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REVIEW ON: DESIGN EFFICIENT FEMTOCELL BY LAMPEL ZIV MARKOV CHAIN ALGORITHM

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Abstract: Now in India call drop is a very big problem in telecommunication industry, according to TRAI reports India needs more than 6.5 lacks mobile towers to operate mobile services very properly but in actual condition the number of mobile towers in India is no more than 4.5 lacks, so telecom services collapse very rapidly as the 3G and 4G introduced in country and percentage of call drops increases more than 23% in 2014 and also the graph of QoS is downward in last few years. The improvement of Femtocell and handover technique is the most important part in the mobile device operations, because the handover is oftentimes occurred when UE is moving, hence the handover number directly affects the performance of system, and quality of service of the network. A sophisticated HO decision algorithm can improve the performance of system. In this report, we will work on the HO decision algorithms, with the Data Compression and Aggregation technique which improve the efficiency of HO, efficiency of Femtocell based HO and also improvement in Spectral Efficiency.

Keywords: Android, GPRS, Wi-Fi, Network Monitoring

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INTRODUCTION

As the sprouting of smart phones users, the demand of data traffic on high rise. Since starting of 2000's communication industry enjoying an expeditious growth. According to recent market survey 13 % smart phone customer uses 78% all mobile traffic. With this the only 20% wireless communication usage seems to occur outdoor and 80% users to be in indoor region [1]. According to the new reports that growth in average mobile data usage on handset will settle to 30% per year in developed and developing country market like Brazil , India, Chine etc, by 2019 13% of SIM enabled devices will be 4G and these will generate 79% of mobile data traffic [2]. As the demand increases the low QoS, call blocks, slow rate of data traffic occur because of the insufficient base station and work capacity of available base station. The handover scenario totally fails because of more number of active users in a particular cell's in a cellular world and only the improvement in small cells will fade away these problem. Femto-base stations received a lot of attenuation from mobile operators, because they offload the macro network but still use the orthodox types of mobile air interface (GSM, W-CDMA, CDMA). Therefore, the end user can still use existing handsets and enjoy maximum 3G all over by utilizing HSPA at the highest bandwidth [3-4-5].
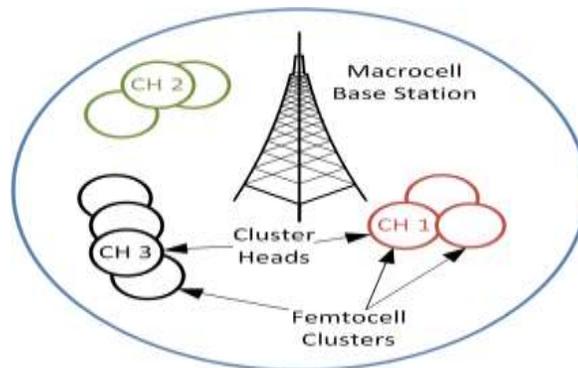

Fig: Clustered femtocell network

Keeping indoor users off the macro network is a key concern for operators, and a key differentiator for femto. Because indoors users are often behind walls with high attenuation (typically 10-20dB) [6-7]. They consume more power from the terminal and the base station, and reduces the overall macrocell capacity and coverage. Covering indoor users with femtocell base stations is two advantages, in one , not only does it provide better coverage and user experience for indoor user, but it free up macrocell resources to better serve the outdoor users. It is this double benefits that supports the femto solution [8]. According network type,

handover can be categorized in two types. Inter-network handover is occurred between different systems of network, such as handover between LTE and UMTS. Inner-network handover is triggered by inner network such as handover in same system[9.]
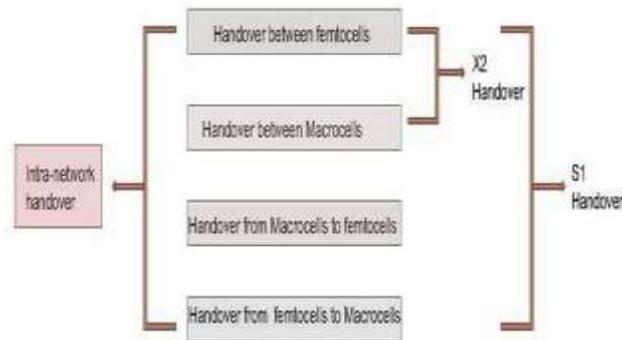

Figure: Intra-network Handover Classification

Our main focus is to improve the handover mechanism in cellular system with the data compression and aggregation technique.

REVIEW

Mohamod Ismail, Rosdiadee Nordin : discussed in paper , A femtocell basestation perform Self-Optimization function, that continually adjust the transmit power. So the femtocell coverage does not leak into an outdoor area while sufficiently covering the indoor femtocell.

Paper also explains the different power control technique.

- Fixed HeNB power setting

- Location based power control scheme.

- Power control based interference avoidance schemes.

Femtocell base station is a small low power device, but it should be able to handle the complexity of different power control techniques as focus in literature.

Guangsong Yang, Mingbo Xiao, Shuqin Zhang: author give the processes of Compressed sensing aggregation in Wireless Sensor Network and discussed the relationship between

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observations and reconstruct MSE. The transmitted data are reduced due to the sparsity of sensing signal, the communication overload of cluster head and slaves also can be reduced which can reduce the energy consumption and prolong the lifetime of the whole WSN.

Rony Kumar Saha, Poompat Saengudomlert: proposed a scheduling algorithm which employs a resource reuse strategy that reuses resource among femtocells. The proposed scheduling algorithm uses the Proportional Fair (PF) scheduling principle as its baseline scheduling strategy, but it lacks in energy efficiency.

Haganti Ramarjuna, Shaikh Asif Ahamme, Riddhi Rex: authors proposed an efficient SON handover scheme to mitigate unnecessary handovers. The proposed approach uses building information and estimated mobile user position for making handover decision. The SON is an automation technology designed to make a planning, configuration, and management of mobile N/W. SON has a plug –n-play feature which is very important in next generation communication industry. The simulation results shows that SON HO scheme achieves 31.5% improvement in reducing HO delay compared to traditional HO scheme.

METHODOLOGY

With the help of Network Simulator, mobile nodes will be created to deploy the femtocell network. To configure the communication link between mobile femtocell networks User diagram protocol (UDP) will be used. Data compression and aggregation technique will be used to improve the spectral efficiency of the cellular system after deployment of mobile femtocell network. For data compression, zipping technique will be used. It will be Lempel Ziv Markov Chain Algorithm. LZMA uses dictionary compression algorithm whose output is then encoded with a range encoder using complex model for probability prediction of each bit. The dictionary of compressor find predictions using dictionary of data structures and produces a stream of literal symbols and phrase reference which is encoded one bit at a time using range encoder.

CONCLUSION

The use of data compression and aggregation technology in cellular system improve the efficiency of handoff, enhance efficiency of femtocell based handoff and also improve the spectral efficiency.

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