

Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

Conclusion

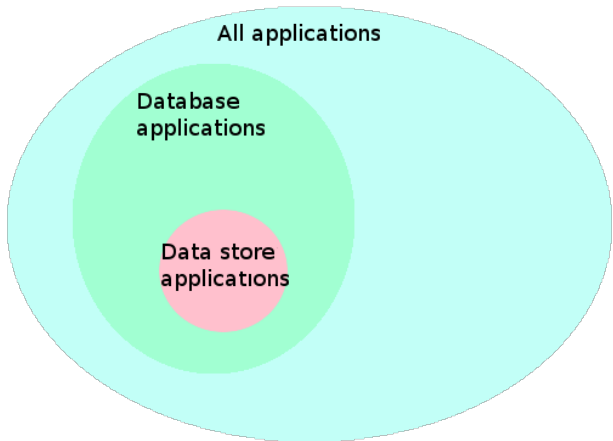
# Coexist: A Minimalist Data Access System

Anthony Naddeo  
Advisor: Sudarshan Chawathe

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# Target application and user

Coexist targets programmers who focuses on a small subset of applications that deal with data storage.



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Example Apps

The Problem

My Solution

Structure

API Overview

API Example

Demo

Database

Replication

Example

Conclusion

# Example data store applications

Workout, diet, inventory and weather monitoring applications likely fall under this category.

Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example





Conclusion





← → ↺ ↻ amethyst.umcs.maine.edu:8080/MeLT/?page=records&option=upload





**MeLT** The University of Maine Farmington  
The University of Maine


**Records**  
Edit and Remove  
Add



**File Upload:**  
You can [download a sample csv file](#) to upload if you don't have any data files on hand


Choose a pond:   
Ledge, Dallas Plantation Maine   


Choose a location:   
surface: Lat: 1, Lon: 1   

Choose a logger:   
Ledge surface   

Add a comment:  winter 2011

Viewable by all users:  

 No file chosen



Day Logs						
EXERCISE	WEIGHT	REPS	REST	TIME	NOTE	
<a href="#">Bench Press</a> May 7	185lb	10	120s	0s		
	185lb	10	120s	0s		
	185lb	10	120s	0s		
<a href="#">Incline Barbell Bench Press</a>	112lb	10	120s	0s		
	100lb	10	120s	0s		
	100lb	10	120s	0s		
<a href="#">Yoga</a> February 17	Click on name for logs					<a href="#">EDIT</a>
<a href="#">Elliptical</a>	Click on name for logs					<a href="#">EDIT</a>
<a href="#">Leg Press</a> March 17	150lb	10	120s	0s		
	150lb	10	120s	0s		
	150lb	10	120s	0s		
<a href="#">Leg Extensions</a>	25lb	12	120s			
	75lb	12	120s			
	50lb	12	128s			
	50lb	12	120s			

2004-03-17

2019-03-17

# The Problem

Target User  
Example Apps

**The Problem**

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

Conclusion

These applications take too long to create!

- Redundant application development
- Single platform clients in popular frameworks
- Application development involves unnecessary coding

# Coexist: API based data access

Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

Conclusion

## Codeless application development

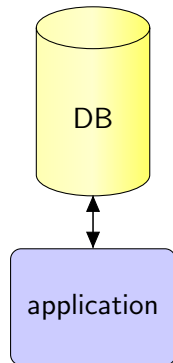
- Provide compatible clients

## Clients for multiple platforms

- Decouple the server and clients

## Minimal development times

- Require only configuration files



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Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

Conclusion

## Codeless application development

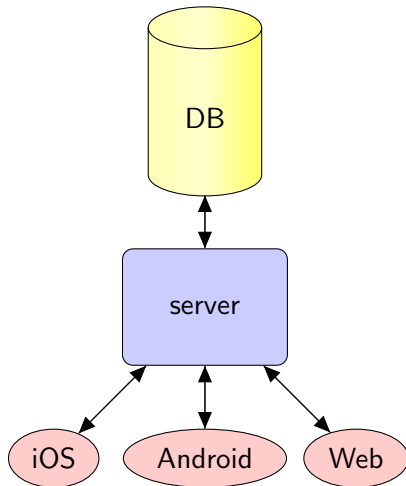
- Provide compatible clients

## Clients for multiple platforms

- Decouple the server and clients

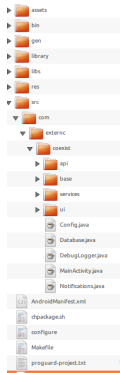
## Minimal development times

- Require only configuration files

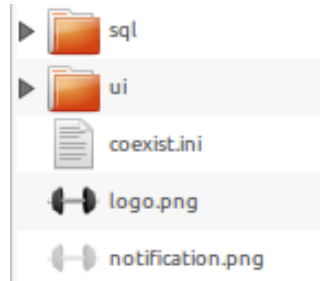


# Coexist at a glance

Target User  
Example Apps  
The Problem  
My Solution  
**Structure**  
API Overview  
API Example  
Demo  
Database  
Replication  
Example  
Conclusion



(a) A single Android project without Coexist. About 4000 lines long.



(b) An entire Coexist project that produces multiple clients. About 15 lines long.

# API Overview

`http://domain.com/api/metamodel`

`http://domain.com/api/schema`

`http://domain.com/api/sync`

`http://domain.com/api/create`

Target User  
Example Apps

The Problem

My Solution  
Structure

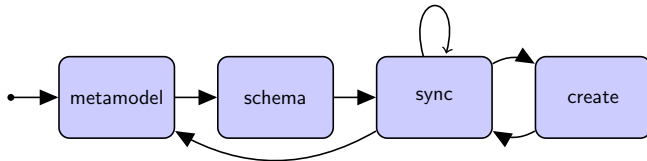
**API Overview**

API Example

Demo

Database  
Replication  
Example

Conclusion





# API Example

Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

Conclusion

workoutlog.externc.com/api/metamodel/

```
{
  status: 200,
  message: "OK",
  version: 2,
  - create: {
    + forms: [...],
    + views: [...]
  }
}
```

workoutlog.externc.com/api/schema/?db="sqlite"

```
{
  status: 200,
  message: "OK",
  version: 2,
  + sql: [...]
}
```

# Demo

Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

Conclusion

The screenshot shows the 'Workoutlog' app interface. At the top, there's a title bar with a back arrow, the text 'Workoutlog', and a menu icon. Below the title bar is a list of categories: Exercises, Add sets, Body Parts, Foods, Measurements, Diet, and Daily protein. The 'Add sets' category is highlighted.

The screenshot shows the 'Add sets' app interface. At the top, there's a title bar with a back arrow, the text 'Add sets', and a menu icon. Below the title bar is a form with the following fields: Your name (anthony), Exercise (standing ez curls), Set number (5), Number of reps (6), Weight (90), and Date (2013-4-29). The 'Add' button is highlighted in green.

The screenshot shows the 'Add sets' app interface. At the top, there's a title bar with a back arrow, the text 'Add sets', and a menu icon. Below the title bar is a table with the following columns: Your name, Exercise, Set number, Number of reps, Weight, and Date. The table contains 7 rows of data.

Your name	Exercise	Set number	Number of reps	Weight	Date
anthony	standing ez curls	5	6	90	2013-04-29
anthony	standing ez curls	4	6	90	2013-04-29
anthony	standing ez curls	3	6	90	2013-04-29
anthony	standing ez curls	2	8	70	2013-04-29
anthony	standing ez curls	1	6	70	2013-04-29
anthony	incline skull crushers	5	10	70	2013-04-29

# /api/sync: Database replication

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Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

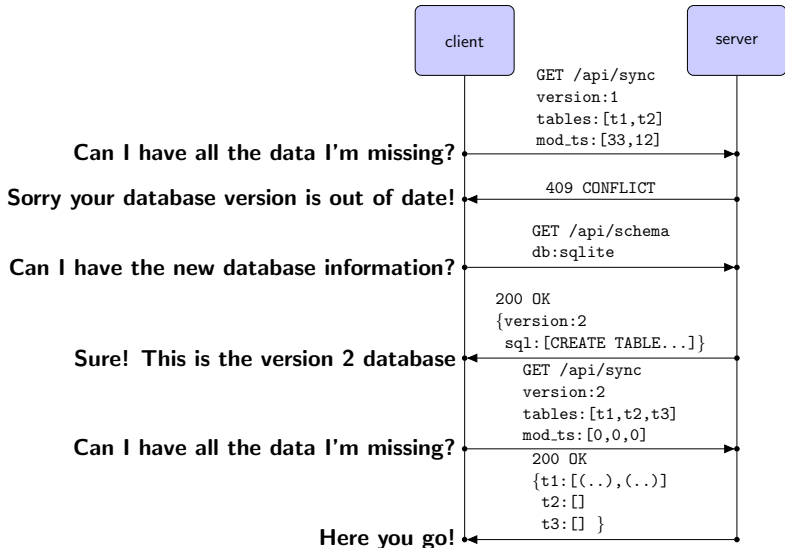
Conclusion

*metacolumns*: typical SQL columns that are used for some application level purpose.

id	name	year	<i>mod_ts</i>
1	Alice	4	0
2	Bob	4	10
3	Carol	3	0
4	Dan	4	10

- The *mod\_ts* column contains the most recent update on that tuple
- Allows the server to give clients missing information when supplied with most recent client side *mod\_ts*

# Sample client - server dialog



# In Conclusion

Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

Conclusion

- Drastically reduces the amount of code required to produce data store applications.
- Create clients for the web, Android and more without any additional work.

Thanks to my advisor, Sudarshan Chawathe

# Authentication

Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

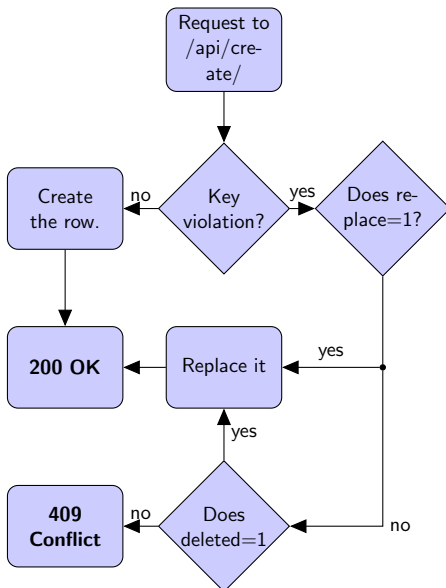
Demo

Database  
Replication  
Example

Conclusion

■  $sha1(version + T + M + username + sha1(password))$

# Handling deletes



Target User  
Example Apps

The Problem

My Solution  
Structure

API Overview  
API Example

Demo

Database  
Replication  
Example

Conclusion