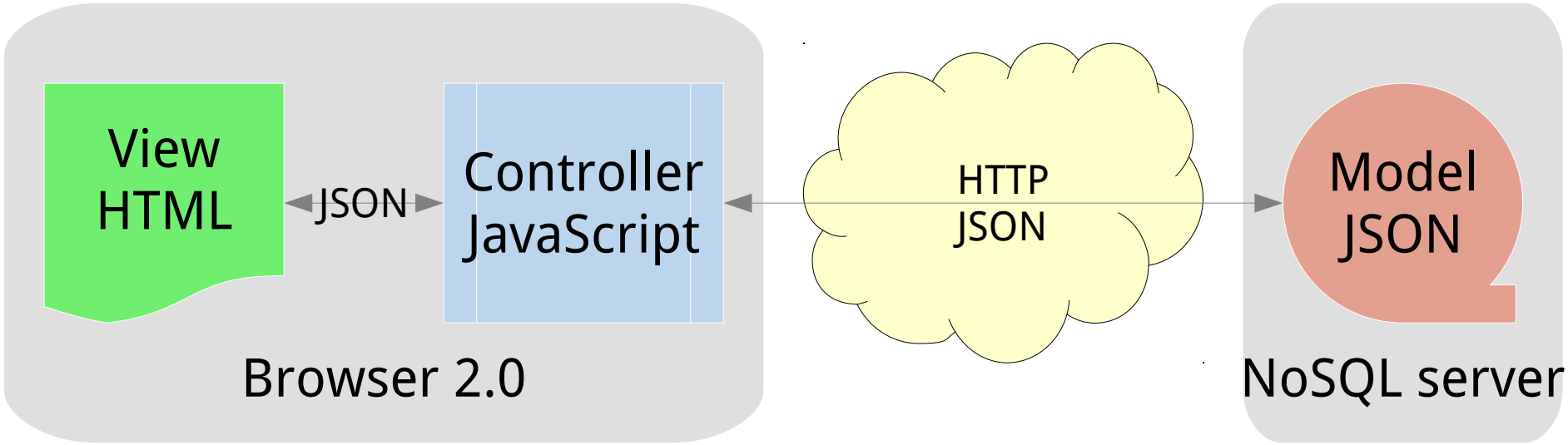
- **tabular** normalized data (3NF)
- SQL to query and modify data (static schema)
- logic in controller and RDBMS (validation)

Internet! Web 1.0



- "network is computer" – browser thin client
- Logic in controller, RDBMS & view (JavaScript)
- Trees (XML)? Self-referencing data?

AJAX JSON REST Web2.0



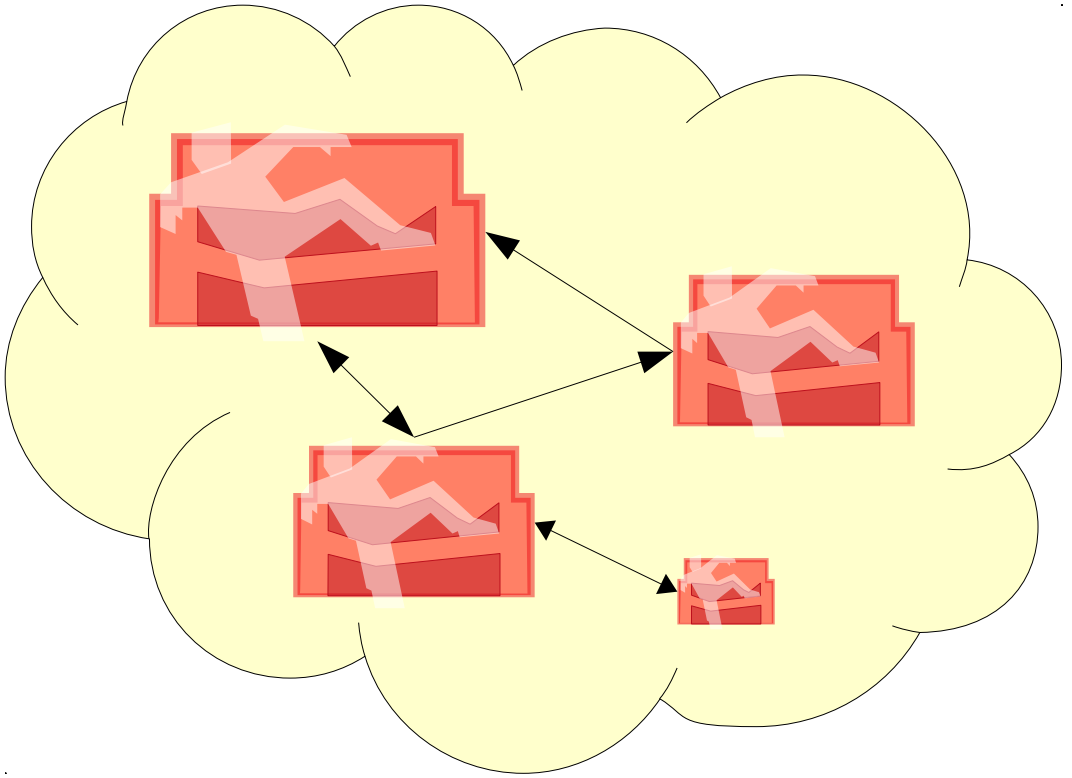
- JSON without schema (or verification!)
- Logic in JavaScript on client **and** server
- Turtles all the way down reduces complexity

Perfect web stack

- HTTP REST API with JSON
  - GET, PUT/POST, DELETE
- JavaScript queries using map/reduce
  - Real-world dirty data from views
- Serve application from HTTP database (content-type support)
- Two-way data binding forms <-> JSON
  - HTML is only template we need!
- Single language: JavaScript (+jquery)
- "simple app in single afternoon" benchmark

CouchDB

- Designed for replication over HTTP
  - applications replicatied with data (off-line)
- Custom views, requests and _changes feed



<angular/>

- What if web browsers where written for web applications today?
  - html compiler inside browser
  - ng:repeat and friends to template objects
  - Objects persisted using REST to server
- http://docs.angularjs.org/

- Demo
  - printer overview
  - conference submission app

angular-mojolicious

- Mojolicious – web in the box (perl)
  - http://mojolicious.org/
- Mojo::Client – chunked HTTP client
  - Perfrect for CouchDB integration
- https://github.com/dpavlin/angular-mojolicious
- REST API for Angular's $resource
  - CouchDB proxy or static JSON files
- Replication with getangular.com service
  - not API compliant, uses newer version
- Helpers to quickly prototype with angular

CouchDB triggers

- Finite-state machine inside document
- Multiple workers - FSM for lock and status
- filter, trigger, commit on _changes feed
- Perfect for async tasks
  - executing shell
  - sending e-mail

CouchDB full-text search

- Implemented as filter-only trigger
- KinoSearch – full-text search, base for Apache lucy (Lucene in C)
- trigger which delete/add documents
  - Unroll structures into.flat.schema
- CouchDB external server to perform queries

CouchDB related projects

- BigCouch
  - https://github.com/cloudant/bigcouch
  - Consistant hashing, sharding
- ElasticSearch
  - http://www.elasticsearch.com/
  - CouchDB river
- GeoCouch
  - https://github.com/vmx/couchdb
  - Spartial index

Riak (search)

- **cluster** of machines!
- Amazon's dynamo model
  - r,w – eventual consistency
- Multiple map/reduce phases in single query
  - Ad-hoc, not cached, in parallel over cluster
- post-commit hooks (search)
- Links (REST traversal)
- HTTP and ProcolBuffers interfaces
- http://www.basho.com/riaksearch.html

Overview

- Avoid complexity
  - Model: JSON
  - View: HTML
  - Controller: angular
- Solve offline problem: CouchDB
  - Attach async processes in the cloud!
- Attack interesting problems
  - Tree-data, (social) networks