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Scenario of Intelligent Transportation System
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Abstract

This document discuss the scenario of intelligent transportation system.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

Status of This Memo

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1. Scenario of Intelligent Transportation System Mobile Applications

This document introduces several intelligent transportation system mobile applications. From those applications, we analyze the scenario and requirement of intelligent transportation system.

1.1. Waze

Waze (https://www.waze.com/) is a community-based traffic and navigation application. The drivers who use waze can share the traffic related event to other waze users. Traffic related event includes traffic jams, accidents, road hazards etc. It uses the idea of UGC (User Provided Content) to generate real-time traffic map. Waze users can also communicate with each other using the waze platform. For example, a group of friends that have the same destination can share their location to coordinate everyone’s arrival times.

Waze architecture is shown in figure 1.

preamble to the figure.

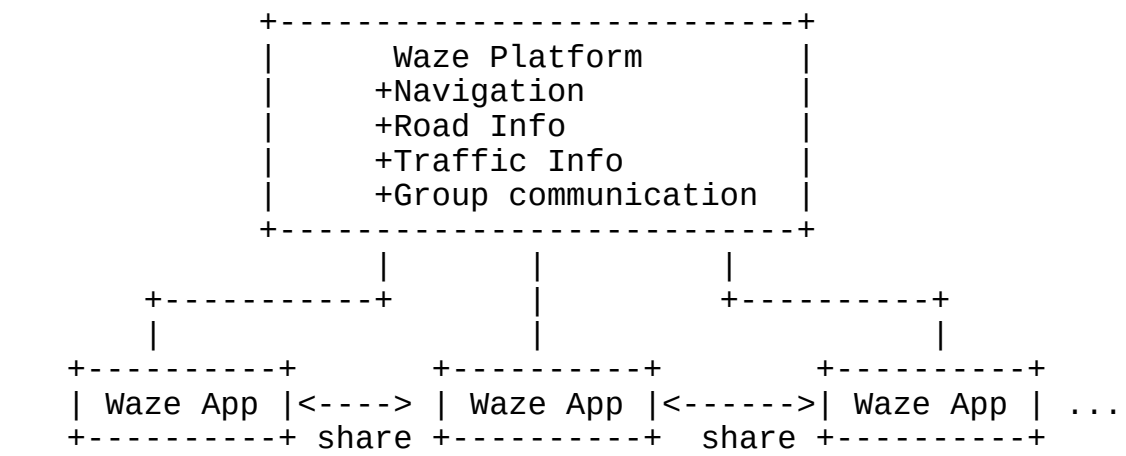

Figure 1: Waze architecture

Summary of the Waze architecture

- o There is a centralized waze server that collect the road and traffic information.
- o Waze application can communicate with each other through centralized waze server.
- o Waze application’s communication is based on TCP/IP.

1.2. iRezQ

iRezQ is another mobile application in the ITS field. Its main use case is for driving safety. The iRezQ mobile application running on the driver’s mobile phone can monitor the vehicle’s speed to detect whether there is a collision. When collision is detected, iRezQ application can dial the emergency call automatically. The architecture of iRezQ architecture is shown in figure 2.

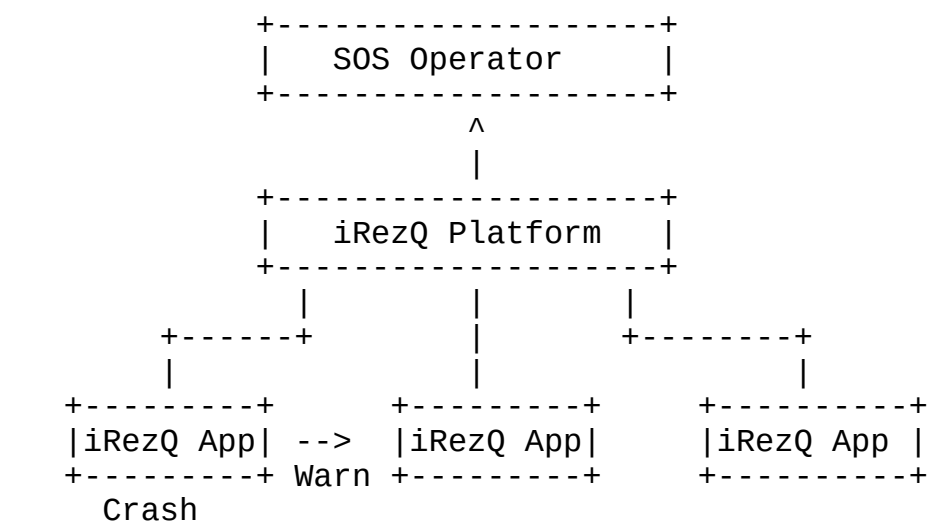

Figure 2: iRezQ architecture

Summary of iRezQ architecture:

- The iRezQ mobile application is used to detect whether there is a collision occurs. It uses the sensors in the mobile phone and certain algorithm to determine whether there is a crash happening.

- If there is a crash detected by iRezQ mobile application, it will warn the driver and sent out iRezQ-Warning message to all the nearby drivers who are using iRezQ mobile application. The nearby iRezQ users will receive a "WARNING! ACCIDENT NEARBY" message. It will prevent the nearby drivers running into the collision again and result in a second crash.

- For premium member, iRezQ mobile application will alert the iRezQ emergency rescue center where an operator can see the driver’s position and breaking pattern presented i a graph. The iRezQ rescue center will try to reach the driver if they suspect a true accident.

1.3. Sentinel

Sentinel is security system used in Dakar rally. It is a security system that alerts the drivers and riders about imminent overtakes or accidents. It beeps and glows to warn the rider that he is going to be overtaken. It alerts the participant who’s being overtaken when there are 200m between two vehicles. The architecture of sentinel is shown in figure 3.

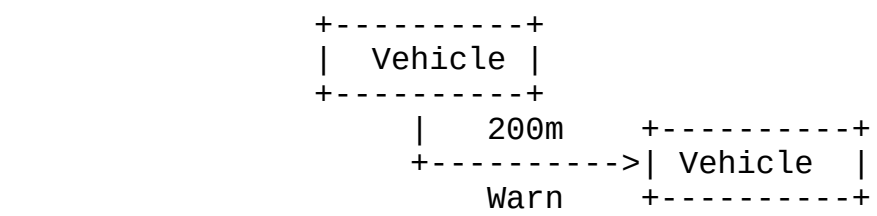

Figure 3: Sentinel architecture

Summary of sentinel architecture:

- There is a vehicle to vehicle distance detection/communication in sentinel architecture.

1.4. COYOTE

Coyote System is a provider of community-based driving assistants. Coyote provides real-time information on speed limits, road hazards and traffic conditions to the coyote users. The architecture of coyote is shown in figure 4.

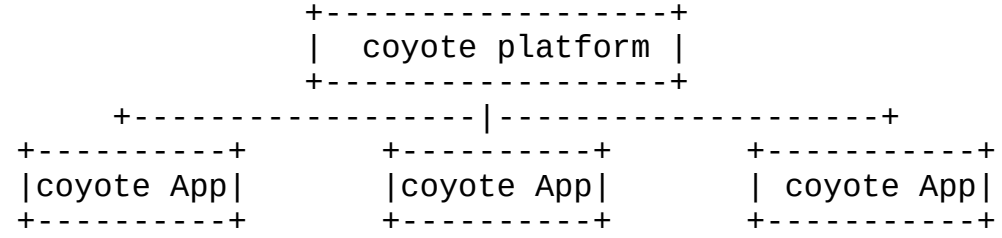

Figure 4: Coyote architecture

Summary of coyote architecture:

- Coyote has similar architecture as Waze. Coyote users can share traffic information to coyote platform and the coyote platform can share the traffic information to other coyote users.

2. Communication Requirement of ITS Application

This section discusses the communication requirement of ITS application. Section 1 introduces several ITS mobile applications. From the analysis, we can conclude that:

- All the communication between the ITS mobile application and its backend server is based on IP.

- For some of those ITS applications, there is no direct communication between the ITS mobile applications but there is communication between ITS applications through the backend server.

- For some ITS application, for example, Sentinel, there is a requirement of direct communication between vehicles.

IP provides the most flexibility from the developer's perspective. There are plenty of developers that are familiar with developing application based on TCP/IP. If there is a direct IP connection between vehicles, it will help the developers to develop more innovative and useful applications.

3. IANA Considerations

This document makes no request of IANA.

4. Security Considerations

TBD

5. Acknowledgements

TBD

6. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

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