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A Study on Mobile Telecom Network Traffic Using Mobility Pattern

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Abstract: *In the present the Gradient Adaptive protocol is to efficiently maintain a sequence at a particular geographic location in a light network of highly mobile nodes without using infrastructure networks. To keep information about the particular device, each mobile device passing that location will forward the information for a short while. This approach can become difficult for out-of-the-way locations around which only few nodes (device) pass by. To lecture this challenge, the mobile computing procedure that parallel to delay-tolerant communication in the mobile entry that transmit packets away from one to another position of derivation and periodically returns them to the secure location. A Single feature of this protocol is that it records the routing information while moving away from the origin and exploits the recorded moving devices to time accurately the return path. Simulations using protocol that particularly fetch the Gradient Adaptive protocol that improves packet rate compare to a baseline through path map-reading protocol. This performance gain can become even more significant when the highway map is a reduced amount of connected. To conclude, it looks at adaptive protocols that can return information inside specified time limits.*

Index Terms: *Gradient Adaptive protocol, routing information, time limit.*

I. Introduction

A telecommunications network is a collection of terminal nodes, links and any intermediate nodes which are connected to enable telecommunication between the terminals. The transmission links connect the nodes together. The nodes use circuit switching or packet switching to pass the signal through the correct links and nodes to reach the correct destination terminal. Each terminal in the network usually has a unique address so messages or connections can be routed to the correct recipients. The mobile telecom networks measured the handover rates, and calls arrival rates and also finding the call traffic in order to improve the efficiency using the gradient descent method with adaptive gain and updated the vehicles information. The existing telecom networks don't exactly trace the mobile units. Then the mobile network traces the mobile movement to improve the accuracy in the network.

The term handover or handoff refers to the process of transferring an ongoing call or data session from one channel connected to another channel. In telecommunications, it is the process of transferring mobile control responsibility from one station to another without loss or interruption of service. The mobile movements such as vehicular movements can be easily predicted in the telecommunication by using the gradient adaptive protocol. The adaptive protocol update the mobile movements and that can be accurate and easy to identify the vehicular traffic.

The global positioning system transfers the message within the certain specific range. Then the messages are transferred to the destination if the node is in reachable distance. Then the handover rate transfer the message to the nearest channel and then the message reached the destination. The adaptive protocol is used to update the information of the mobile nodes so that it is useful to identify the detailed information about the vehicle that is, the movement of the mobile nodes, handover rate, call traffic and also identify the freely available path to transfer the message to the destination. The adaptive protocol also identifies the detailed information about the geographical trajectory record and also specifies the traffic rate within the specific time limit. The trajectory record specifies the movement of the mobile nodes, the speed of the vehicle and the vehicular device number and updates the traffic of the mobile nodes while the nodes are in movement and then identifies the number of vehicle and identify the traffic rate within the specific region. The adaptive protocol identifies the mobile node distances and accurately identifies the vehicular traffic in the mobile nodes and updates the detailed information about the mobile nodes.

II. Related Work

A. Telecom handoff network system

The first work [1] that can statistically answer the statistical utilizing network that has been collected from wireless sensor network close proximity interactions which cause the spread of viruses. However, the telecom network needs extra effort and is constrained in a small area that utilizes tri-lateration to determine the

mobile user's least three concurrent downlink signals from location B after T hours from millions of mobile users. The technology is utilized to distribute the senor area. The observed time difference of arrival different cells is measured by the call holding method by specifying high-resolution data of network nodes position.

The time differences among the signal arrivals are calculated to form hyperbolic curves. The standard statistics provided by a commercial mobile telecom network are used as inputs in the prediction model. The method indicate that if the measured time slot is smaller than the expected cell residence time, and is not close to the expected call holding time, then good accuracy of the prediction model can be expected. The mobility management mechanism provides the position information of a user at the accuracy of one local area coverage that requires position accuracy within the size smaller than a cell.

The handover or handoff refers to the process of transferring an ongoing call or data from one channel connected to the core network to another channel .If a handover fails the call maybe temporarily disrupted or even terminated abnormally. Technologies which use hard hand over's, usually have procedures which can re-establish the connection to the source cell if the connection to the target cell cannot be made. The connection may not always be possible and even when possible the procedure may cause a temporary interruption to the call. Because frequencies cannot be reused in adjacent cells, when a user moves from one cell to another, new frequency must be allocated for the call. If a user moves into a cell when all available channels are in use, the user's call must be terminated. Also, there is the problem of signal interference where adjacent cells overpower each other resulting in receiver desensitization.

B. Mobility pattern

Understanding mobility patterns [2] is importance for urban planning, traffic forecasting and the spread of mobile viruses, the basic laws governing human motion remains limited to the lack of tools to monitor the time-resolved location of individuals. The trajectories show a high degree of temporal and spatial regularity to characteristic travel distance and a significant probability to return to high frequented locations. After correcting for differences in travel distances and the inherent anisotropy of each trajectory, the individual travel patterns collapse into a single spatial probability distribution, indicating that the diversity of their travel history, humans follow simple reproducible patterns.

Each time a user initiated or received a call or a text message, the location of the tower routing the communication was recorded to reconstruct the user's time-resolved trajectory. The obtained results were affected by the irregular call pattern. The data set of 206 mobile phone users was recorded for every two hours for an entire week. In both data sets, the spatial resolution was determined by the local density of the more than 104 mobile towers, registering the movement only when the user moved between areas serviced by different towers.

C. Handover Location Accuracy

The Handover Accuracy [10] for the traffic information from cellular networks has taken many different approaches to extract information from networks. The field measurements from the GSM and UMTS networks are analysed in a road traffic information context. The measurements indicate a potentially large improvement using UMTS signalling data compared to GSM regarding handover location accuracy. The handover location data can be an integral part when estimating road traffic information using passive monitoring of cellular systems. The results indicating that the technology has a large potential in GSM and they also show that the potential might be even larger using UMTS.

The communication systems will change communication patterns, and both the design of the communication system and the communication pattern of the users will affect the potential of estimating road traffic information from cellular networks. It is not clear that what to expect from these systems in terms of accuracy, availability and coverage. It is difficult to estimating travel times from limited tests based on handover signalling data.

D. Integrated Heterogeneous Networks

In integrated heterogeneous networks [4] the wireless network is to avoid modifying the existing protocols in the network nodes, the application-level approach is proposed for heterogeneous network integration. In the application-level integration, a mobility gateway is introduced to serve as an agent through which users can use different kinds of mobile devices through different kinds of networks to access Internet applications. Wireless access to Internet applications and services has attracted a lot of attention. Consequently, integrated heterogeneous wireless networks are introduced to meet diverse wireless Internet applications and services requirements. A novel WLAN link model captures the impact of both uncorrelated and correlated transmission errors, and derives mathematical expressions that describe packet loss probability and packet loss, burst length over WWAN-WLAN link.

The service area of an MG increases and less computation overhead for the content format translation is needed for users. Then analytical model need to properly adjust the MG's service area so that, it is better for system performance in the mobility gateway.

E. High resolution network

Using wireless sensor network technology, the high-resolution network [3] data of CPIs during a typical day at an American high school, permitting there construction of the social network relevant for infectious disease retransmission. Understanding the dynamics of infectious disease spread through human communities will facilitate the development of much needed mitigation strategies. The vulnerable to infectious disease spread because of the high frequency of close proximity interactions (CPIs) that most infectious disease transmission.

Analysis of targeted immunization strategies suggested that contact network data are required to design strategies that are significantly more effective than random immunization. The immunization strategies based on contact network data were most effective at high vaccination coverage.

The target nodes for control strategies, such as vaccination, due to the empirical contact data on closed networks relevant for the spread of viruses, such strategies could tested on purely theoretical networks on approximations from other empirical social networks that CPIs directly.

F. The mobility management strategy

In user mobility patterns in wireless networks [7] mobile users could only roam locally or regionally, while international roaming was possible only after the 1990s.With the increases of mobile user population and mobility, and more demands on quality of service (QoS), the current mobility management scheme faces new challenges. Mobility management plays an important role in wireless communication networks in effectively delivering services to users on the move. Many schemes have been proposed and investigated extensively to improve the performance. The Profile-based scheme (PBS) is one of them, which uses the user routine information stored in the user profile to location signalling traffic**.**

In wireless scheme, new function entity mobility agent is to signalling network for a wireless mobile network is to improve PBS performance. A new location management scheme called the mobility pattern-based scheme incorporates the time information in the user profile so that a user's current location can be determined by the movement state and the current system time which is accurate.

The extensive simulations have been carried out, and the results show that the MPBS scheme can reduce the signaling traffic load significantly and also reduce the paging delay at the same time. The signaling network for a wireless mobile network is a common-channel-signaling network, such as the Profile-based scheme which uses the user routine information stored in the user profile to reduce location update signaling traffic.

In the, the UMP is used to minimize the location update and paging traffic burden. The basic idea is to incorporate the time information in the mobility pattern profile; thus, different location update and paging schemes can be used based on the different user states. The simulation results show that the MPBS generates significantly less signaling traffic than both the IS-41 and the PBS schemes, and the paging delay in the MPBS is shorter.

In the wireless communication systems, the service providers will provide the users with user oriented services so that the network resources are allocated according to the user service requirements. In the MPBS scheme, when users follow the UMP, the location update traffic can be reduced.

III. Conclusion

The model is to predict how the mobile nodes such as vehicular movements from one location to another after a period of time. This information is very useful to investigate issues such as prediction of vehicle traffic and spread of viruses. The standard statistics provided by a commercial mobile telecom network are used as inputs of prediction model. The information can be updated every time when the vehicle is in movement and specifies the traffic and the handover rate of the vehicle within the certain region, then the good accuracy of the prediction model can be expected.

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