

Mobile Phone design Application and Design Competition

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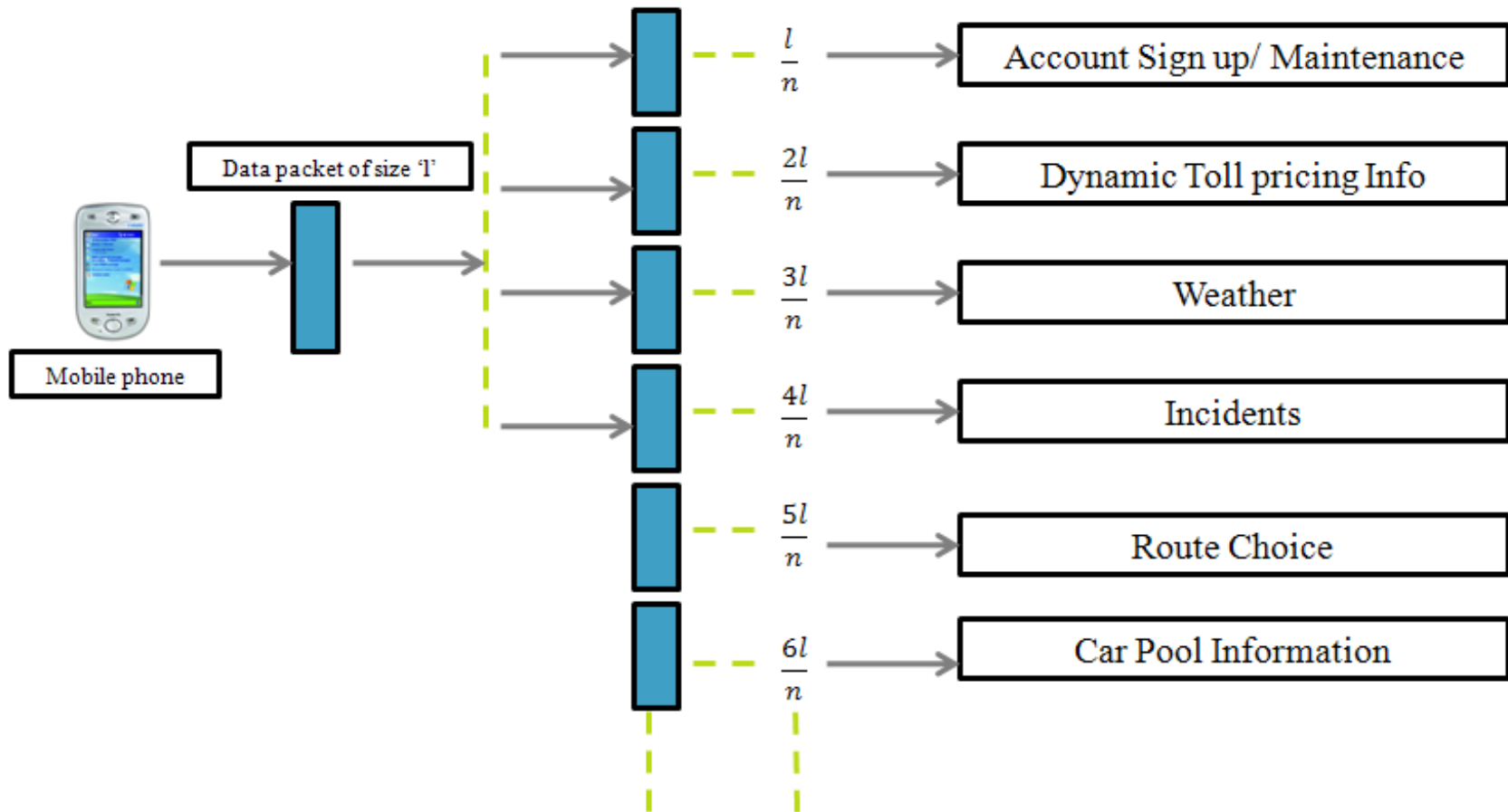
Motivation

- Constant growth in the available API's
- Shift in customer interests?
- Customers these days expect the mobile devices to be able to connect to the internet
- Communicate timely information effectively

Challenges

- Most of the existing API's are not developed for mobile application
- Bandwidth
- Memory and CPU ability
- Battery life
- Storage capacity
- Security
- User interaction and display
- Connectivity

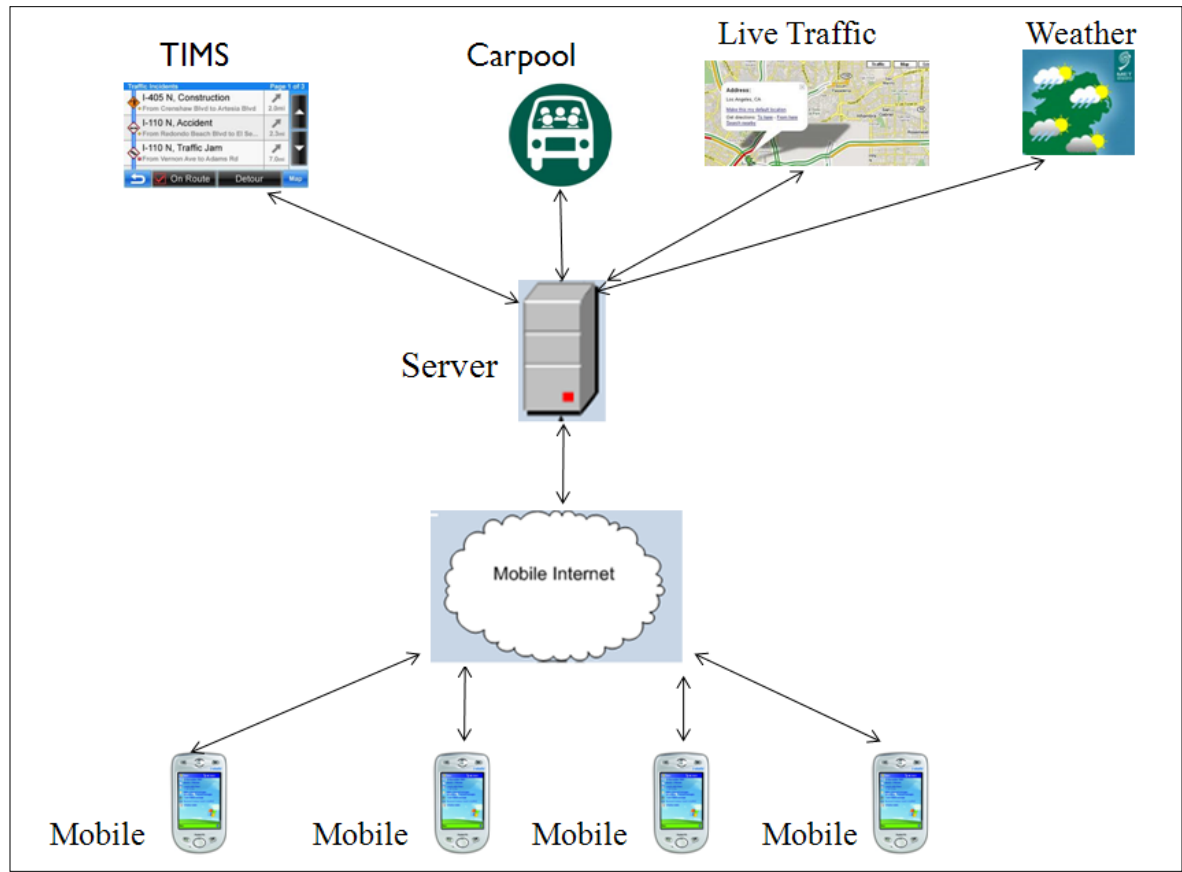
Data Packet Structure



Advantages and Implementation

- Operator can incorporate more data types in the future without disrupting the existing one
- Protocol Buffers provides an optimal way to encode structured data

Current Architecture



Benefits

- Allows the operator (Turnpike Authority) to control the interface between the user and the web service
 - Avoids the need to update many devices
 - Controls the data format to the device
- Adding or changing service providers is much easier as changes are done on the server not on the mobile devices
- Provide usage statistics on how it's being used
 - What part of the city has maximum queries?
 - What is the peak time for queries?
 - What are the most common queries?

Incident/Emergency Alerts

- What is the best way to communicate this information?
 - Pulled driven communication protocol (customer requests for the information)
 - Event driven communication protocol (Information is sent without customer intervention)
 - Event driven protocol should be used to achieve this object

Incident/Emergency Alerts

- What is the best way to retrieve incident data?
 - Division of Traffic Incident Management at NCDOT made Incident database available for *Simple Object Access Protocol (SOAP)*
 - Information that can be retrieved
 - Current active alerts for a specific county
 - All active incidents in the entire state
 - Load all currently active incidents from a county
 - Incident information by route
 - Retrieve all currently active incidents for all counties in a region
 - Currently active statewide special alerts
 - NCDOT made source code for SOAP available

Example of Live Communication



Causes for Travel time Unreliability

- Work zones
- Traffic incidents
- Special events
- Demand fluctuations
- Traffic control devices (signal control, stop control etc)
- Weather
- Inadequate base capacity

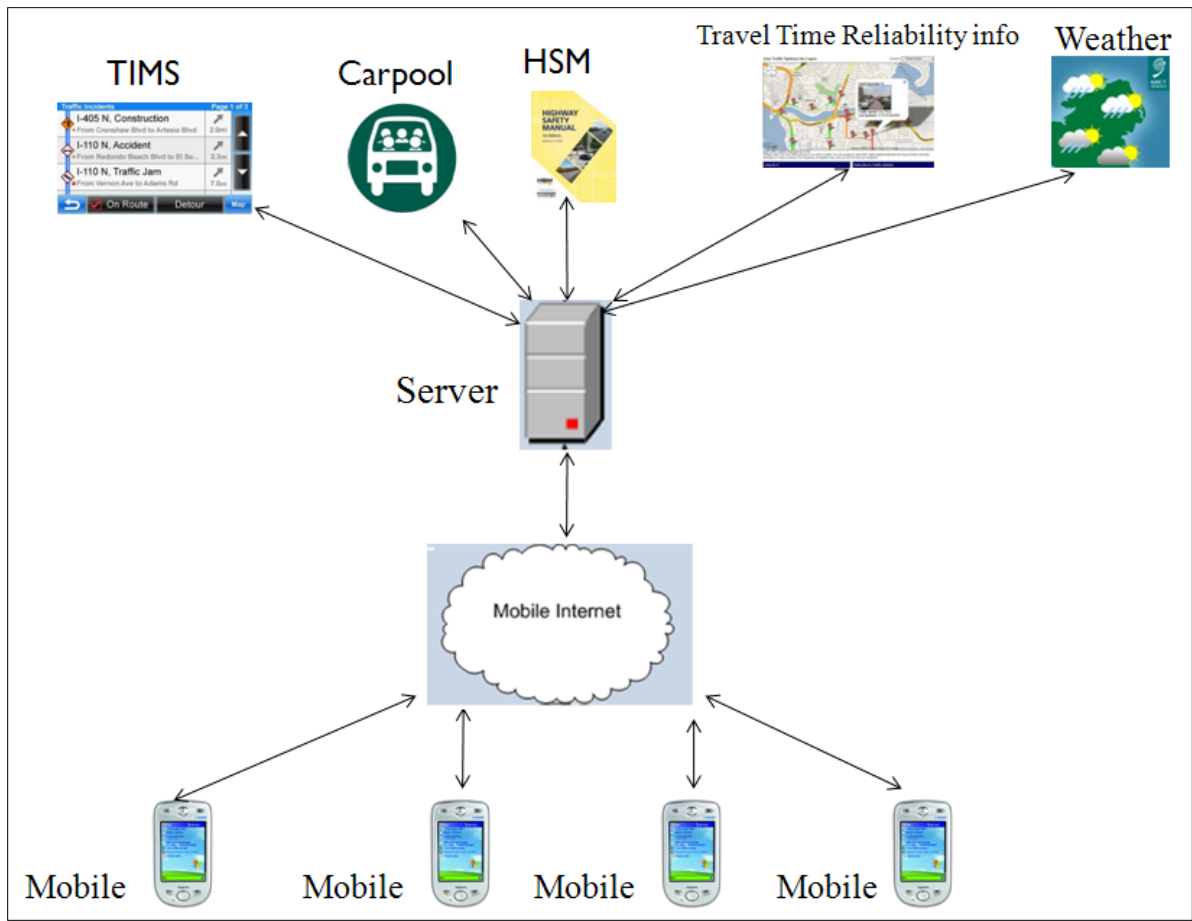
Future Transportation Research

- National Academy of Sciences (NAS) initiated a ‘Strategic Highway Research Program’ (SHRP-2) to address the issues of safety, renewal, reliability, and capacity of highway systems
- Projects of Interest
 - *L-02 (Establishing Monitoring Programs for Mobility and Travel Time Reliability)*
 - *L-12 (Improving Traffic Incident Scene Management)*
 - *L-14 (Traveler Information and Travel Time Reliability)*
- The framework for computing reliable travel times will be made available for Transportation Community

Highway Safety Manual

- Safety Models in HSM will be validated in the next few years
- ‘Safety of the Route’ can be incorporated into the existing mobile application

Future Architecture



Customer Benefits

- Account Sign up
- Balance monitoring & auto renewal (automatically send a message to the customer, when the balance in his/her account goes below minimum)
- Dynamic toll rate details
- Travel time information
- Emergency Alert notifications
- Weather alert
- Carpool information
- Safety Information
- Customer service

Thank You