

Video Streaming and Distribution over VANETs using Cloud Service

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Abstract: The number of Smartphone users and mobile applications offerings are growing rapidly. Smartphone's are often expected to offer PC-like functionality. Today's Smartphone's are mostly used for internet chatting, audio-video entertainment etc. All these functionalities can be used together to serve the human being for its well being, safety and time, fuel saving, and most important of all it can be used to save valuable human life. So we developed an application - Live video streaming and distribution over VANET - VANETAndorid using cloud service. In this application, we propose to provide users with application to capture and broadcast video. In this application User captures video which will be uploaded to Central server. Central server shall broadcast the video and other users can view it Live or download it and view offline. User can view location of uploaded video on Google map. He/she can also create watch-list of videos of their choice.

1. Introduction

In today's real world there are situations like accident, fire, riots, and rallies. These require immediate and very specific response. For example, if there is fire on 11th floor of a tower, then with current reporting system a socially responsible citizen would make a phone call to fire brigade and report about incident saying – "There is a fire on 11th floor in Laxmi apartments on MG Road". The information provided by person on call is insufficient to rate incident and respond accordingly.

Incident validation – We have to assume that caller is telling the truth and incident has occurred at the reported location.

Intensity – It is difficult to judge the intensity of incident based on a call.

Response pattern – Based on a phone call, governing body cannot decide intensity and pattern of response.

With VANET Andorid live streaming of captured situation governing body gets to know

- Location of video
- Gravity of situation
- Response strategy

In that case user only known that accident is happened but he doesn't know actually where the accident is happened, roads are blocked or not, how much the traffic is, is there long queue of vehicles or not, on that spot police come to solve the problem or not, is there alternate route to go. These are the entire problems which are not solved by using previous options, so we had to develop the application to solve these problems.

2. Video Streaming in Real World

Presently there are applications which have video streaming facility such as youtube.com. It provides functionality of viewing video which are all ready stored on their server. It does not provide facility if Live video streaming. VANETAndorid provides functionality of viewing video which is being captured at that time. Our application has simple UI which is easy to understand. Our application provides one time user registration and also provides video broadcasting and viewing of broadcasted video. Watch-list is used to see the video of particular category and Google map used to see the location of video.

3. Platform Selection

With the above idea in mind the available platform were analyzed for our application. The regular features of phone will not allow or support third party application hence making any kind of experiment on them is tough task. Also, the goal of providing an open source application direct towards android as most suitable platform for this application. Along with strong embedded java coding, increasing sophistication, enhanced features and simplified user interface, android is ranked high by

programmers as well as user. Platform like iPhone would not allow for open source application development, hence selection of this platform we create bottleneck as it raise proprietary issue. Hence android was chooses as a platform.

Take-up of Google's android Smartphone operating system is growing tremendously worldwide. Android powers hundreds of millions of mobile device in more than 190 countries around the world. Google mobile chief Andy Rubin tweeted, "There has been half a billion android activation to date, with over 1.3m added every day. Android has worldwide Smartphone market share of 75% during the third quarter of 2012"

4. System Requirements

VANETAndroid is supported on devices having Android OS v2.3.3 (Gingerbread) and above. CPU speed at least 600MHz required. Availability of internet connection is necessary for all data transfer and processing work.

5. Module Details

5.1 User Registration

In our project we provide one time user registration in which we store username, IMEI no of user mobile & IP address. IMEI no is automatically fetched from user mobile.

5.2 Broadcast Video

There are seven type of category to broadcast video. User select any one category any broadcast video over that category. There is also another function of sharing video in which video can share with everyone and registered user. Broadcasted video is stored on central server.

5.3 View Video

Broadcasted video can be viewed from list of available videos. User can select the video category wise and see it. Also the video which is currently being broadcasted is also available on list.

5.4 Watch List

We can create our own list of video category. Category which is selected by user only those videos will be available in watch list menu.

5.5 Google Map

Location of captured video can be viewed on Google map. which helps to know exact location of video from where it is captured and by using that location user can select another location.

6. Implementation

6.1 Architecture Diagram

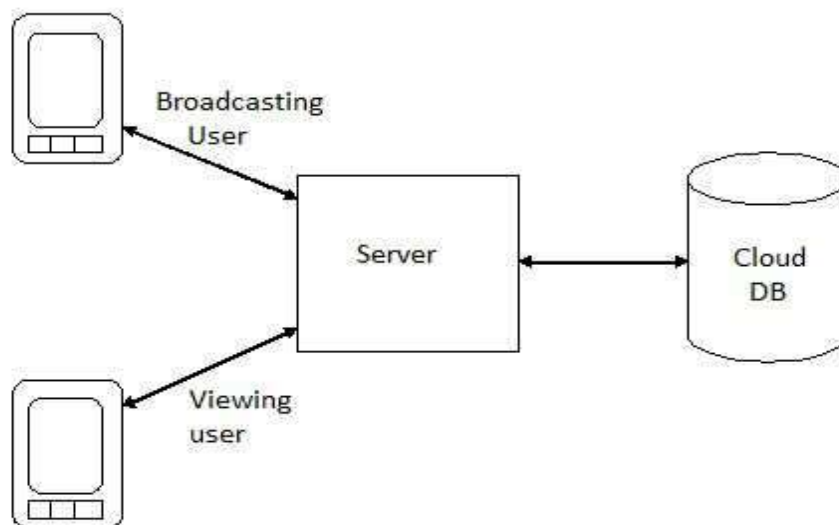


Figure 1: Architecture Diagram

6.2 Android Phone

Numbers of Android Phones are used to capture and broadcast videos as well as for viewing these captured video.

6.3 Central Server

Central server is used to store captured video and broadcast captured video. Through internet videos are stored on central server which can be located anywhere in the world.

6.4 Cloud Server

Database of our videos are stored on cloud server i.e. video name, location, latitude, longitude are stored on cloud server.

6.5 Working

In our system architecture number of users capture video using android smart phone. Captured video can store on central server using Wi-Fi network. At the same time central server broadcasts captured video to other users. User can broadcast there video by using category predefined in the system. There are seven categories defined in the system – Education, Entertainment, News etc. Video of which type that category selected for broadcast video. After the selecting category user select the sharing type. User share video with other users both registered/un-registered. He/she can create once own watch list. He/she can watch video through smart phone which is stored on central server or watch the broadcasted video by selecting the video category. Google map is provided to get location of the broadcasted video by using that location user select alternate route.

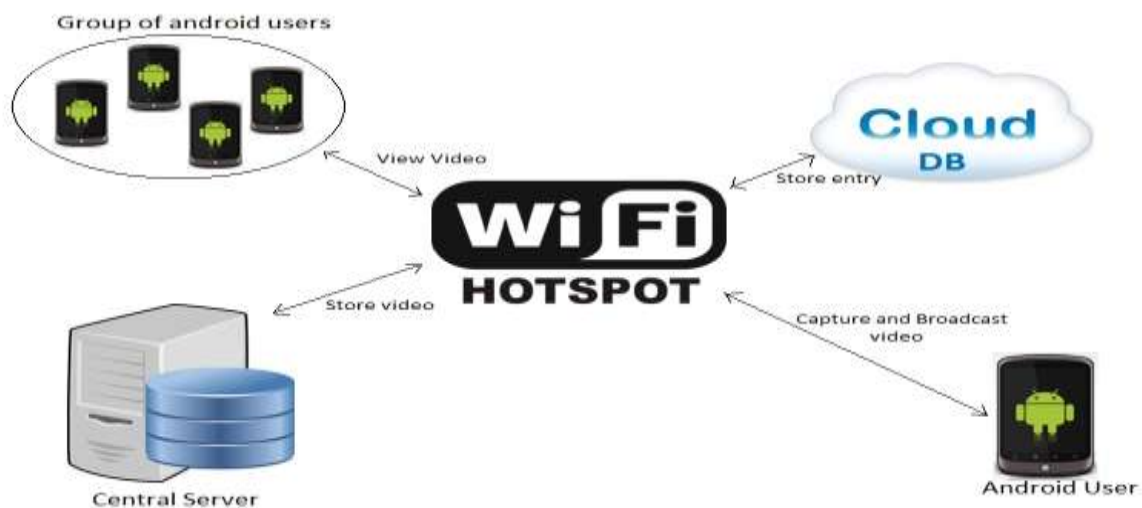


Figure 2: Working Diagram

There are two user categories in our application:

1. Registered user
2. Unregistered user

Registered user can access all options in our application such as “broadcast video”, “view video”. “Create watch list”, “View location of video on Google map”. Unregistered user can only view videos and its location of video on Google map.

We provide one time user registration for users who want to access all the features of our application.

In our application one user captures the video with “broadcast video” option in our application through his android mobile then through Wi-Fi internet hotspot it is get stored on central server at the same time the entry of that video is get stored on cloud database .

Video that is being captured is divided in 5 sec small videos after each 5 sec video it get uploaded to central server

Other application user can view that video from server. Video which currently being captured can also be seen by viewer in “view videos list”

Google map is provided to get location of the broadcasted video by using that location user select alternate route.

7 Result / Screenshots

7.1 Home Screen Selection



If the user is registered then he will get full access to our application after user registration. That is user can Broadcast the captured video, access the videos (live or stored), add user defined watch list; user can get videos related to specific defined category in My Watch list. This simple user friendly interface will appeared only on registered user.

7.2 Registration



After registration if user selects “Broadcast Video” option, then user will get above window on his Android phone. Here user must have to enter “Channel Description” which describes the video Name. After Channel Description user have to select Category of the video which he wants to broadcast. It will help viewer to understand category of video. Next option “share with”, User who is broadcasting the video has to decide access rights,

-if he chooses ‘Everyone’ then all (Registered/Nonregistered) users will able to watch broadcasted video.

-if he choose ‘Registered’ then all only Registered users will able to watch broadcasted video.

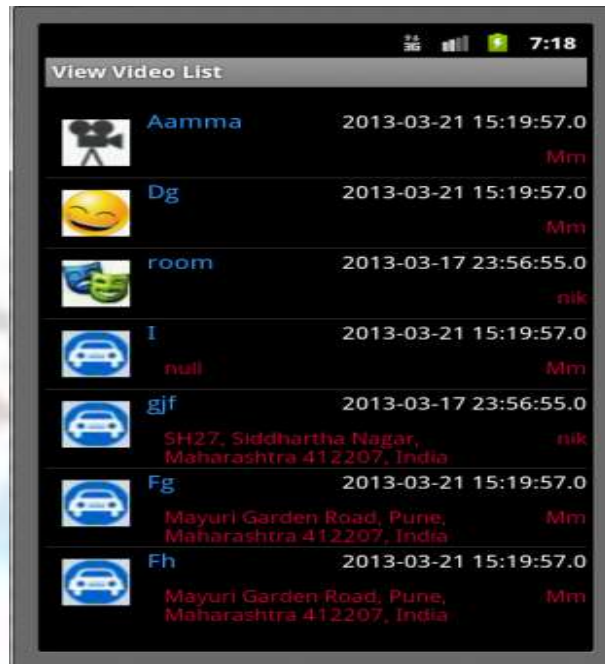
-if he choose ‘Guest’ then all Guest users will able to watch broadcasted video.

To get full access to this application, i.e. to get full application services User must have to register. This is one time registration, user have to provide Username (Which is user defined). And information of IMEI and IP Address will be fetched and stored automatically in user profile for future authentication.

If User is not registered then he will able to watch/view the captured videos but he will not broadcast the video, Create His Watch List.

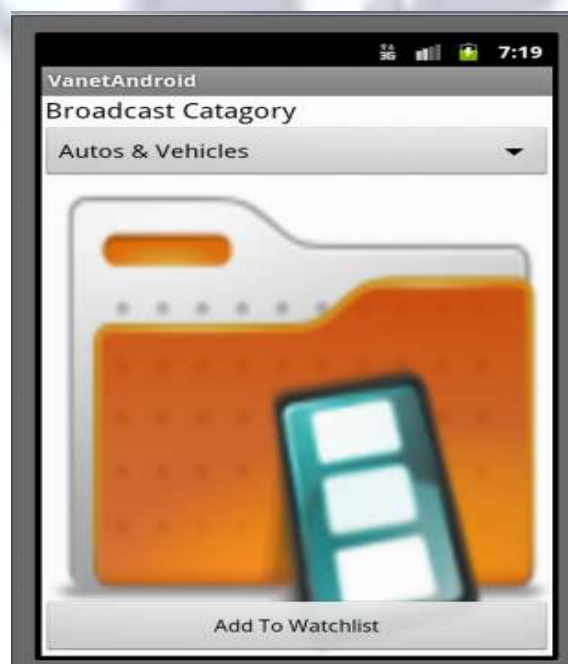
After selecting all fields user have to choose Next to start the Broadcasting Live video.

7.3 List of Videos



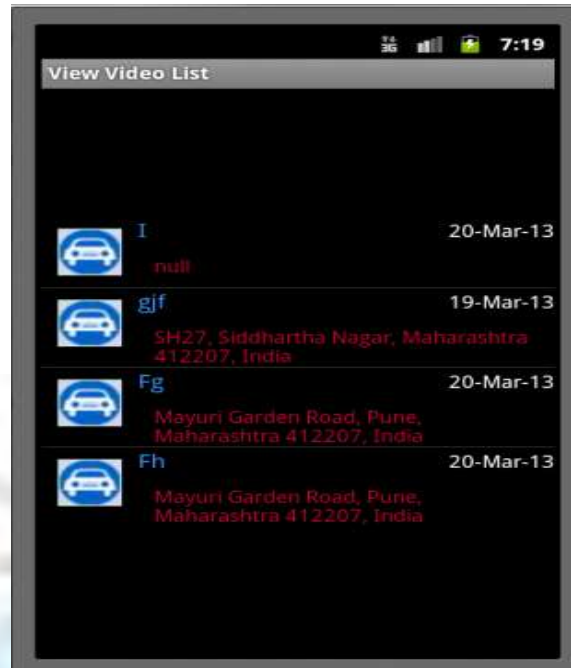
Whenever user starts broadcasting of video, video will get stored on Central Server with its Channel Description and category. Viewer can get these videos in "View Videos". In above window Names in Blue color are 'Channel Description', Small pictures describes Category of video. These videos are stored with the details of location from where it was captured.

7.4 Personal Watch List



If user wants to watch specific type of videos he can select a category and get list of videos of specific type. Viewer will get these categories in “My Watch List”.

7.5 User Selected Categories



These are User Selected Categories, which user can get in “My Watch List”.

8. Future Enhancement

At this stage this application is based on centralize server which has limitations in accessing this application, to remove this limitations this application will have to implement on Cloud Server because of cloud server drawbacks of centralize server will get recover.

This application supports only on Android operating system of mobile in future this application will supports multiple operating systems of mobile.

Streaming speed of application is slow; in future we can remove this drawback by using suitable video format.

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