

Mobile Handoff using Wireless CAN Protocol: An Approach to Reduce Call Drops

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Abstract - We all face a major issue of "Network" or Call drops while we are traveling in trains or any vehicle. This is because of a process called Hand-off, in which a call in process is transferred from one base station to another in order to avoid any call aborts. This situation is perhaps not achieved at all times. The proposed system is unique implementation of Mobile handover using CAN Protocol. This protocol adapts Bus topology which will effectively reduce the call hang drops. This implementation will cause less call drops as compared to the primitive method. This system will use cabled CAN Protocol which will give better results than wireless CAN protocol.

Keyword- CAN Protocol, CAN BUS, Mobile Handoff, Handover, base station.

1. INTRODUCTION

Call drops during handover is common problem. In simple words handover is a process of transferring an ongoing call from one area base station to another area base station. In this process the calls usually hangs up because of weak signal from base station.

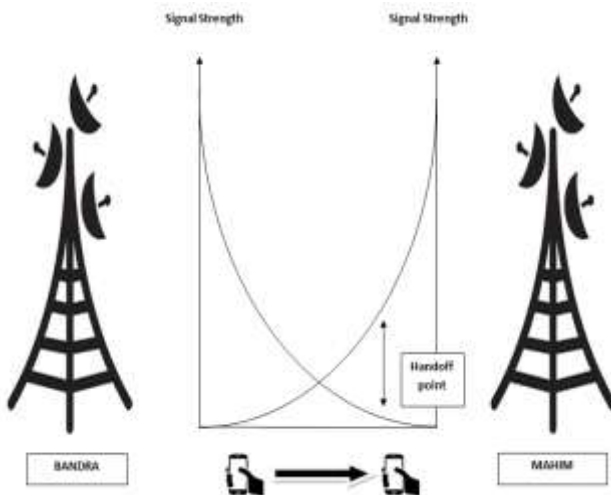


Fig: 1.1 Overall Handover

Handover is an integral element of cellular communications. Efficient handoff algorithms can improve

system capacity and service quality cost effectively. Handover occurs because the BTS are not interconnected to each other. If the BTS and mobile user are connected via Bus topology manner the handoff can be reduced effectively. A CAN protocol is a CSMA-CD/ASM protocol or carrier sense multiple access collision detection arbitration on Message priority protocol. CSMA ensures each node must wait for a given interval before sending any message.

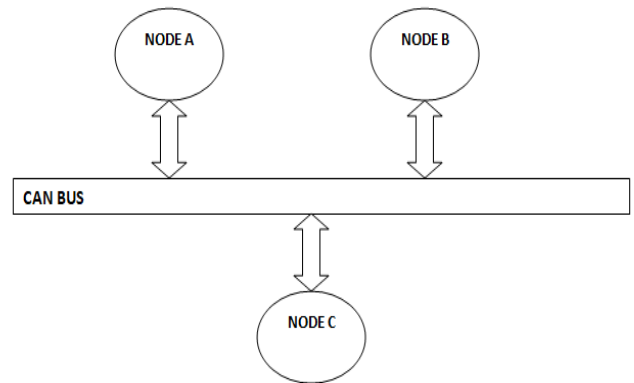


Fig: 1.2 Typical CAN Protocol.

The technical advantage of CAN Bus is that it is Multi-master capable communication. That means it could be implemented on multiple Base station and cover wide areas. It can exchange data between Can participants, Field devices and control stations. It is system-wide data consistency. In this proposed system the make and break of handover which causes call drop is eliminated for a long period of time with the help of CAN bus and CAN Protocol. Further section will discuss handoff and Methodology of the system in great details.

2. PRIMITIVE SYSTEM

For the practical realization of handoff in a cellular network each hexagonal cell is allotted with a list of potential target cells, which will be handling all the calls from the source cell to them. For creating this list there is no manual approach but requires computer tools. During a

call more than one factors of a signal in a particular channel in a source cell is monitored and assessed in order to decide when handover should take place

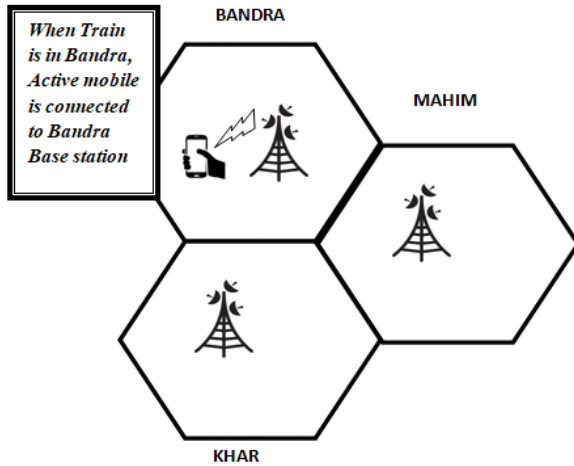


Fig: 2.1 call in progress at Bandra.

When a user is traveling in train, when he reaches Bandra and gets a call, it is served by Bandra base station. Since the train is moving and user position will get changed he will reach at a point where Bandra base station signal gets weak and it no longer can serve the user. Signal is monitored and assessed and it is decided that handover should take place to a base station whose signal is stronger than Bandra base station.

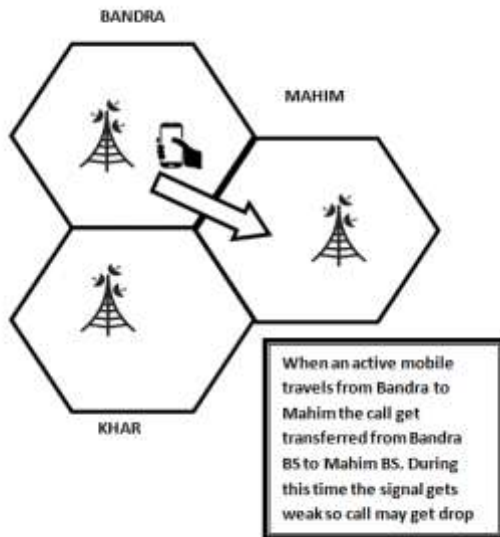


Fig: 2.2 Typical Handover situations.

If the handover is not implemented efficiently the call may get drop. This is because the frequencies cannot be reused in the adjacent cells but a new frequency has to be allocated. If handover is done properly the quality of voice may degrade but call will be continued. Also, there is problem of interference where the adjacent cell overpowers the other cells resulting in mobile/receiver desensitization.

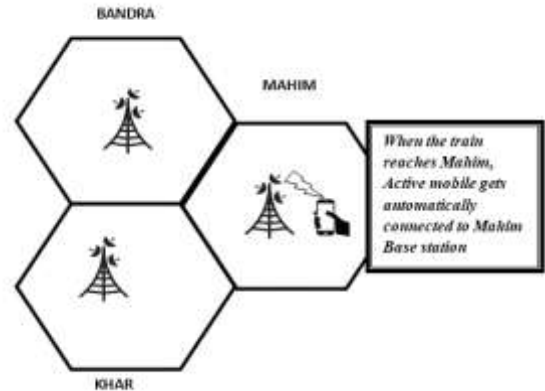


Fig: 2.3 call in progress in Mahim.

When the person reaches Mahim the call is served by corresponding base station. A handoff can be requested by the Mobile user or a BTS.

3. PROPOSED SYSTEM USING CAN PROTOCOL.

A. What is CAN Protocol?

CAN or Controller Area Network is a wireless half duplex serial network Technology. It is used in communication among different device. The device may have large radius since it is wireless CAN. It is a message priority protocol

B. Need of Control Area Network in our system.

It provides signaling rate of about 2 Mbps. In mobile communication there are many mobile phones are sending message to base station according to their position. The signal is mainly requesting call to make or take a call. Since the base stations are not connected to each other the mobile phone has to change the frequency while travelling which consist of make and break of signal which further causes call drops. If CAN hardware is embedded in base station and Mobile phones it can be implemented.

C. New Hand-off system.

The major task of CAN is it meets the real time requirement of the particular system. It is designs in such a way that the rule confined to it through which different device can exchange information. It supports multi-domain system in which the devices have same requirements.

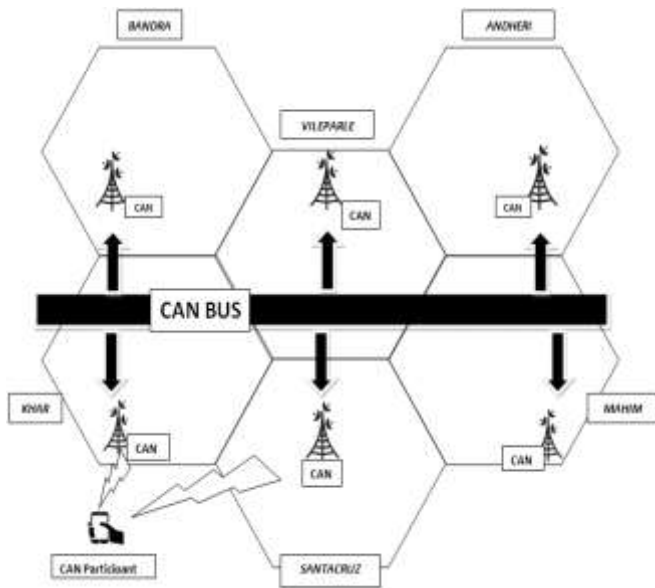


Fig: 3.1 proposed system using can protocol.

CAN protocol can be defined as set of rules used to transmit and receive data in a network. In this system the base stations will be connected in a serial bus. When a mobile with call in progress is in train moving from Khar to some other network a handoff will take place. For example, Khar base station is serving a call and the it is transferred to other base station, but here there will not be any break of signal. The mobile will only switch the base station as base station and mobile are interconnected wirelessly. Mobile just have to send the Message call will be transferred smoothly. The switching process will be quick because the base station and mobile are connected through Can and the signaling speed is better than normalh hand off speed.hand off speed. If the channel capacity is not full then call drops can be reduced to a great extent.

D. ADVANTAGE OF CAN PROTOCOL

- It is low cost so implementation will be cheap.
- Can is reliable with appropriate error detection.
- It is highly immune to EM interference
- Any node can be connected disconnected

- It is multi master that means any node can access the CAN bus
- Broadcast capability.

4. CONCLUSION

Everything is getting fast and quick but we are still stuck on old primitive handoff which results in call drops. Heavy modules of CAN protocol can be implemented which will give really switching without call drops. Modification can be made to the technology as per the requirement.

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