CabFriendly: A cloud-based mobile web application stack.

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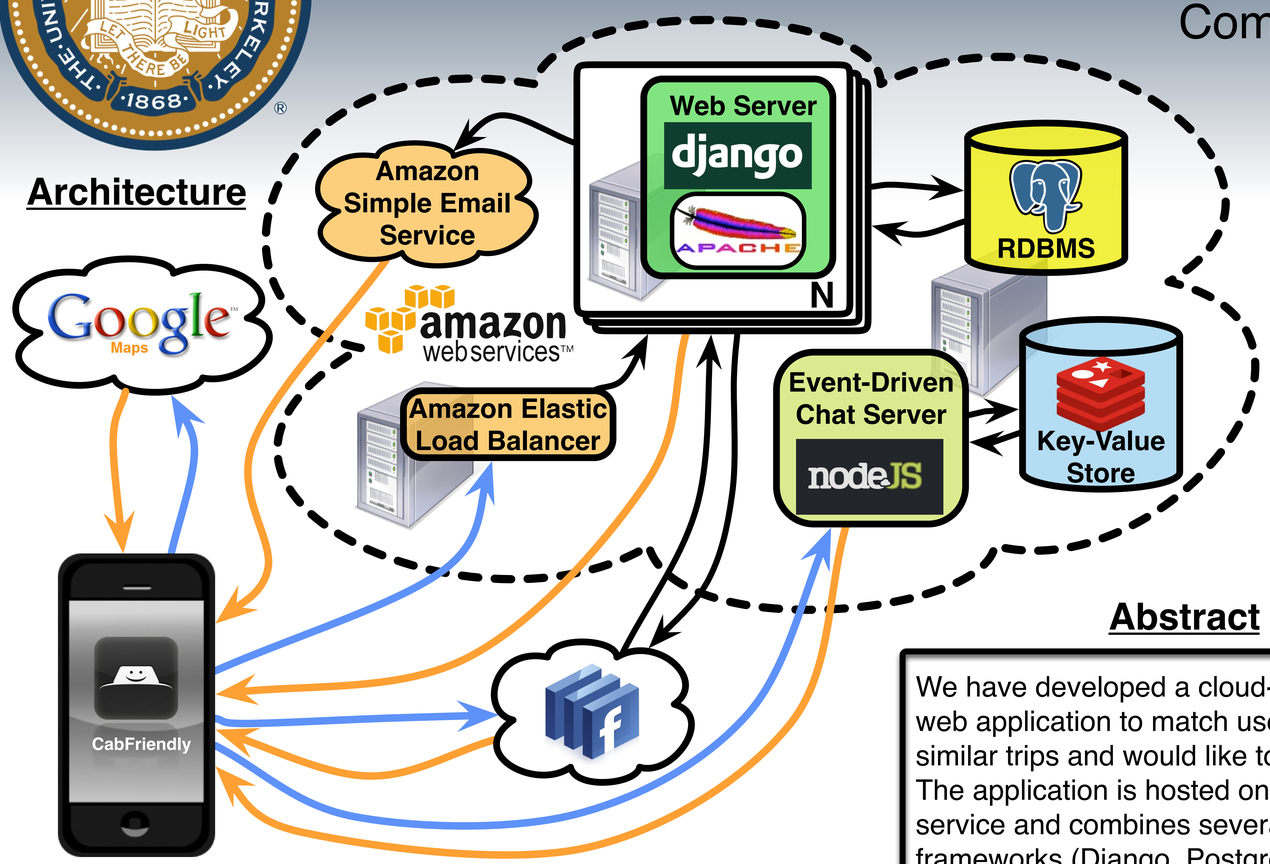
Architecture

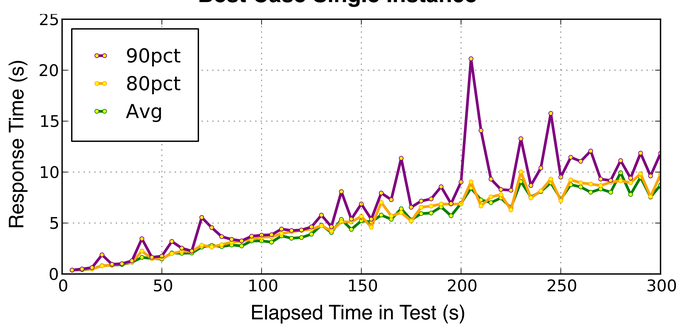


Abstract

We have developed a cloud-based mobile web application to match users who request similar trips and would like to share a cab. The application is hosted on Amazon's EC2 service and combines several open-source frameworks (Django, PostgresQL, Redis, Node.js) with social networking (Facebook), mapping, and location-awareness (Google) APIs. The modularity of our design allows the service to easily scale in the cloud as the user base grows.

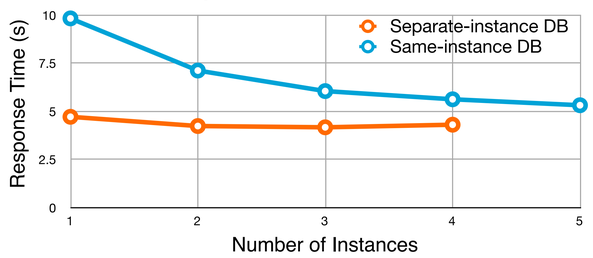
Performance Analysis

Best Case Single Instance

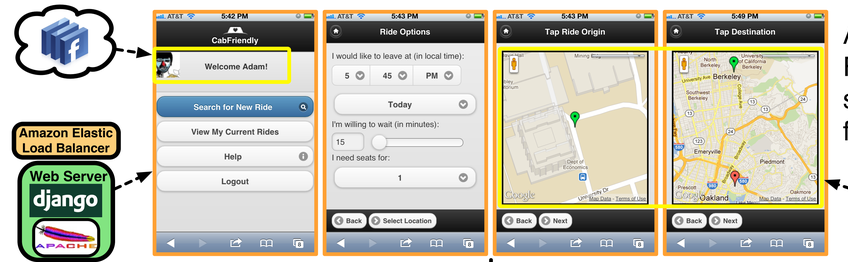


Response times for 50 simulated clients, ramped up at a rate of 1 thread every 5 seconds. The clients generate random ride parameters to simulate the "best case" where matches are minimized.

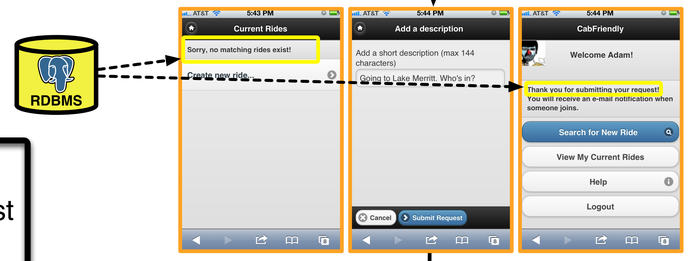
95 Percentile Response Time vs. Number of Web Servers



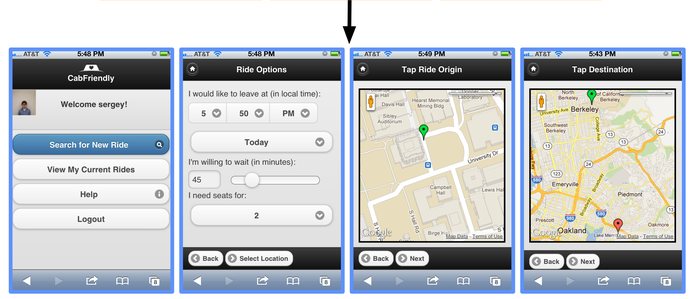
Example Workflow



Adam logs in via Facebook and inputs search parameters for a desired trip.

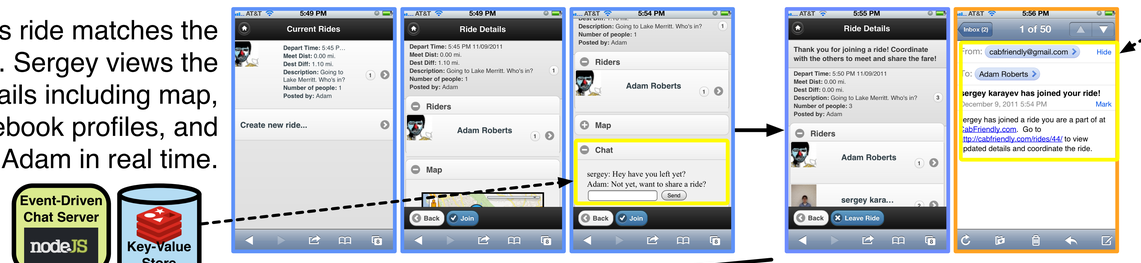


When no matching ride is found in the database, he enters a description and submits a new ride request.



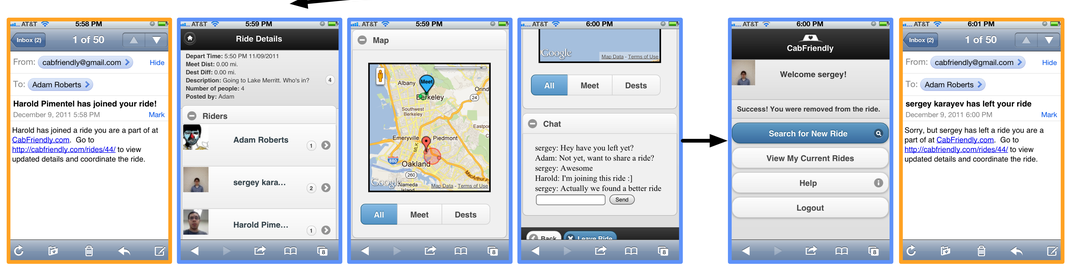
Sergey logs in and inputs his search parameters.

Adam's ride matches the request. Sergey views the ride details including map, rider Facebook profiles, and chats with Adam in real time.



Sergey adds himself to the ride, updating the database and causing an e-mail notification to be sent to Adam.

Harold joins the ride, prompting notifications to Adam and Sergey who can view the updated ride details and chat with Harold.



Sergey leaves the ride, and Adam and Harold are notified.