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File Replication for Achieving Querying Delay in Mobile Ad Hoc Networks Though Replication for Efficient File Sharing

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Abstract: Mobile computing is becoming more and more popular. The proficiency of file querying suffers from the properties of networks which include node mobility and limited communication range and resource. File sharing is one of the aspects which include peer to peer file sharing over MANET. Main advantages of P2P file sharing are files can be shared without base stations, overload on server can be avoided and it can exploit the otherwise. Wasted peer communication opportunities among mobile nodes. File replication which plays important role in enhancing file availability and reduce file querying delay. By creating replicas the probability of encountered requests can be improved. Random Way Point used for the normal MANET and Community-Based Mobility Model used for Disconnected MANETs. In RWP, nodes are moving with random speed to the randomly selected points, so the probability of meeting each node is similar for all the nodes Community-based mobility model used in some content dissemination or routing algorithms for disconnected MANETs. So both models contain idea of resource for file replication, which considers both node storage and meeting frequency.

Keywords: MANET, peer to peer network, File sharing, cooperative cache.

I. INTRODUCTION

In a mobile ad hoc network (MANET), mobile hosts can communicate directly with one another using direct pair wireless links. Because it requires no fixed infrastructure and most of the time no explicit administration a MANET can extremely useful to support communication in challenging situations, such as in rural, remote , or disaster-struck areas. P2P computing refers to technology that enables two or more peers to collaborate spontaneously in a network of equals (peers) by using appropriate information and communication systems without the necessity for central coordination. P2P networks are overlay networks typically operated on infrastructure (wired) networks, such as the Internet. However, the P2P overlay network is dynamic, where peers come and go (i.e., leave and join the group) for sharing files and data through direct exchange. Such peer-to-peer communication paradigm will be very important in wireless multi-hop networks as centralized servers might not be available or located in the Internet. Therefore, P2P will be an interesting alternative for decentralizing services or making its own local resources available in the multi-hop network to serve local user communities. P2P overlay networks in the Internet and mobile ad-hoc networks share many key characteristics such as self-organization and decentralization due to the common nature of their distributed components.

II .EXISTING SYSTEM

The efficiency of file querying suffers from the distinctive properties of mobile ad hoc networks including node mobility and limited communication range and resource. Existing ad hoc network mainly focused on global optimal replica creation with minimum average querying delay. New concept of resource for which considers both node storage and meeting frequency. File replication is an effective way to enhance file availability and reduce file querying delay. It creates replicas for a file to improve its probability of being encountered by request. Each individual node replicates files it frequently queries or a group of nodes create one replica for each file they frequently query. Unfortunately, it is impractical and inefficient to enable every node to hold the replicas of all files in the system considering limited node resource. Though redundant replicas are reduced by group cooperation, neighboring nodes may separate from each other due to node mobility, leading to large query delay.

Limitations on Existing System

- Leads to large query delay due to node mobility.
- Each individual node creates one replica it frequently queries, which cause waste of resources.
- Mobility of node affects the availability of files or message.

III.PROPOSED SYSTEM

File sharing in peer to peer mobile ad hoc network is made efficient and reduced delay with help increased cache size. In file sharing, it looks for two operations,

- Cache miss
- Cache penalty

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A cache miss refers to a failed attempt to read or write a piece of data in the cache, which results main memory access takes longer latency. Cache misses can be of three types: data read miss, instruction read miss and data write miss. Design and implementation of secured cooperative cache in wireless P2P networks are presented. Through real implementations, important design issues are identified and proposed an asymmetric approach in order to reduce the overhead of copying data between the user space and the kernel space, and also to reduce the data processing delay. The proposed algorithm well considers the caching overhead and adapts the cache node selection strategy to maximize the caching benefit on different MAC layers. Results show that the asymmetric approach outperforms the symmetric approach in traditional 802.11-based ad hoc networks due to removal of most of the processing overhead.

IV. IMPLEMENTATION

A. System Design

Architectural diagram deals with cluster of mobile nodes. In this architecture each cluster contains cluster head. Each cluster head of each cluster is communicated with centralized node. Cluster head is also elected by centralized node. Each member in the cluster is identical in some features.

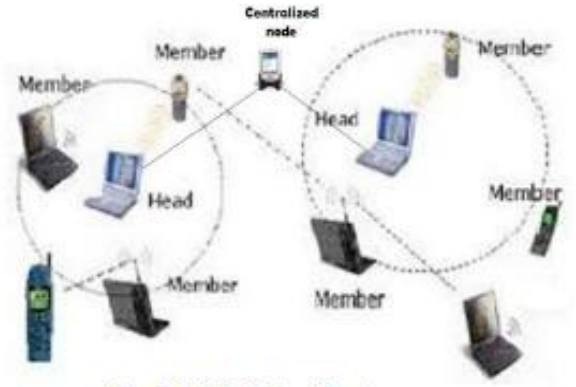

Fig 1: MANET Architecture

Each member in the cluster requests the cluster head for files and data. Cluster head includes all information about cluster members. Cluster head one group must communicate to cluster head of another cluster in order to get information of cluster member of that particular cluster.

B. Modules Description

Cache and routing module

Cell Creation:

Cells are created with default X and Y axis. Each cell has a unique Id and position of each cell is displayed with help of x,y points. All cells have a constant size which can be declared previously. Each cell have adjacent cells and particularly with maximum of six adjacent cells. Adjacency of each cell is always specified in adjacency matrix.

Node Insertion

Each cell can have multiple numbers of nodes. Node count for each cell has to be specified initially. Nodes are specified in a position with x, y points. Nodes in a network are movable since it is a mobile ad hoc network.

Gateway selection

Each cell have multiple number of nodes within that gateway node is selected. Gateway is a router or a proxy server that routes between networks. In this, gateway node acts as router between the cells. Always node which is near to the required adjacency cell is selected as a gateway node in order to reach destination with reduced time and delay.

Cache routing simulation module: Path finding:

Before finding the path between nodes. Source node and destination node are selected. With help of dynamic routing protocol DSR or AODV, efficient path can be established through gateway of each cell. Gateway could find exact direction of destination node. Use of dynamic routing protocol, whether DSR or AODV is previous selected. With that, distance, hope count, time duration can be found.

C. Caching and Routing module

Authentication:

Diffie Hellman Digital Signature scheme is used as authentication technique in peer to peer mobile ad hoc network. Digital signature is mainly used for demonstrating the authenticity of the digital message or document. Digital signature is performed by a signing algorithm and it is verified by a verification algorithm

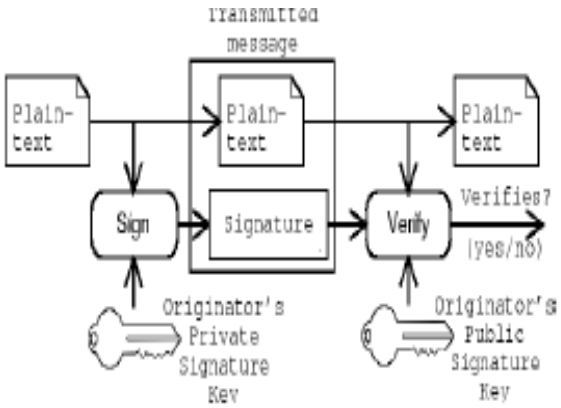

Fig 2: Digital Signature

Here authenticity is verified for checking whether respective gateway node or any other node is active. Authenticity also verifies for correct routing path, if the path does not reach the destination reports a unsuccessful result.

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V. IMPLEMANTATION

PATH		DSR			AODV		
SOURCE NODE	DESTINATION NODE	HOP COUNT	DISTANCE	TIME	HOP COUNT	DISTANCE	TIME
10	25	3	109	1.64	1	47	0.844
50	70	4	141	2.062	2	83	1.234
80	90	8	247	3.672	4	134	2.047
40	90	6	230	2.875	4	276	3.688
80	150	10	350	4.5	9	293	4.094
100	170	19	623	8.141	11	414	4.891

Fig 3: Analysis of DSR and AODV

Analysis Report of distributed routing protocol DSR and AODV represented in a tabular format. Report deals with different ranges of source and destination node values. Ranges will be of (1-50),(1-100),(1-150),(1-200). For each certain sample values are taken. Example for 1-50 range source node value is 10 and destination node value is 25 which are between range1-50. Likewise same procedure repeated for other ranges and analysis of time, distance, hop count is made. Variation in values corresponding to Time taken, Distance, and hop count is noted. According to that simple graphical representation is made with respect to distance and time

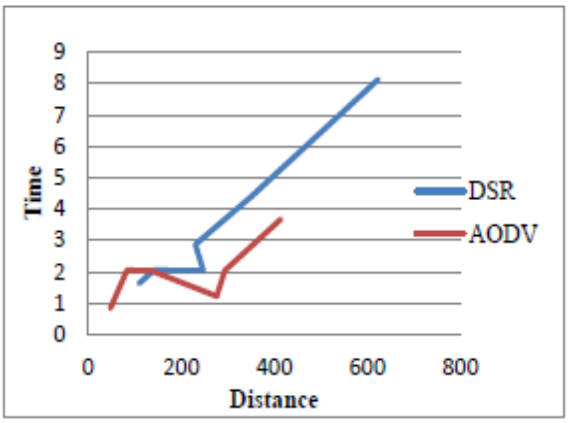

Fig 4: Distance vs Time

Graph discuss with analysis of distributed routing protocol DSR and AODV. The graph deals with the comparison of routing protocol for same source and destination values. Time taken, distance, hop count values are gradually high for DSR comparing to AODV routing protocol. Analysis Result is shown in the Graph. Analysis of distributed routing protocol DSR and AODV in p2p mobile ad hoc network is analyzed in implementation test bed Net Beans IDE 8.0.1. And final output representation is shown.

VI. CONCLUSION

Dynamic routing protocol DSR and AODV performance is enhanced in peer to peer mobile ad hoc network using gateway node and cooperative caching. Authenticated routing path is established from source to destination in peer to peer mobile ad hoc network with help of Diffie Hellman digital signature scheme.

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