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Delay Analysis of Public Group Multicast Aided Content Distribution in Cellular System

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Abstract :

The common interest of mobile users (MUs) in a social group, the dissemination of content across the social group is studied as a powerful supplement to conventional cellular communication with the goal of improving the delay performance of the content dissemination process. The Factor of Altruism (FA) terminology is introduced for quantifying the willingness of content owners to share their content. We model the dissemination process of a specific packet by a pure-birth based Markov chain and evaluate the statistical properties of both the network's dissemination delay as well as of the individual user-delay. Compared to the conventional base station (BS)-aided multicast, our scheme is capable of reducing the average dissemination delay by about 56.5%. Moreover, in contrast to the BS-aided multicast, increasing the number of MUs in the target social group is capable of reducing the average individual user delay by 44.1% relying on our scheme. Furthermore, our scheme is more suitable for disseminating a popular piece of content.

Keywords:
BS- Base Station, CTMC- Continuous Time Markov Chain, DTNs- Delay To Networks, FA- Factor Of Altruism, MANETs- Mobile Ad Networks, MSNs- Mobile Social Networks, MUS- Mobile Users

INTRODUCTION:

Similar to the BS-controlled device-to-device communication services of the LTE network, our system operates by obeying a centralized-control regime combined with a decentralized-transmission paradigm5, where the BS acts as a centralized controller in order to support the functions of synchronisation6, of social group formation as well as of coordination and resource allocation for multiple POs etc. By contrast, the information transmission is carried out by direct communications between a transmitter and receiver pair.

Content Popularity and Social Group Formation :

The interest of a MU in a specific piece of content Ci may be modelled by the probability Pr(Ci) of this MU requesting Ci from the BS. Having a higher request probability Pr(Ci) indicates that the MU is more interested in the content Ci. The statistical analysis of the realistic video viewing behaviors exhibited by YouTube users revealed that

a small fraction of popular contents attract the interest of a large fraction of users. Furthermore, the request probabilities of a set of ranked contents, say {Cili = 1, · · · ,M}, may be modelled by a Zipf distribution. Here M is the number of contents studied and the subscript i represents the particular position of Ci in the popularity list.

INDENTATIONS AND EQUATIONS:

Content Popularity and Social Group Formation

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The interest of a MU in a specific piece of content Ci may be modelled by the probability Pr(Ci) of this MU requesting Ci from the BS. Having a higher request probability Pr(Ci) indicates that the MU is more interested in the content Ci.

$$\Pr(|G_i| = N) = \frac{(N)N[\Pr(C_i)]^N\,[1 - \Pr(C_i)]^{N-N}}{1 - [1 - \Pr(C_i)]^N} \quad (1)$$

where N is the specific size of the social group Gi. As a result,the average P(Ci) of a specific delay metric associated with disseminating the content Ci across the social group Gi, whose size is an adjusted-Binomially distributed random variable .

Physical (PHY) Layer

The PHY layer, the radio propagation between any pair of transmitter and receiver is assumed to experience uncorrelated stationary Rayleigh flat-fading. Hence, the square of the fading amplitudes $|h_l(t)|^2$ during the tth time slot (TS) obeys an *exponential distribution* having a unity mean, whose tail distribution function (tdf) i $P[|h_l(t)|^2 > x] = e^{-x}$. Given an arbitrary distance $y\,l$ in meters, the PL l is expressed

$$l(y_l) = 1,\ y_l < d_0,$$
$$\frac{c!}{4\_f_c}\ ,y,l\ ,\ y_l \geq d_0, \quad (2)$$

where c is the speed of light and f_c is the carrier frequency,where as _ is the PL exponent and d_0 is the distance from the transmitter to the 'near-field' edge.

Medium-Access-Control (MAC) Layer

During a TS, a packet of the content is assumed to be successfully received by a MU, provided that the instantaneous received signal-to-noise-ratio (SNR) is higher than a predefined threshold [?]. In order to avoid collisions amongst multiple transmitters, orthogonal-frequency-division-multipleaccess (OFDMA) or code-division-multiple-access (CDMA) may be invoked for allocating each transmitter an orthogonal channel. We denote the successful packet reception probability (SPRP) of a link as $\mu_l(y_l)$. By jointly considering the PHY layer model, the SPRP is derived as

where P_{txl} is the corresponding transmit power and N_0W_l is the noise power in a communication bandwidth W_l. Given the pdf $f_{Y_l}(y_l)$ of the random distance Y_l, the average SPRP $\mu\,l$ of a link is derived.

FIGURES AND TABLES

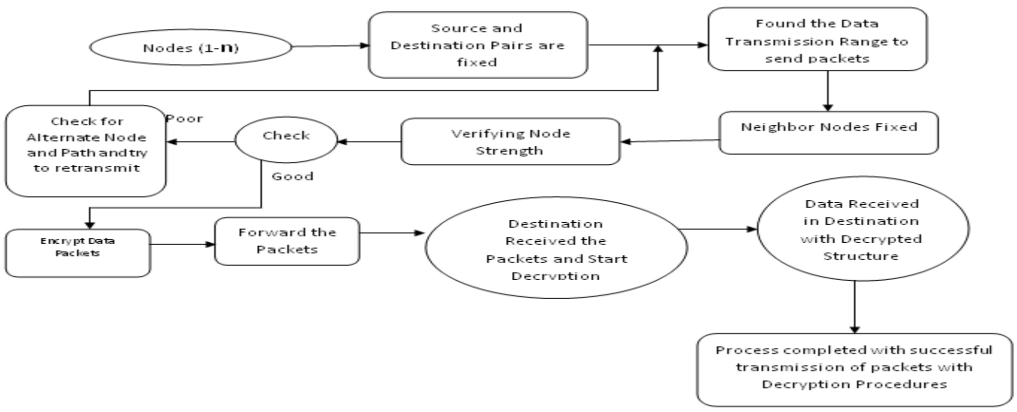

FIG 1. System Architecture Design

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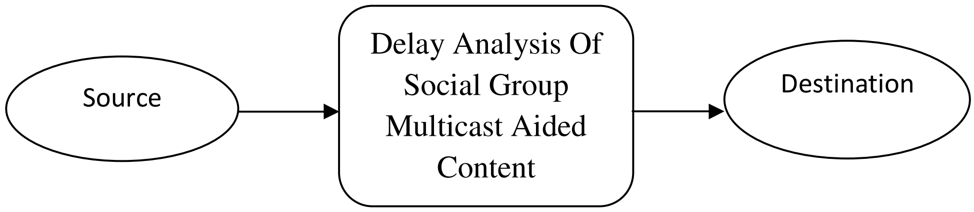
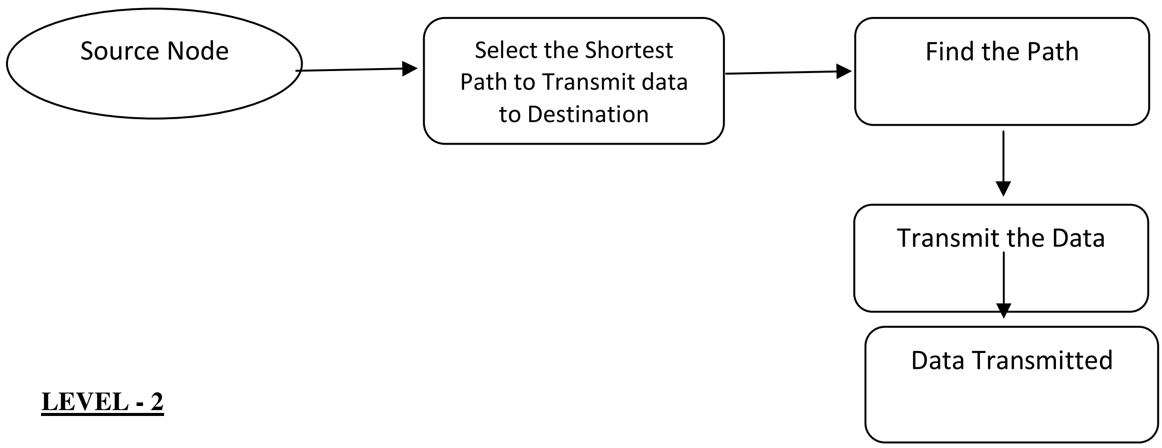
DATAFLOW DIAGRAM

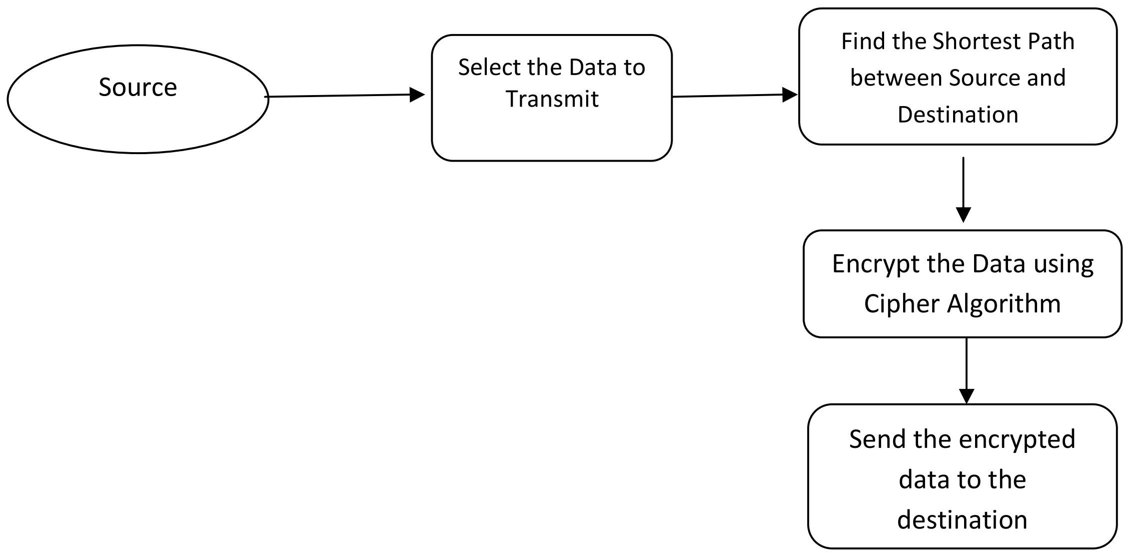
LEVEL – 0



LEVEL – 1



LEVEL - 2



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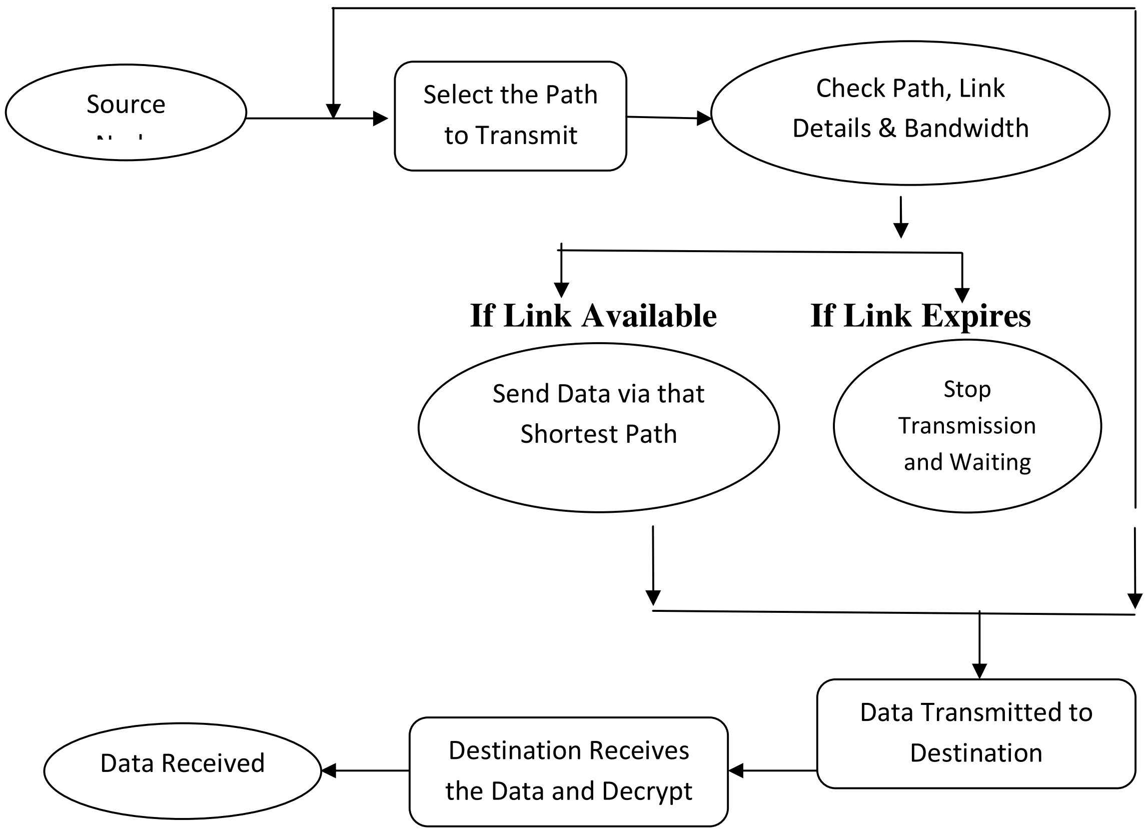
LEVEL – 3



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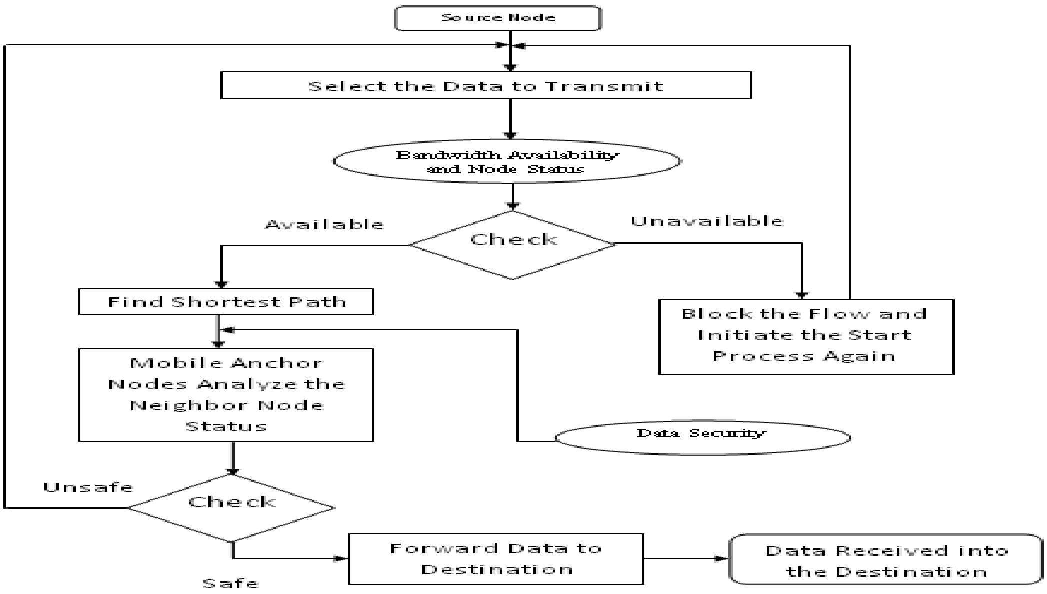

FIG 2. Flow Diagram

CONCLUSION AND FUTURE ENHANCEMENT

In this system, we proposed a social group multicast aided content dissemination scheme as a supplement to the conventional cellular system. The content popularity is modelled by a Zipf distribution and the concept of FA was introduced for the sake of quantifying the probability of a PO forwarding a packet of the content of common interest. In our scheme, the BSs are invoked for multicasting the packet at the initial stage, as well as when no POs are willing to share the packet with others. By modelling the packet dissemination process as a PBMC, closed-form expressions were derived for the statistical properties of the various delay metrics. We demonstrated that our approach outperforms the conventional BS-aided multicast in terms of both the dissemination delay and the individualuser delay, especially when the density of MUs in a target group is high. Furthermore, we found that our approach is more suitable for disseminating a more popular content. By contrast, the conventional BS-aided multicast performs better for disseminating a less popular content.

REFERENCE

1. I.F.Akyildiz and X.Wang, “A survey on wireless mesh networks”, IEEE Communications Magazine, vol.43, no. 9, Sept. 2005, pp. 23-30.
2. L.Zhao,A.Y Al-Dubai and G.Min, “A QoS Aware Multicast Algorithm for Wireless Mesh Networks”, IEEE Conference on Parallel and distributed processing, 2009, pp.1-8.
3. I.Ullah, K.Sattar, Z.U.Qamar, W. Sami, and Ali, “Transmissions Failures and Load-Balanced Routing Metric for Wireless Mesh Networks”, IEEE Conference on HONET, 2011, pp.159-163.
4. A.S.Panicker and Seetha S, “An Efficient Implementation of load balanced routing scheme for wireless Mesh Networks Using ETT-LB Metric”, International Journal of Engg Science

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and Research Technology, March 2013, pp.503-507.

5. E.Ancillotti, R. Bruno and M. Conti, "TALB: A Traffic-Aware Load Balancer for Throughput Improvement in Wireless Mesh Networks", IEEE International Conference on Mobile Ad-Hoc and Sensor Systems, 2011, pp.75-81.

6. M.K. Marina, S.R.Das, "On-demand multi path distance vector routing in ad hoc networks", Proceedings of the Ninth International Conference on Network Protocols, IEEE Computer Society, Washington, DC, USA, 2001.