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A Study of Handoff to Enhance the (QoS) for Cell Communication in GSM & CDMA

[1]Amit Dixit, [2] Sujata Sharma

[1] Professor, Quantum School of Technology,
Mandawar, Roorkee -Dehradun Highway, Roorkee, UK

[2] Research Scholar, Quantum School of Technology,
Mandawar, Roorkee -Dehradun Highway, Roorkee, UK

Abstract - As we know, Handoff is an important task in maintaining the continuity of call in cellular systems and its failure can result in ongoing call termination. As mobility in wireless cellular communication systems is its backbone, so as to enhance the quality of service (QoS) & to maintain the continuous service for users to providing a ubiquitous coverage. In this paper a brief description about the different handoff techniques in cellular systems (GSM, CDMA) moreover it compares all the handoff strategies on the basis of traffic, execution time, S/I ratio, RSS (Relative Signal Strength), call handling difficulty, handoff made and generation methods. Paper also finds the brief comparison between all handoff strategies which are used in mobile wireless communication.

***Keywords* - QoS, Handoff, GSM, CDMA, Wireless Communication.**

1. Introduction

Cellular communication is a technology which mainly makes the mobile phones to communicate with each other. In Cellular communication the end user that is the mobile phone user doesn't stay at a particular place but moves from one place to another. It is the responsibility of the cellular systems to maintain efficient communication between the systems even when the user is mobile. This responsibility of cellular systems gives rise to the concept of Handoff.

Handoff refers to a process of transferring an ongoing call or data session from one channel connected to the core network to another. The channel change due to handoff may be through a time slot, frequency band, codeword, or combination of these for time-division multiple access (TDMA), frequency-division multiple access (FDMA), code-division multiple access (CDMA), or a hybrid scheme. Handoff is also called as 'Handover'.

Type of Handoff: Handoff is the mechanism which transfers an ongoing call from one cell to another cell as users are near to the coverage area of the neighbouring cell. If handoff does not occur quickly, the Quality of Service (QoS) will degrade below an acceptable level and the connection will be lost.

Handoffs are classified into two categories – *hard and soft handoffs*, which are further divided among themselves.

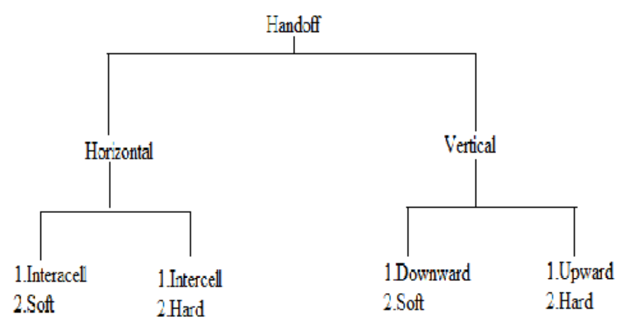

Figure 1 – Classification of Handoffs

2. Horizontal Handoff

In cellular network can be further classified into intra-cell and inter-cell handoffs. In intera-cell handoff means when a user moving with mobile terminal within a network or cell and the radio channels changes in order to minimize inter channels interference under the same base station.[34,38] Horizontal handoff or intra-system handoff is a handoff that occurs between the APs or BSs of the same network technology. In other words, a horizontal handoff occurs between the homogeneous cells of a wireless access system. For example, the changeover of signal transmission of an MT (Mobile terminal) from an IEEE 802.11g AP to a geographically neighboring IEEE 802.11g AP is a horizontal handoff process. The network automatically exchanges the coverage responsibility from one point of attachment to another. Each time a MT crosses from one cell into a neighboring cell supporting the same network technology. Horizontal handoffs are mandatory since the MT cannot continue its communication without performing it. Furthermore the intercell handoff will occur when a Mobile terminal moves into the adjacent cell of the any base station. For this reason all mobile terminals connection should be transferred to the new base station. Horizontal Handoff Phase The horizontal handoff procedure may be distinguished in the following four phases:-

(1) ***Measurement:*** During this phase link measurements (e.g. Received Signal Strength (RSS), Signal to Interference Ratio (SIR), distance measure, Bit Error Rate (BER) are carried out at both parts: the Base station and the Mobile Terminal.

(2) ***Initiation:*** The objective of this phase is to decide\ whether a handoff is needed. The handoff process should be accomplished, whenever the received signal quality deteriorates inside a cell, or between two adjacent cells, or when the MT is moving along the common boundary of two cells. Several signal strength methods for handoff initiation can be found.

(3) ***Decision***: The objective of this phase is the selection of the new channel, taking into account the actual resource availability and the network load. The decision-making process of handoff may be centralized or decentralized (i. the handoff decision may be made at the Mobile Terminal, or at the network). From the decision process point of view, one can find at least the following three different kinds of handoff decisions

1. Network Assisted handoff
2. Mobile controlled handoff
3. Prioritization handoff

3. Vertical Handoff

The switching between points of attachment or base stations, that belong to the different network technologies is called Vertical handoff and is required in heterogeneous networks. Vertical handoff or inter-system handoff is a handoff that occurs between the different points of attachment belonging to different network technologies.[33, 37] For example, the changeover of signal transmission from an IEEE 802.11g AP to the BS of an overlaid cellular network is a vertical handoff process. Thus, vertical handoffs are implemented across heterogeneous cells of wireless access systems, which differ in several aspects such as received signal strength (RSS), such as bandwidth, data rate, coverage area, and frequency of operation. The implementation of vertical handoff is more challenging as compared to horizontal handoffs because of the different characteristics of the networks involved.[33] We can say that it is the process of changing the mobile terminal active connection between different wireless technologies. Now vertical handoffs can be further classified into downward vertical handoff and upward handoff. The process of Vertical handoff can be divided into three steps, namely system as discovery, handoff decision and handoff execution. In Downward vertical handoff the mobile user channel changes to the network that has higher bandwidth and limited coverage, while in upward vertical handoff the mobile user transfers its connection to the network with lower bandwidth and wider coverage.[33,38,39]

Difference between Horizontal And Vertical Handoff

There are some important differences between horizontal and vertical handoffs that affect our strategy for implementing vertical handoffs. These are:

- Many network interfaces have an inherent diversity that arises because they operate at different frequencies. For example, the room-size overlay may use infrared frequencies. The building-size overlay network may use radio frequencies, and the wide-area data system may use yet different radio frequencies. Another way in which diversity exists is in the spread spectrum techniques of different devices. Some devices may use direct sequence spread spectrum (DSSS), while other may use frequency hopping spread spectrum (FHSS). Some of our optimizations to reduce handoff latency will take advantage of this diversity.[35]

- In a single-overlay network, a MH is ideal within a range of single base stations at a time. The MH is usually within range of multiple base stations only during a handoff. In a multiple-overlay network, a mobile device can be within a range of several base stations simultaneously for long periods of time.

- In a single-overlay network, the choice of "best" base station is usually obvious: the mobile chooses the base station with the largest signal strength, perhaps incorporating some amount of threshold and hysteresis. In a multiple-overlay network, the choice of the "best" network cannot usually be determined by factors, such as signal strength. This is because the networks have varying characteristics. For example, an in-building RF network with low signal strength may still yield better performance than a wide-area data network with high signal strength.[36]

Hard handoff: A hard handoff is essentially a "*break before make*" connection. Here the link to the prior base station is terminated before or as the user is transferred to the new cell's base station. This means that the mobile is linked to no more than one base station at a given time. A hard handoff occurs when users experience an interruption during the handover process caused by frequency shifting. A hard handoff is perceived by network engineers as event during the call. These are intended to be instantaneous inorder to minimize the disruption of the call. Hard handoff can be further divided as intra and inter-cell handoffs.

➢ **Intra and inter-cell handoffs**: In intra-cell handoff the source and target are one and the same cell and only the used channel is changed during the handoff. The purpose of intra-cell handoff is to change a channel, which may be interfered, or fading with a new clearer or less fading channel. In inter-cell handoff the source and the target are different cells (even if they are on the same cell site). The purpose of the inter-cell handoff is to maintain the call as the subscriber is moving out of the area of the source cell and entering the area of the target cell. Finally, Hard handoff is permitted between members of different softzones, but not between members of the same softzone. This is primarily used in FDMA and TDMA.

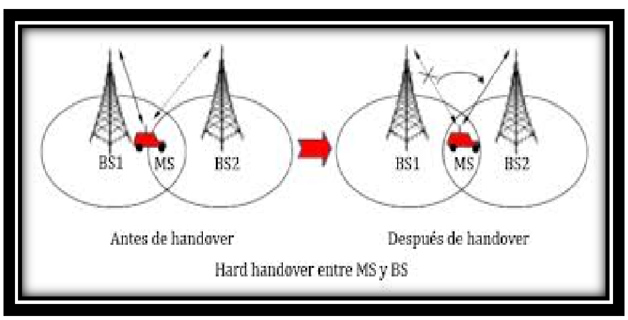

Fig 2: Hard handoff

Soft handoff: Soft handoff is also called as Mobile Directed Handoff as they are directed by the mobile telephones. Soft handoff is the ability to select between the instantaneous received signals from different base stations. Here the channel in the source cell is retained and used for a while in parallel with the channel in the target cell. In this the connection to the target is established before the connection to the source is broken, hence this is called *"make-before-break"*. The interval during which the two connections are used in parallel, may be brief or substantial because of this the soft handoff is perceived by the network engineers as state of the call. Soft handoffs can be classified as Multiways and softer handoffs.

➢ **Multiways and softer handoffs:** A soft handoff which involves using connections to more than two cells is a multiways handoff. When a call is in a state of soft handoff the signal of the best of all used channels can be utilized for the call at a given moment or all the signals can be combined to produce a clear signal, this type is called softer handoff.

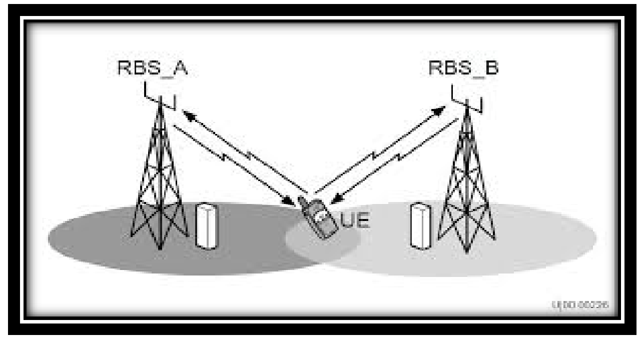

Fig 3. Soft handoff

In soft handoffs the chance that the call will be terminated abnormally are lower. Call could only fail if all the channels are interfered or fade at the same time. But this involves the use of several channels in the network to support just a single call. This reduces the number of remaining free channels and thereby reducing the capacity of the network. Soft handoff is permitted between members of a particular softzone, but not between members of different softzones.

4. Comparison of Soft & Hard handover

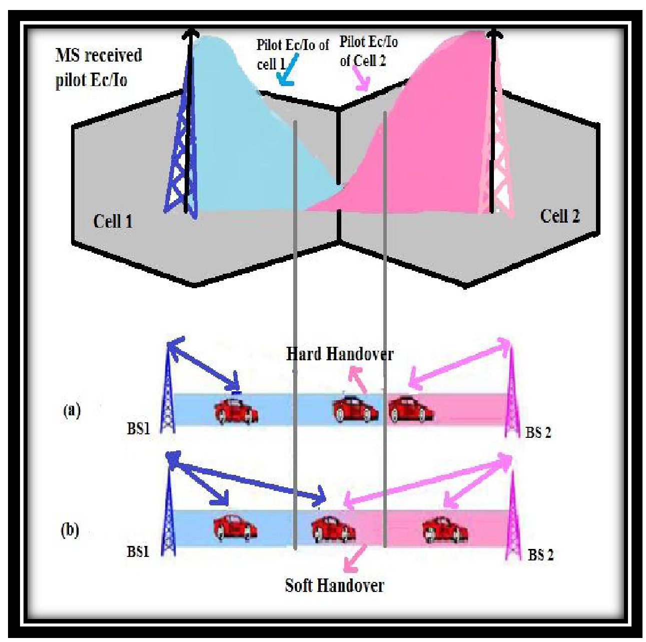

Fig 4. Comparison of soft & hard handover

Fig. Represents that mobile terminal is activated while car is moving from cell 1 to cell 2 and BS1 is the real serving base station. First curve show Ec/Io (pilot signal) of BS1 and second curve show Ec/Io (pilot signal) of second BS2.

In (a) the mobile continuously monitors the strength of the signal coming from the serving base station BS1, as the user moves across the boundary of first cell and moves into the second cell. At this time the mobile receives the pilot signal from second base station .The Ec/Io of BS2 is subtracted from Ec/Io of BS 1 and if the value is greater than hysteresis margin than hard handover is perform [32]. If we have a larger value of hysteresis it causes more delay. In (b) it has been shown that the car moves across the boundary of two cells at that moment mobile receives the pilot signal of both base station i.e. BS1 and BS2. If the pilot signal strength of BS2 is greater than BS1 pilot signal strength and the handover condition has fulfilled and soft handover is performed. The mobile continuously communicates with the BS1 and BS2 before dropping the BS1. [31] Soft handover causes less delay or no delay.

Reasons for a Handoff to be conducted

- To avoid call termination when the phone is moving away from the area covered by one cell and entering the area covered by another cell.
- When the capacity for connecting new calls of a given cell is used up.
- When there is interference in the channels due to the different phones using the same channel in different cells.
- When the user behaviors change
- Etc

Importance of Handling Handoff: Customer satisfaction is very important in cellular communication and handling handoff is directly related to customer satisfaction. Effective handling of handoff leads to improved reception and fewer dropped calls and results in customer satisfaction which is very important in Mobile communication.

Handoff is very common and most frequently occurred in cellular communication so it should be handled efficiently for desired performance of the cellular network.

Handoff is very important for managing the different resources in Cellular Systems. Handoffs should not lead to significant interruptions even though resource shortages after a handoff cannot be avoided completely.

Thus handling handoffs is very much important for a desired interruption free cellular communication.

5. Performance Evaluation of the Handoff Algorithms

The main objectives of a handoff procedure are, first, to minimize the number of link transfers and second, to minimize the handoff processing delay by correct choice of target BS/AP with speedy execution [1]. This minimizes the probability of connection interruptions and reduces the switching load. If the handoff is not fast enough, the quality of the service experiences degradations. A handoff should be evaluated as to its impact on the mobile to network connection.

The performance of handoff algorithms is quantitatively determined by the following metrics:

– *Number of handoffs* indicates the total handoff count as the mobile terminal moves between several overlapping BSs/APs. The result determines the sensitivity of the handoff algorithm. An excessively high rate indicates that the algorithm is over sensitive to metrics fluctuations, causing high rates of radio and network signaling load, and increasing the risk of disconnection. If handoffs are too few, but the mobile crosses the boundaries of coverage of a given BS/AP we will have intrusion in providing the service and possibly a connection loss.

– *Ping-pong handoffs* are handoffs during which the mobile connection is alternating between the target and initial BS/AP several times before establishing a stable link. The ping-pong handoffs over several overlapping BS/AP coverage areas unnecessarily utilize radio and network signaling resources as explained before.

– *The point where the handoff is triggered* should be as close as possible to the desired boundries of coverage of the BS/AP which is determined during the network planning and deployment phases to balance the load among all BSs/APs. If handoff takes place far away from the desired boundaries a certain BS/AP might be stressed, while another BS/AP is not equally utilizing its resources.

– *Link transfer duration* is the time period between the decision to trigger the handoff and the establishment of a reliable link with the target BS. The duration of the execution of a handoff should be as short as possible in order to minimize the transfer period during which the connection may be lost.

6. Handoff in Cellular Networks

Handoff related scientific literature started to appear in the middle of 1980s. The articles focused solely on cellular network based handoff, where transferring an ongoing call from one channel (or cell) connected to the core network to another was investigated and analyzed were the first prominent articles to analyze the handoff problem based on the concept of cellular and micro-cellular networks and channel assignment therein. They analyzed the effect of handoff on the performance of a cellular network by presenting channel assignment strategies and handoff policies.

In the analog systems of the 80s, handoff caused audible clicks or noise bursts uniquely characterizing the sound of such systems. The appearance and growth of digital cellular networks, such as GSM and D-AMPS, and the ever user mobility together with increased QoS requirements, resulted in more analytical studies of handoff decision algorithms. Preliminary analysis and evaluation with experimental simulation data of the relationship between handoff parameters, such as RSS averaging and hysteresis margin, and handoff quality measurements, such as unnecessary handoffs and handoff delay, is presented in [2] and [3]. Another research, carried out by Gudmundson [4], derives and gives analytical expressions and the bounds for performance measures of RSS based handoff algorithms where no hysteresis margin is present. Further analysis with a model for analyzing and RSS (with hysteresis) based algorithm of handoff between two cells is presented in [5]. The probability of handoff and the handoff rate is given for an algorithm that utilizes relative RSS from two BSs. The work is extended first with the utilization of absolute (threshold) RSS information in [6] and later with multi-cell systems that allow more than two BSs in the analysis [7]. Leu and Mark improved this analysis by making it more accurate with the discrete-time approach already presented in [10].

Several handoff algorithm studies have exploited these results when applying more detailed analysis of the handoff problem in cellular networks [12, 11]. The effect of mobile velocity and the handoff adaptation algorithm to velocity changes are presented in [9]. More advanced channel management policies for handoffs are presented in [8]. Link transfer issues are addressed in [13]. [14] summarizes the early research work related to handoff in cellular networks. Other handoff related topics such as soft handoffs in CDMA cellular networks, handoff prioritization schemes, handoff for voice and data integration, and the effect of traffic/mobility models are treated. These topics are outside the scope of this thesis. Positioning or distance and mobility information based or aided handoff algorithms have also attracted attention. The application of these algorithms in indoor areas requires further study, because due to sever multipath conditions, ranging and positioning in indoor areas is very inaccurate [15], [16].Due to the complexity of the handover decision process more advanced handoff algorithms have intrigued the research community. The applications of pattern recognition, in general, to handoff decision algorithms for traditional voice-oriented homogeneous cellular phone networks.

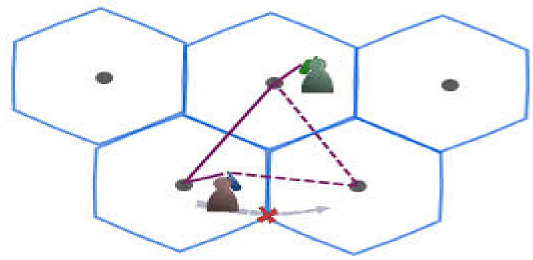

Fig 5. Handoff in Cellular network

The most popular advanced algorithms used for the handoff decision in traditional cellular phone networks have been neural network and fuzzy logic algorithms. The application of neural network algorithms to the handoff decision are treated employing traditional fuzzy and multi-valued logic algorithms and using predictive fuzzy logic algorithms is examined in [18, 17]. In the next two subsections we will give more detailed description of some of the most interesting fuzzy logic and neural network based handoff decision algorithms for cellular networks.

7. Handoff in Heterogeneous Networks

In recent years more emphasis has been put on the integration of different network technologies, thus providing a user with ubiquitous network access and at the same time hiding the technology from the user, making the communication system transparent. Handoff techniques play an important role in switching the access technology seamlessly without application disruption and maintaining the required QoS . Thus the handoff procedure for heterogeneous data-oriented networks has received considerable attention.

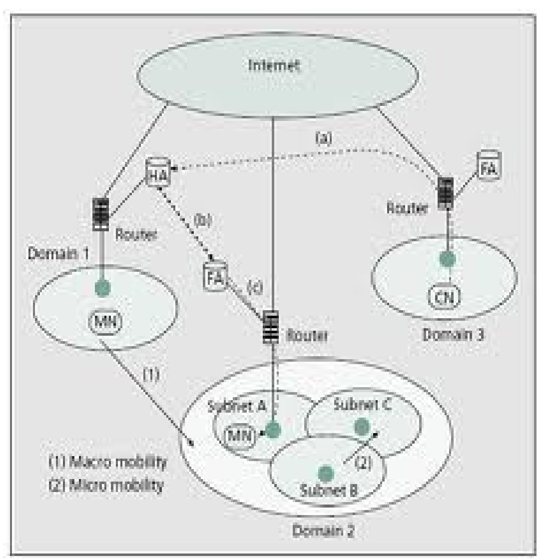

Fig 6. Handoff in Heterogeneous network

The handoff is usually performed between traditional cellular networks and WLANs that often work in an indoor environment, which makes the problem more challenging. The problem of handoff and mobility management in heterogeneous data-oriented networks . Application of fuzzy logic to the intertechnology heterogeneous handoff . The IEEE802.21 standards effort is to define a framework to support information exchange between a MT and different networks to assist mobility decisions, as well as provide a set of functionalities to execute the handoffs according to those decisions. The framework is intended to provide methods and procedures to facilitate handoff between different networking technologies by gathering information from both the MT and the involved communication networks. The heart of the framework is the Media Independent Handoff Function that provides abstracted services to higher layers by means of a unified interface. Several studies on the required handoff related protocols and signaling procedures have been reported in the literature. A good overview, with the references therein, of the system architectural aspects of the intertechnology handoff problem can be found in [22] . Experimental studies of vertical intertechnology handoffs between two different systems have been reported several publications. For example in [19] a report is given on the analysis and experimentation of handoff between GPRS and WLAN. Handoff between UMTS and WLAN is reported in [20]. Seamless connection switching between WLAN and Bluetooth is presented in [21].

8. Handoff in Rate Adaptive WLAN Networks

The modern WLAN networking techniques are based around a set or family of evolving IEEE802.11 standards. A description of the issues involving WLANs is given in the literature, [23]. The basic handoff procedure is described in the IEEE802.11 specification [24] in terms of messages exchanged between the AP and the MT during the handoff. This is called layer 2 handoff. The implementation of the algorithm and the handoff criteria are left for the equipment manufacturers. The handoff decision criteria used by existing mobility management technologies that can be applied to WLAN systems can be classified according to the measurement taken as the handoff algorithm input from the upper (OSI layer 3 or above) or lower (OSI layer 2 or below) layers. Common upper layer measurements are packet loss and round trip delay. Lower layer measurements were already described in section 2.1. Regardless of the chosen method, handoff is causing communication delay that is a cumulative sum of the times that it takes to tear down and re-establish the connection in every protocol layer described for instance with the OSI model. In order to choose a correct algorithm with the correct metrics and the right protocol to support the handoff procedure, information needs to be collected across layers.

The demands of increased QoS requirements have resulted in more challenges for 802.11. Current handoff delays in 802.11 networks average in the hundreds of milliseconds. This can lead to transmission "hiccups," loss of connectivity and degradation of connection quality especially for real-time voice or video applications.

The delay that occurs during handoff should not exceed about 50 ms, the interval that is detectable by the human ear. Fast handoffs are thus essential for instance for 802.11-based voice and video connection. The network reconnection latency during intra-subnet handoff is solved by the existing IEEE802.11F or Inter-Access Point Protocol (IAPP) [25]. The IAPP is a recommendation that describes an optional extension to IEEE 802.11 that provides wireless access-point communications among multi-vendor systems. The IAPP is designed for enforcing unique association throughout an Extended Service Set (ESS) and for the secure exchange of a station's security context between the current AP and the new AP during the handoff period.

The 802.11r working group of the IEEE is drafting a protocol that will facilitate the deployment of IP-based telephony over 802.11-enabled phones. The 802.11r standard is designed to speed handoffs between access points or cells in a wireless LAN. A problem with current 802.11 wireless equipments is that a mobile device cannot know if necessary QoS resources are available at a new access point until after a transition. Thus, it is not possible to know whether a transition will lead to satisfactory application performance. 802.11r refines the transition process of a mobile client as it moves between access points. The protocol allows a wireless client to establish a security and QoS state at a new access point before making a transition, which leads to minimal connectivity loss and application disruption.

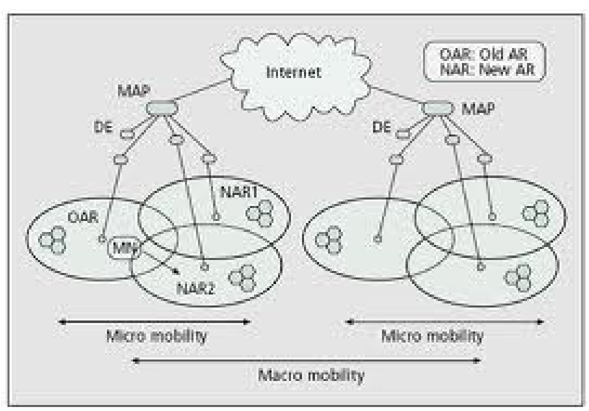

Fig 7. Handoff in Rate adaptive WLAN network

As the use of wireless networks increases, the density of access points may increase to provide more capacity, which will lead to more frequent handoffs. Another working group that is involved in developing roaming within WLAN networks is the 802.11k radio resource management group. 802.11k is intended to improve the way traffic is a within a network. In a wireless LAN, each device normally connects to the AP that provides the strongest signal. Depending on the number and geographic locations of the subscribers, this arrangement can sometimes lead to excessive demand on one AP and the underutilization of others, resulting in the degradation of overall network performance].. In a network conforming to 802.11k, if the AP having the strongest signal is loaded to its full capacity, a wireless device connects to one of the underutilized APs. Even though the signal may be weaker, the overall throughput is greater because more efficient use is made of the network resources. Pattern recognition based handoff decision algorithms have also been studied for WLAN networks. A study in [26] presented a neural network based context aware handoff algorithm that used the packet success rate as the link quality estimator and as an input metric for the algorithm. The algorithm was also implemented for a wireless LAN testbed. A handoff decision with fuzzy logic in a WLAN is presented [27].

9. Handoffs in CDMA

CDMA systems support handoffs of the mobile from one cell to another while the mobile is in the Idle state, the Access state, or the Traffic Channel state:

1. Idle— Transition from one cell to another while in the Idle state must be a hard handoff.
2. Access — Handoffs during Access are permitted only in TIA/EIA-95, but not in IS-95A.
3. Traffic— The in-traffic transition from one cell to another can be either a soft handoff or a hard handoff.

9.1 Idle Handoff

While in the Idle state, the mobile may move from one cell to another.

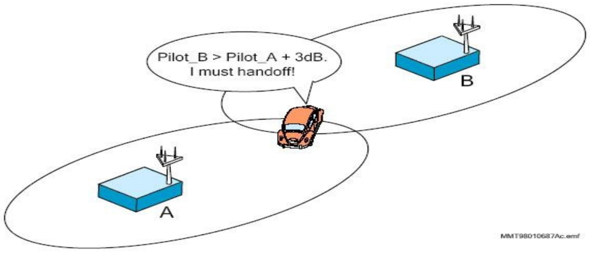

Fig 8. Idle handoff

Idle handoff arises from the transition between any two cells. Idle handoff is initiated by the mobile when it measures a Pilot signal significantly stronger (3 dB) than the current serving Pilot.

9.2 Handoff during Access

Handoff in the Access state is specifically prohibited in IS-95A. This prohibition made access processes easier to implement during the initial development of the early CDMA systems. Performance was sacrificed for simplicity.

However, Access failures in the handoff region were a significant performance deficiency, and TIA/EIA-95 includes the following handoff techniques to improve performance:

- Access entry handoff
- Access probe handoff
- Access handoff
- Channel assignment into soft handoff

9.3 Traffic Channel Handoffs

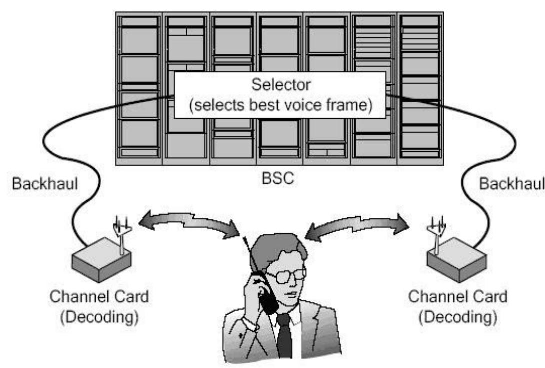

Fig 9. traffic channel handoffs

10. Handoff in GSM

In GSM which uses TDMA techniques the transmitter only transmits for one slot in eight, and similarly the receiver only receives for one slot in eight. As a result the RF section of the mobile could be idle for 6 slots out of the total eight. This is not the case because during the slots in which it is not communicating with the BTS, it scans the other radio channels looking for beacon frequencies that may be stronger or more suitable. In addition to this, when the mobile communicates with a particular BTS, one of the responses it makes is to send out a list of the radio channels of the beacon frequencies of neighbouring BTSs via the Broadcast Channel (BCCH).

The mobile scans these and reports back the quality of the link to the BTS. In this way the mobile assists in the handover decision and as a result this form of GSM handover is known as Mobile Assisted Hand Over (MAHO). The network knows the quality of the link between the mobile and the BTS as well as the strength of local BTSs as reported back by the mobile. It also knows the availability of channels in the nearby cells. As a result it has all the information it needs to be able to make a decision about whether it needs to hand the mobile over from one BTS to another.

If the network decides that it is necessary for the mobile to hand over, it assigns a new channel and time slot to the mobile. It informs the BTS and the mobile of the change. The mobile then retunes during the period it is not transmitting or receiving, i.e. in an idle period. A key element of the GSM handover is timing and synchronization. There are a number of possible scenarios that may occur dependent upon the level of synchronization.

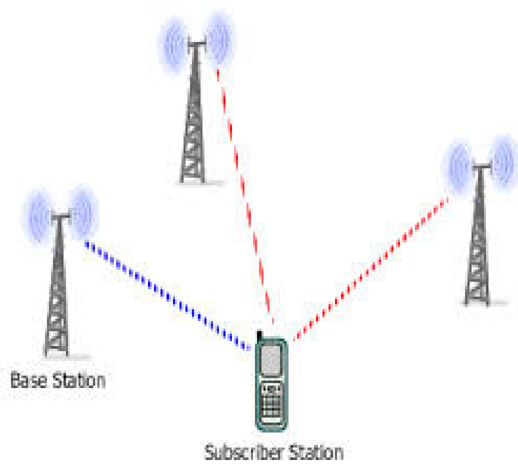

Fig 10. Hanoff in GSM

11. Simulations

Chopra *et al.* have performed simulations of soft handoff to determine the cell coverage extension due to soft handoff [28]. Their results show the difference between CDMA handoffs and GSM handoffs. They model the sampling timing of pilot strength, the timing of the active, candidate, neighbor, and remaining set updates, as well as some of the thresholds. They assume a lightly loaded system in computing $I0$, the total received power spectral density, assuming zero loading or no interference. The GSM simulation also closely follows the GSM specifications. However, the assumption is made that handoff is possible as early as half a second after the last handoff, which might not always be possible if there is too much network delay in the handoff execution. It is also assumed that the user measurements can be transferred to the serving base station without corruption (since GSM uses MAHO, this is a potential problem). Simplified simulations suggest that an additional margin of about 1 dB might be needed to account for this [28], although the threshold at which signaling breaks down is normally lower than that at which voice breaks down.

After running simulations in different conditions with varying propagation parameters, it is concluded that the difference in required fade margin for IS-95 CDMA and GSM is about 3 dB, slightly higher than whattheir rough analysis indicates (2 dB), and slightly lower than the results from the analysis of [29]. Under what circumstances will these fade margin advantages of soft handoff be useful? They can be translated to a downlink benefit, that is, smaller base station transmitter power on the downlink. It is unclear whether the downlink capacity or uplink capacity is more critical in CDMA systems. Several papers have been written on downlink power control/capacity-related issues (e.g., [30]). However, it is generally believed that the uplink is more critical. Thus it might be preferable to view fade margin gains in terms of cell coverage extensions instead of downlink gains. The cell coverage gains are generally more applicable to a noise-limited environment or lightly loaded system. They might be helpful in a rural/suburban area. In a more heavily loaded system, interference limits the system, and bigger cells may be undesirable. Instead, it may be desired to keep the cell sizes the same, or even to have smaller cells (microcells). Hence, one wishes to examine how soft handoff affects the relative interference levels

12. Conclusion

This paper has gives the details of Handoff, and Different parameter required for enhance the Quality of Service in wireless communication. As communication has become the fundamental need for the human society, for this continuously no of user in the given cell area is increasing day by day, and a problem of handoff is occurring. Without much effecting the Quality of Service in communication how one can improve the quality of handoff this paper describe in details the previous study of handoff and latest work on the same. Paper also describe thoroughly handoff strategies and have learned, that handoff is the process where changing the channels like frequency, time slot, spreading codes or combination of them, are associated with the current connection during a call. The service of wireless communication depends on the handoff strategy**.** Paper also helps us to understand that which handoff strategy is suitable for the call continually**?** it is shown that which handoff is required suitable parameter to minimize the handoff. The paper also describe the problems in handoffs so one can easily understand the concept and may be helpful for preparing the new methods for handling the call in the wireless communication.

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