Handover Decision Algorithm for Next Generation

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Abstract. Since the most recent couple of years there has been an exceptional development in the wireless communication. Presently mobile operators are engaged with deployment of 4G. Recently LTE-A or WiMAX 802.16m is used to fulfil the users requirement which is set by ITU. There are numerous generations of wireless communication from One to Fith and nowadays sixth also coming forward. In this year 4G will conclude and 5G will come up with new advance technology but it's not yet standarised. It will be deployable by 2020 and in future Such cellular communications will change our life and goes beyond our expectations.In this papaer we focus on handover dicision algorithm (HDA)for next generation.This paper presents the algorithm for better handover rate than the existing algorithm which is mostly required for next generation network. This paper also enlite the 5G architecture and its standards and Handoff in Networks.

Keywords: 5G, Handover, LTE-A

1 Introduction

In the late 1970's wireless communication is started and till the date it gives the extensive improvement in terms of communication. After this inception the wireless network developes the generations(G). The fast growth of wireless network changes the connectivity for all users and Anyone Anytime Anywhere is stays connectd with next generation netwiorks. Such networks are more user-friendly. Due to such a fast growth there will be billion devices connect at the end of 2020. But due to the limited bandwidth the service providers facing a problems. As service providers attempt to give better quality multimedia applications for next generation network [1]. The growth of wireless network shown in figure 1 with change in data rates.In figure as per the generation incrementation data rate and mobility is improve.
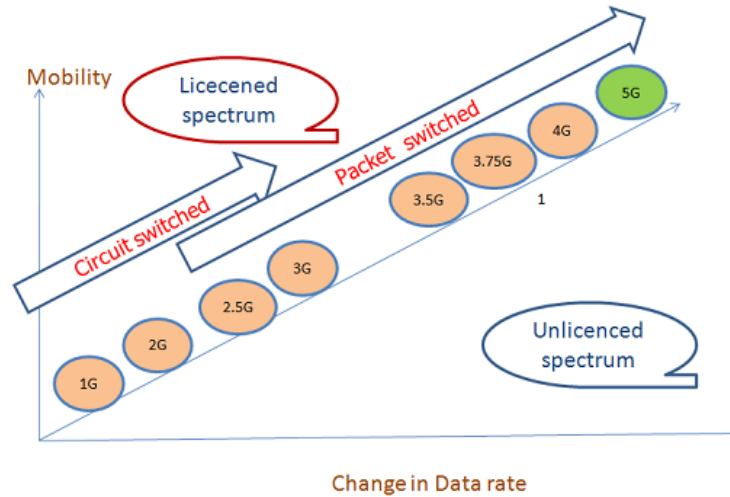

Fig. 1. Wireless technology is very much experienced till fifth generation.

1.1   Fifth Generation(5G):Why now?

3G/4G could not fulfill many of the emerging services and also could not handle the traffic pattern for next generation. Sothere is a need of 5G. In 5G data transfer rate is more than 10Gbps with spectrum range up to 500Mhz to 1000Mhz. The basic protocol for running on both 4G and 5G is IPv6[5]. 5G aims to provide unlimited access to information and the ability to share data anywhere, anytime by anyone for the benefit of the world. Following figure 2 shows General Architecture of fifth generation.

1.2   Working Concept For 5G

5G will be totally user centric i.e. very transperent for user. It will have new error prevention schemes that can be installed through internet anytime and have modulation methods and software defined radios.5G will be a collaboration of networks and individual network handle user mobility[6]. This network will be based on Open Wireless Architectures as it has Physical Access Control Layer i.e. OSI Layer. OSI layer are shown in table 1.

1.3   5G Standardization Schedule ITU-R

Nowadays 5G technology began preparing by The International Telecommunication Union Radio communication(ITU-R). The proposal is already submitted and will satisfies the requirements from 2019. Assumption for 5G is release 15 specification will enable in some contries for deployment. Software of 5G will be single unified standard of different wireless networks, including LAN technologies, LAN/WAN, WWWW- World Wide Wireless Web, unified IP and seamless
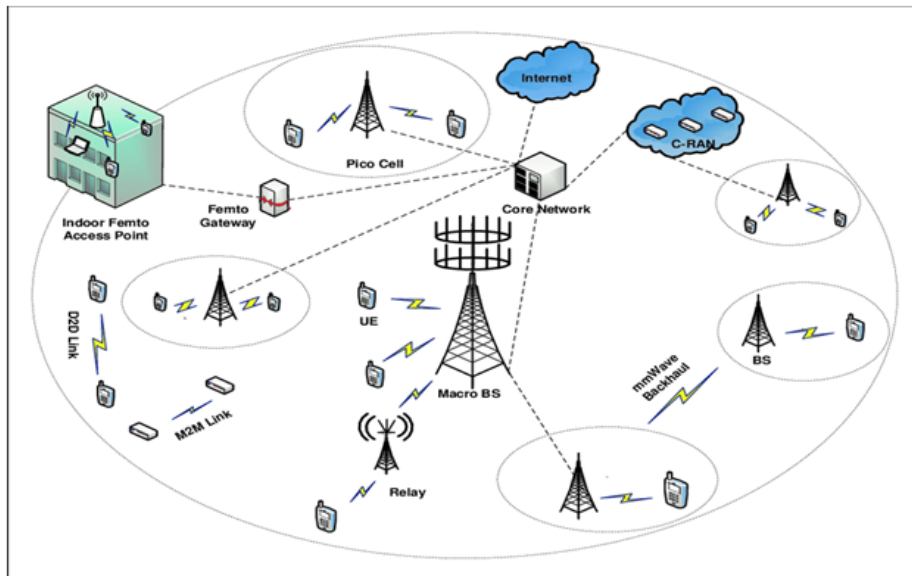
Fig. 2. General Architecture of fifth generation(5G).

Application Layer	Application(Services)		
Presentation Layer			
Session Layer	Open Transport Protocol		
Transport Layer			
Network Layer	Upper Network Layer		
	Lower Network Layer		
Data link Layer	Open Wireless Architecture		
Physical Layer			

Fig. 3. OSI Layers in 5G [4]

combination of broadband. Software defined radio (SDR)[7], Packet layer, Implementation of Packets, Encryption, Flexibility, Anti-Virus.

1.4   Risk factor in 5G

The following risks are expected from implementation of 5G for next generation. As all service providers share a common network infrastrucutre so it will very careful job to select a proper network otherwise system will unsuccessful. since 5G is a secure IP based solution it will be vulnerable to all the security threats as the current Internet world. Its very risky for internetbanking so fraud may be arises.

2   Handoff in Wireless Networks

Handoff is nothing but the call is active during change in cell. It categorised as : horizontal (intra-system) and vertical (inter-system). Horizontal handoff takes palce in same network while vertical handoff is occures in heterogeneous network. In figure 4 three phases namely Handover Measurement and Initiation,Handover
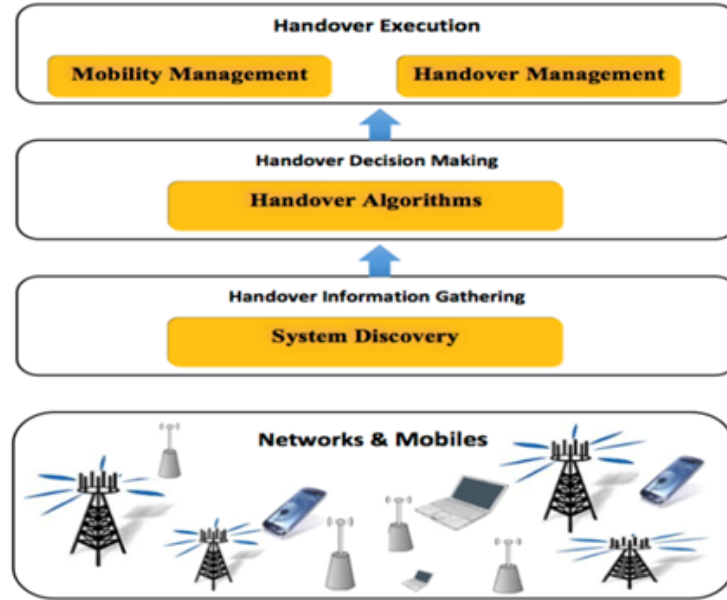

Fig. 4. Three phases in handover [8]

Decision and handover Execution.

3   Related work

There are multiple methods for horizontal and vertical handover decision algorithm. In [9] multiple cirteria based algorithms are used to reduced the power consumption. And minimization effect of connection breakdown related algorithm is implemented in [10] The RSS-based algorithm has been gained RSS threshold and by mixing the RSS threshold with the users velocity and location[11].

4   Proposed Algorithm

Next generation wireless networks must be able to coordinate services within a multiple networks. One of the most challenging problems for next generation is

how to minimise the handover during high speed. Handover process is more difficult during the selection of network. In first selection case when a user requests for a new service
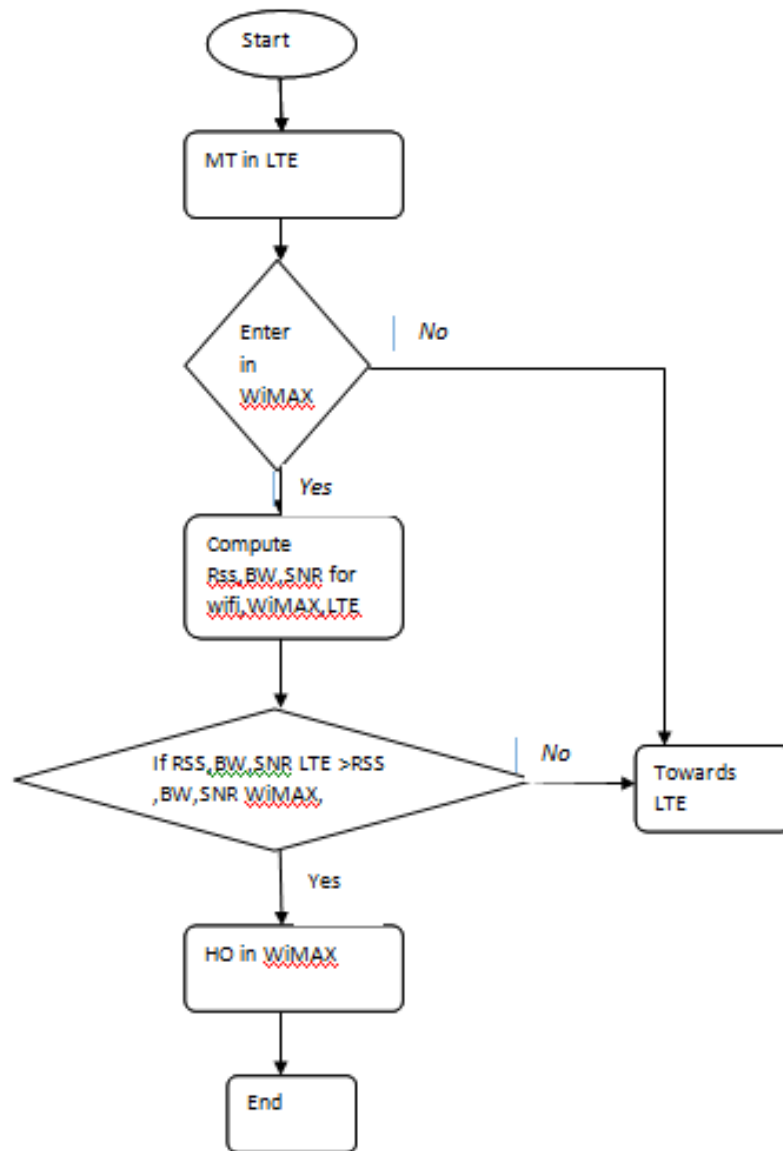

Fig. 5. Proposed handover dicision algorithm(HDA)

or when there is a handover request. Hence we proposed the handover dicision algorithm(HDA). In network selection decision process next genration network is searching a mobile terminal(MT) for nearby network. If MT heard about the advertisement then multiple services easily reached. The easiest way to selection of reachable network is to on all the interfaces.It is critical to avoid keeping the idle interface always on since keeping the interface active all the time consumes the battery power even without receiving or sending any packets.

Figure 5 shows the flowchart of proposed handover decision algorithm. Simulation results will show how the troughput and data rate is increase with this algorithm Suppose the MT towards LTE and WiMAX. First the MT is checked wheather it enters in LTE or WiMAX, if it used both networks at same time then it compares the RSS for the both (LTE and WiMAX), then it compute the RSS, bandwidth SNR and WiFi performance, If LTE gives better performance then goes for Ho in WiMAX or stays in LTE.

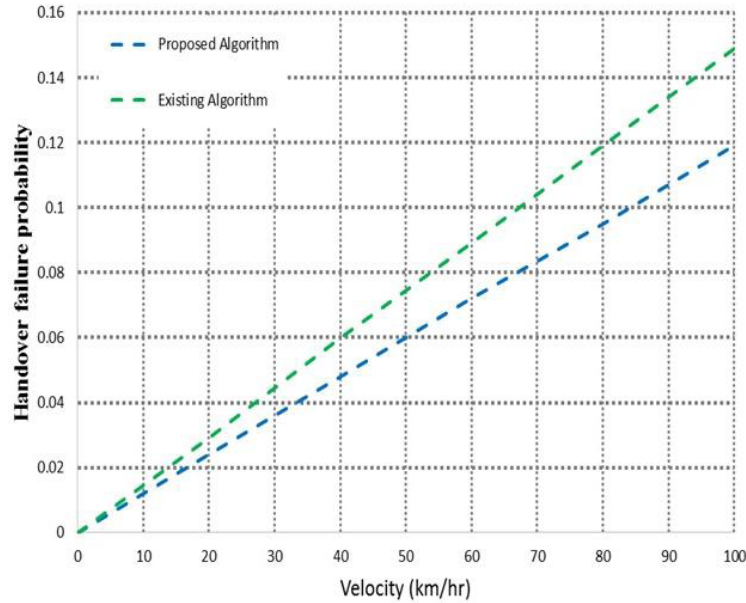## 5   Results and Simulation

Fig. 6. Existing failure handover

This paper describes the simulated handover, which is the option for a mobile station to handover between different types of networks. But the conventional handover is based on received signal strength(RSS) which is not sutable for
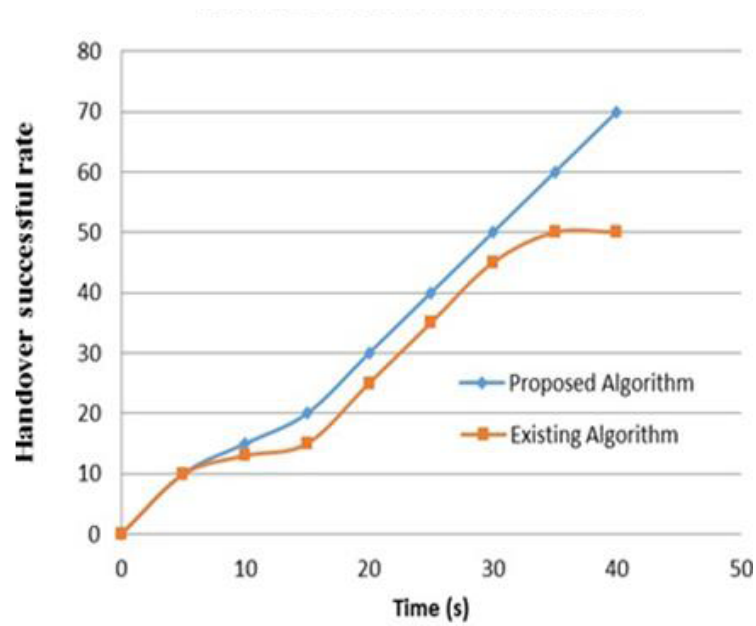
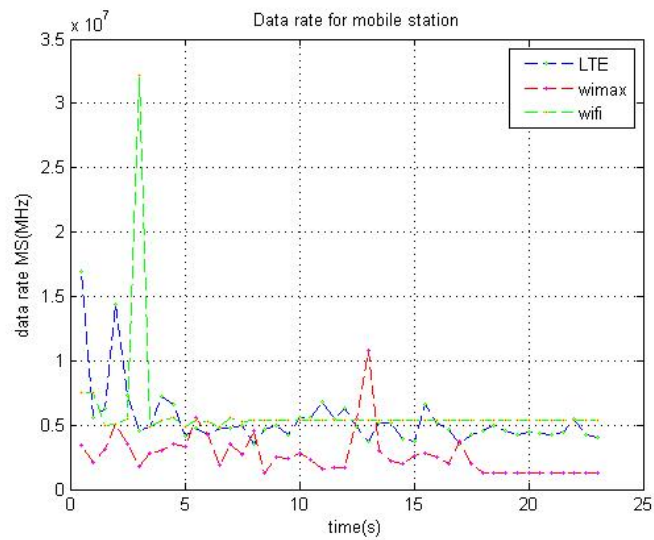**Fig. 7.** Proposed algorithm with fruitful handover rate

Fig. 8. Data rate of the Proposed algorithm

vertical handover. Various algorithms are proposed for handovers but such algorithms are not gives sucessful handover rates as well as the Quality of Service

(Qos) hence there is need of such algorothm which gives a better handoff with selection of different network. The proposed algorithm is gives a fruitful handover rate than the existing algorithm. Hence such handover should calculate signal to noise ratio, bandwidhth etc. So this paper is proposed a algorithm for implementing vertical handover for improve the data rate and throughput.

From 10 to 16 seconds this algorithm increases than conventional one. Hence with additional parameters to the RSS increase data rate with 160 percent than existing algorithm.

Simulations are obtained from MATLAB. Simulation takes palce in between two algorithms. Folloiwing results demonstrated with respect to time because wireless channel parameters randomely change with time only. Figure 5 shows the existing handover algorithm it has shown that existing algorithm having maximum handover when movement starts. Figure 5 shows that the handover rate is better in proposed method than the existing one .

6   Conclusions

Wireless network have become very leading part of our day to day life. In this paper we review to 5G technologies, need of 5G General architecture for 5G and working concept for 5G. Also focus on 5G Standardization schedule ITU-R, some risk factors are also highlighted here. In this papaer we proposed the algorithm for comparision of next generation networks with handover rates. Fifth generation technologies offers tremendous data capabilities and unrestricted call volumes and infinite data broadcast together within latest mobile operating system. world of universal, uninterrupted access to information, entertainment and communication will open new dimension to our lives and change our life style significantly.This newly 5G technology is easily available with low rates, bright future and much reliability than its previous generations.

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