

BYU Parking Gossiper

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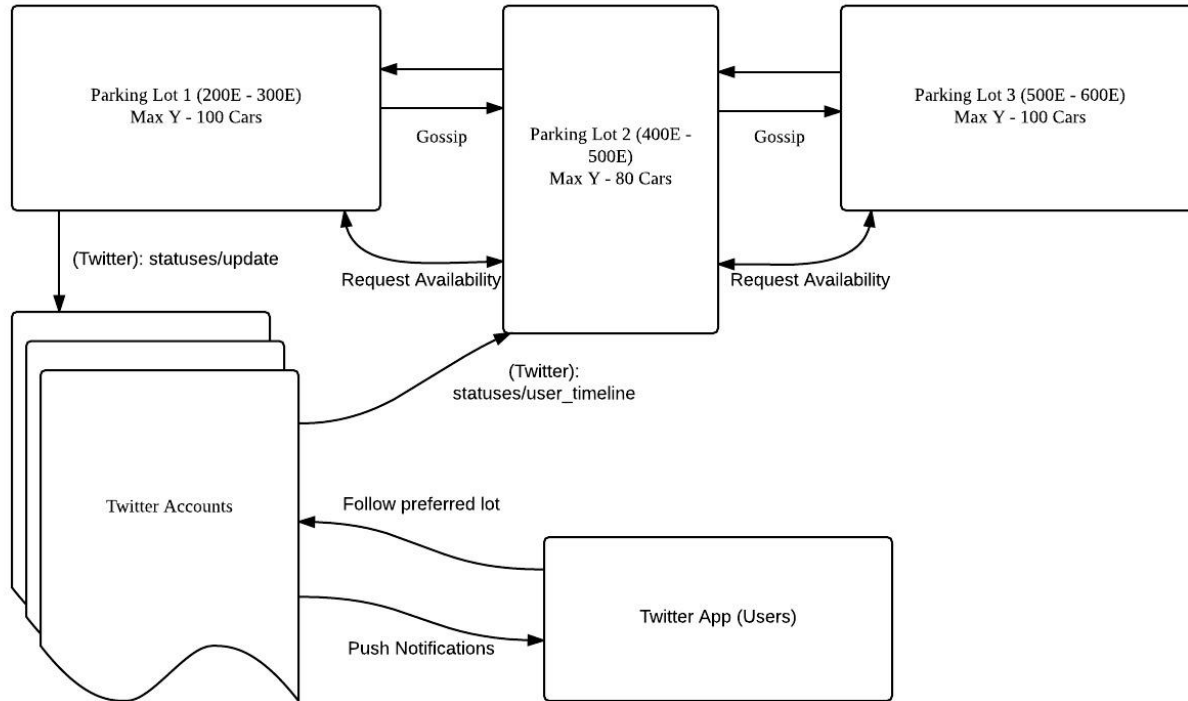
Problem

Students sink a lot of time each day into simply finding parking spaces.

- Parking sharks circle lots waiting for spots to open and end up late to class
 - There may be spots available in a nearby lot
- We want to know what time a lot fills so we can adjust to make it there before it fills.
 - This could introduce new problems where the lot fills earlier and earlier as students compete to get there before it fills

Gossip Protocol Driven Parking Lot Availability App

Design models how the app would function with just the 3 Y lots on 800 North



Design

We are creating an app that tells twitter “Parking Lot” accounts how many spaces are still available in the parking lot.

- Each parking lot has a twitter account
- Lots tweet availability on 5 minute intervals if traffic is high or a full lot becomes available.
- When a lot fills, it tweets its nearest neighbor with vacancies
 - “800N 500E Lot is full! Check [@800N400E](#), it has some open spots”
 - “800N 500E has 5 vacancies.”
- Users can follow the lot(s) they prefer most.

Design cont...

Each lot knows its two nearest neighbor lots

- These lots have to be connected by some admin using our web client
- Every time a lot occupancy changes, it propagates an occupancy rumor to its neighbors.
 - Each lot only knows between two and four neighbors.
 - If all of a lot's neighbors are full, it will send a link request to its neighbors asking them if they know any lots with vacancies
 - The lot will tweet the link given by the closest neighbor that responded with an open neighbor.
 - Lots only tweet when they are rapidly filling and then once when they fill.
 - After filling, a lot will not tweet again until it has a vacancy.

Component APIs

In-App:

- AvailabilityRumors
- AvailabilityRequest

Twitter:

- OAuth - register bot to twitter acct
- POST statuses/update - tweet availability
- GET statuses/user_timeline - check for overriding admin posts

Problems

In the scope of the semester, we cannot actually implement the hardware to track incoming and outgoing cars.

- We are simulating car flow with a timed function that fills the lots deterministically.

Most lots have some mix of Y, G, and A spaces.

- We are assuming just Y permits and spaces for the project's scope.