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A Virtual Access Point Based Fast Handoff Scheme of IEEE 802.11

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Abstract—In the fast growing wireless technologies, IEEE 802.11 handoff is a big issue in communication. The seamless handoff problem in WLANs is a very important design issue to support the new astounding and amazing applications in WLANs, particularly for a user in a mobile vehicle. The entire delay time of a handoff is divided into probe, authentication, and reassociation delay times. Because the probe delay occupies most of the handoff delay time, efforts have mainly focused on reducing the probe delay to develop faster handoff schemes. In the proposed system we reduce the latency of handoff in wireless network by using scanning techniques, preregistration and virtualization techniques that will make the handoff faster. The main challenge in the fast handoff is to find the suitable APs, because the most of delay in seamless handoff is due to probe delay. We use the heuristic approach for finding the adjacent APs. After finding all the suitable APs the preregistration process will be started and security context will be transferred to all the selected APs. We are also providing the solution of inter ESS domain handoff problem with the help of virtual AP and buffering mechanism. In the virtual AP technique we use parallel processing of communication between different APs and MH.

Keywords—virtual, access point, buffering, handoff, probe delay, ESS domain.

I. INTRODUCTION

The 802.11 IEEE Standard has been enabled low cost and effective LAN services (WLAN). It is widely believed that WLAN will become a major portion of the fourth generation cellular system (4G). Many wireless multimedia and peer-to-peer applications, such as VoIP and mobile video conference, are developed on wireless LANs. The real-time applications suffer the handoff latency when a mobile host roaming between different wireless LANs. For the IEEE 802.11 MAC operation, the ”handoff” function which occurs when a mobile host (MH) moves its association from one access point (AP) to another is a key point to mobile users. There are many analysis results about handoff delay time and many methods proposed to reduce the handoff latency. That divided the complete handoff process into two distinct logical steps: discovery and re-authentication, and classified the entire handoff latency into three delays: probe delay, authentication delay, and re-association delay. The handoff procedure is given in the fig (a). The probe delay occupies very large proportion of the whole handoff latency; hence how to reduce the probe delay is our main object. In the IEEE 802.11 standard, the scan function is used in the discovery phase to help an MH with finding the potential APs to re-associate with, and a full scan of probing eleven channels will be implement when the MH entering the handoff process. To improve the scan operation can significantly facilitate to reduce the handoff latency. In order to decrease the handoff latency, a lot of handoff schemes in connection with different kinds of delays are proposed. Subsequently, the related research results are briefly described with regard to two parts, such as discovery phase including and probe delay and re-authentication phase including authentication delay and re-association delay.

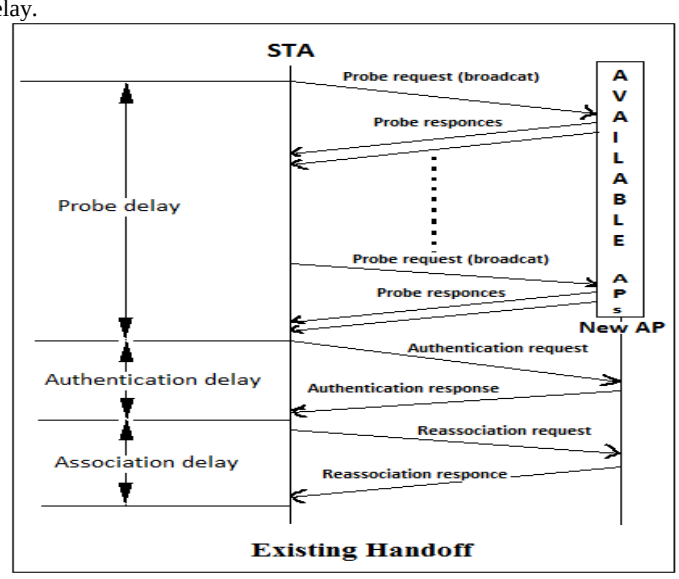

Fig (a)

The existing handoff schemes can only resolve the problems of inner ESS domain handoff, but cannot effectively resolve that of inter ESS domains handoff because the handoff between two ESS domains involves network layer operations.

In the proposed system we reduce the latency of handoff. First of all we find out the adjacent APs having good signal strength, by selective scanning technique. In the scanning technique the MH will find out the entire good signal APs among all by using received signal strength indicator (RSSI). After scanning process, the MH will start the pre-registration process in this process the MH will be registered with all the selected APs. If the MH is moving in another ESS domain then the owner of MH must to provide all the authentication details to the MH that will use during the per-registration process.

II. EXISTING SYSTEM

In the IEEE 802.11handoff there are three step processes shown in fig (a).

1. **Scanning**
   In the scanning process the Mobile Host (MH) searches for all the available active and passive AP's in the range.
2. **Authentication**
   After the scanning process MH sends the authentication messages to a particular AP and AP will send the authentication response to the MH as confirmation of the acceptance.
3. **Reassociation**

Exchanging reassociation messages to establish connection at target AP. At this point in an 802.1X BSS, the AP and Station have a connection, but are not allowed to exchange data frames, as they have not established a key.

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III. PROPOSED SYSTEM

In this paper we propose a model for IEEE 802.11 handoff. In this model we are using virtual AP, neighbours graph and also providing solution for inter ESS domain authentication during handoff. As we all know that maximum time of handoff is occupied by the probe delay. This phase of handoff is known as scanning or searching for APs in the range. We find out the adjacent APs having good signal strength, by selective scanning technique. In the scanning technique the MH will find out the entire good signal APs among all by using received signal strength indicator (RSSI). After scanning process the MH will start the pre-registration process in this process the MH will be registered with all the selected APs. Now the virtual AP will work between the MH and all the registered APs. All the authentication details will be provided to the virtual AP before the communication starts the fig (b) will better illustrate the working of propose model.

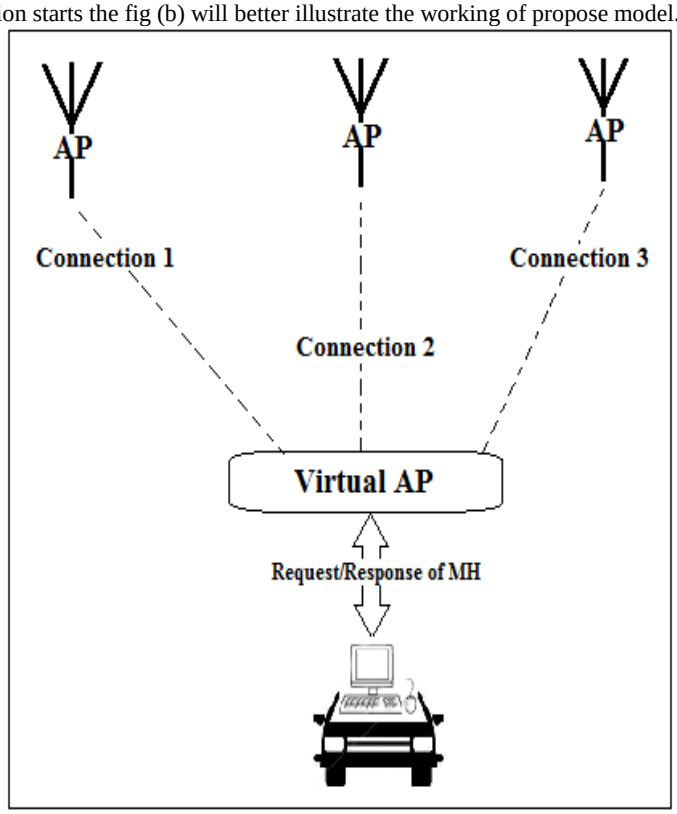

Fig (b)

After the complition of scaning process. The virtual AP will broadcast the authentication messages to all the selected APs and after get response form the APs. The virtual AP send the reassociation messages to every AP and wait for response. Once the MH want to access the network it sends the request to the virtual AP and virtual AP will send the request to all connected APs. An other problem arise when the MH moves into other ESS domain explain in fig (c).

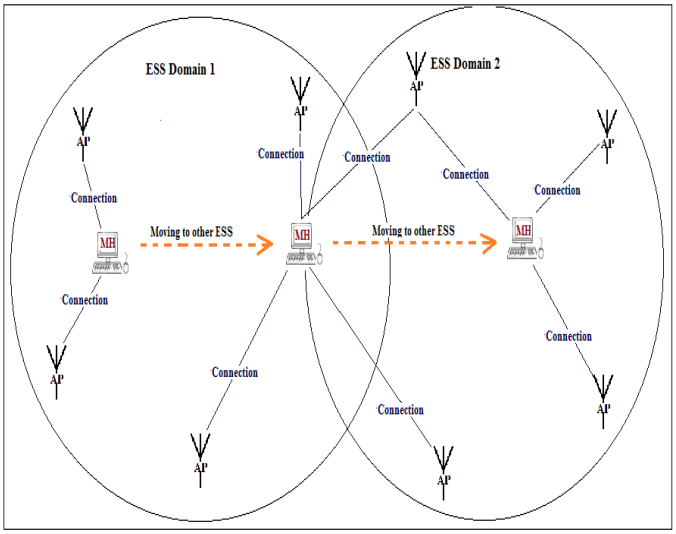

Fig (C)

IV. METHOD USED

In the fast handoff scheme of virtual Access Point we use following methods.

A. Scanning method

Here we use the selective scanning technique. In this technique the virtual AP will find out the entire good signal APs in the range of the network. We will find out good strength APs with the help of Received Signal Strength Indicator (RSSI). This is important that all AP must stay in the range for long time. So that it reduces the effort of scanning again and again.

B. Authentication

In the authentication we need all the authentication details of networks (ESS domains) where we can move. Without the proper authentication the virtual AP is not able to connect with any AP. Once we got all authentication details, the virtual AP will broadcast authentication messes to all selected APs.

C. Reassociation

Reassociation is the final step of handoff after successful reassociation. We can start communication. During the communication the virtual AP uses buffer that stores the request and response. Buffer provides data when the connection will change. Buffer will initialize automatically at the completion of request / response cycle.

V. CONCLUSIONS

In this paper, we proposed the model for fast handoff of IEEE 802.11. With the help of this model we can reduce the time of handoff. We used virtual access point in the model. It helps to communication properly without interruption.

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