

# Enhancing the Peer to Peer File Access Availability in Manet through Replication Strategy

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## ABSTRACT

In today's world Mobile ad hoc network has attracted more attention for efficient file sharing application. The efficient file availability in MANET Enhances performance of file sharing applications. However MANET suffers from Certain network issues like limited resource allocation, limited communication range, mobility of node, limited transmission range. A simple and efficient way to overcome this file access availability to make replicas and increase the file availability. However, making the replicas of all files can also cause other problems like lack of storage and memory overhead. To alleviate this problem in this paper proposed a new concept of resource allocation for file replication which significantly decreases the file querying delay and improve query performance. This methodology considers node storage capacity and meeting frequency of the node. The resource allocation rule is acquired to decrease the average querying delay. Also, another introduces a distributed file replication protocol to achieve the goal of introducing rules. The observational result demonstrates that the introduced system is capable to enhance data access availability in a mobile ad hoc network.

## Keywords

File sharing, MANET, Meeting ability, query delay.

## 1. INTRODUCTION

The effective way to enhance the file availability is file replication and which also reduce the file queueing delay. It creates replicas for a file to improve the its performance of file availability and also improve the probability of being encountered by request. It is inefficient to enable every node to hold the replicas of all files in the system when we consider the limited node resource. File requesting cunctation is consistently main in a data sharing system. People regularly craving to get their asked file rapidly regardless of whether the data are well known or not. But the main concern is how to assign the finite resource in the system to various documents for replication so that the comprehensive file requesting cunctation is decreased? Currently, more than one replication protocols got introduced for ad hoc network. Every independent system replicates data it repeatedly requesting and then a cluster of systems generate the one copy for every they meet constantly.

In recent data replication protocol deficiency of regulations and principles to assign finite resources to file for generation of copy for the sake of reach of the goal that is, decrease average requesting consultation. In this approach basically consider the memory capacity as the resource for the copy, yet disregard that a system periodically meet different systems additionally impacts the accessibility of data. The data on the system with greater meeting capacity have greater accessibility.

Here present another idea or approach of asset for file replication, which consider both system stockpiling and system meeting capacity. Also examine the impact of asset allotment

on the normal requesting cunctation and determine an optimal file replication rule (OFRR) that designates assets to every file depend on its prominence and size. In addition here introduces a data replication protocol depends on the regulation which approximates the minimal global requesting cunctation in a completely dispersed way. Our examination and results display the working of the introduced protocol in corresponding with another replication protocol.

## What is MANET?

The word MANET stands for mobile ad hoc network and also famous as wireless ad hoc network which is a kind of decentralized wireless structure and can shift the place and set up automatically on the fly in another word MANET is a local area network that created impromptly as system linked. Rather than depending on a base station to organize the stream of packets to every device in the system, the independent system device forward the messages to and from one another. And in Latin ad hoc means is for this particular objective. Every node in the ad hoc network is allowed to move autonomously towards any path, and will thusly change its connections to different nodes periodically. Since, MANETs are movable, they utilize the wireless network to interface with the different systems.

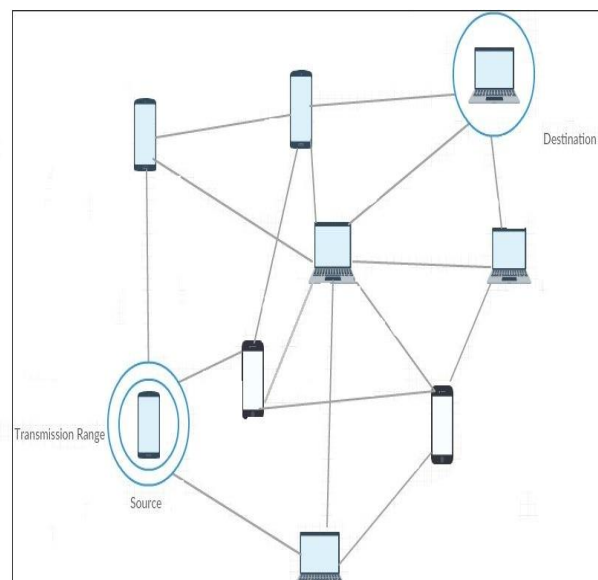


Fig.1: MANET Structure

## Types of MANET

Various kinds of MANETS are containing  
In VANETs – a brilliant vehicular ad hoc system is using artificial intelligence to deal the accidental circumstances like automobile crash and mishaps. VANET authorized powerful correspondence with another vehicle and support for transferring the data between them with roadside supplies. Internet based

mobile ad hoc network (IMANET) – supports for connect fixed and mobile device.

### **Types of routing protocols in the MANET**

Two types of routing protocols:

1. Table-Driven Routing Protocols
  - Destination-Sequenced Distance-Vector Routing (DSDV)
  - Cluster head Gateway Switch Routing (CGSR)
  - The Wireless Routing Protocol (WRP)
2. Source-Initiated On-Demand Routing Protocols
  - Ad-Hoc On-Demand Distance Vector Routing (AODV)
  - Dynamic Source Routing (DSR)
  - Temporally-Ordered Routing Algorithm (TORA)

Advantages of MANET:

- This network can be created there where is lowest communication infrastructure.
- This network is required, very low estimate.
- This network can be configured at any area and at any moment.
- This is router free, it doesn't require any base station or any wireless router

## **2. LITERATURE SURVEY**

This division supplies an analysis of literature on the data availability and distribution of data. The study in file sharing in ad hoc network, is comparatively new in ad hoc network. By enhancing the data sharing in ad hoc network could be provides people to get more advantage.

Data replication method has been explored in[5],[4] and [3]. As per these methods a general protocol is explained as follows.

An individual system and cluster of systems consider data requesting recurrence and decide system replication choices. Three data replication techniques were introduced in[ 3]. They are famous as Dynamic Connectivity Based Grouping (DCG), Dynamic Access Frequency and Neighborhood (DAFN) and Static Access Frequency (SAF). As for SAF every device in ad hoc network decides the replication of data that are requested much of time or periodically depends on the accessible memory. This procedure may produce the one or more copies in the closest node depending on their priority. This may be issue memory overhead problem.

In ADFN, the matching in the copies is averted in the nearest area. DCG is draconian on discarding copies which are duplicated . It additionally decreases the copies in the replica between the set of devices gather together and keep up copies depends on the recurrence of request made to data. The DCG and DAFN discards gratuitous copies from the nearest system. But here they had got problems with device movability. They additionally cause a more bottleneck while distinguishing duplicate of the copies and arranging the cluster of devices.

Zheng et al.[4 ], introduce various approaches. As per this every device includes in the accumulation of information available statistics from nearest node and after that take decision as a relinquishment or formation of copies.

Duong and Demeure [ 5 ], clustered devices together depending on constant links. At that point every system is permitted to inspect the probability of neighbors to query a data and condition of the capacity while taking replication choices.

Later in Yin and Cao [ 2 ], utilized the caching idea in terms of cache data which are known as famous they utilize data fetching ways and recognize crossed systems for data replication. This is a powerful strategy for famous data. It brings about wastage of storage space on systems. The recovery execution is examined by the analyst in addition, investigating guarantees coding for better execution. Chen [ 6] concentrated on discovering a method which empowers to utilize an insignificant number of servers in place to guarantee that there will be maximum data accessibility. Moussai et al [7], examined and introduce a replication process which has two stages in it. The initial step deals with the essential replication and the second step is dealing with the dynamic replication. Hence, data copies are used to spread the necessary substance in the system to fulfill end client and assure the information misfortune is averted with regards to network division

Athor C. Palazzo and A. Bujari [8], describe the delay and division tolerant solution for node to node data sharing. Because of movability, the connections interface amongs movable device are transient and system conservation overload is a biggest execution bottleneck for information transmission. Low device quantity makes it hard to configure end to end association, hence interrupt a constant end to end way among sender and receiver. This makes the advanced sort of DTN, which was initially expected for transmission in space, however currently straightforwardly available from our pocket. This paper represent a extraordinary purpose system for finding, looking and exchanging data customized both the quality of MANET and the necessities of peer to peer file sharing.

This approach is depending on the an application layer overlay structure. Here port a DTN kind solution into a framework less condition like MANET and use peer movability to achieve information in other detached systems this is finished by establishing the nonconcurrent communication model, store-delegate and forward. To enhance information exchanging execution while decreasing corresponding overhead, they select these uncommon peers by the desire of experiencing them again in future and allow them various download beginning stage on the file.

Author A. Lindgrn, A Doria and O. Schelen[11], the solution of Probabilistic Routing in Intermittently Connected Networks. Here they deal with the issue of routing in sporadically connected systems. In such systems there is no assurance that there will be a completely connected route amongst sender and receiver exist whenever, rendering conventional routing methods not able to transfer packet between systems. Here introduce the probabilistic routing method for such systems.

Authors, Y. Tseng, S. Ni, and E. Shih[9], discussed adaptive approaches to relieving broadcast storms in a wireless multihop mobile ad hoc network. In a multihop MANET, broadcasting is an operation to help numerous applications. Already, it was demonstrated that gullible broadcasting by flooding may cause genuine repetition, conflict and crash in the system, which we mention as a broadcast storm issue. Some threshold based scheme are appeared to perform superior to flooding in that work. This paper represents the few adjusting scheme which can dynamically adjust the threshold depending on the local connectivity data . simulation displays these adaptive schemes can give better approachability and additionally effectiveness when contrasted with the past outcomes.

### 3. EXISTING SYSTEM

Data replication is a compelling approach to upgrade file accessibility and decrease data requesting cunctation. It makes copies for a file to enhanced its possibility of come acrossed by demand. Lamentably, it is unfeasible and ineffective to empower each device to hold the copies of all files in the network considering restricted device resource. Additionally file requesting cunctation is the main concern in a file sharing framework. The client frequently ambitious to get their querying, file as quickly as possible, whether the file is well known or not.

In the last mentioned , however repetitive copies are decrease depending on cluster cooperation, the neighboring device might isolate from one another because device movability, cause of greater requesting cunctation. There are likewise a few works tending to content storing in disconnected MANETs/DTNs for effective information fetching and packet routing. They essentially cache information that is much of times requested on places that are gone to as often as possible by movable devices. Both the two classes of replication techniques fail to completely consider that a device movability influences the accessibility of its file.

#### Disadvantage:

The broadcasting can rapidly find the data,however it prompts the communication storm issue with high power utilization.

Probabilistic routing and data finding methods prevent broadcasting by sending a request to the system with greater possibility of meeting the goal.

### 4. PROPOSED METHODOLOGY

The introduced strategy is depicted here. Random waypoint(RWP) model is utilized for optimum data replication. The Community based mobility module is utilized to deal with movability in ad hoc network concerning with the data accessibility data replication issues. Meeting capacity dissemination is considered for data replication choice. The structure of file replication rules accomplished the data sharing abilities to the devices in the application.

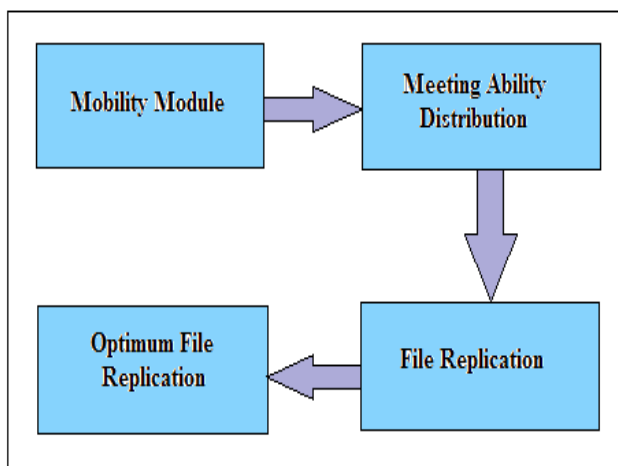


Fig -2: Overview of methodology

#### Modules

- Optimal file replication with RWP model
- Community based mobility module
- Meeting ability distribution

- Structure of the file replication protocol:

#### 4.1 Optimal File Replication with the RWP Model

In the RWP module, we can take for granted that the inter meeting time between devices takes exponential dissemination. At that point the possibility of meeting a systems is no depended with the preceding come across systems. Here we characterized the meeting capacity of a device as the normal number of devices it meets in a unit period and utilize it to analyze the optimum data replication. In particular, if the device can meet more devices, it has greater possibility of being come acrossed by different devices later on.

The system possibility of come across by different systems corresponding to the meeting capacity of the device. This shows that data living in devices with greater meeting capacity have greater accessibility than records in devices with having less meeting capacity. So we consider both meeting capacity and capacity in measuring a device asset. At the point when replica is made on the device, it infests the memory on the system. Additionally, its possibility of being met by others is chosen by the systems meeting capacity. This implies that the copy actually expends both the capacity assets and the meeting capacity assets of the system.

#### 4.2 Community-Based Mobility Model:-

In this model we lead the examination under the community-based mobility model. We consider every devices delightful capacity. It is characterized as a device capacity to fulfill requests in the organization and is measure depending on the device capacity to fulfill requests in every group. In this module ,since devised interests are steady amid a specific period . We consider that every system, data requesting the pattern stays stable in the considered timeframe. At that point the quantity of devices in a group represents the quantity of requests for a given file produced in this community. Subsequently a data holder has less capacity to fulfill requests from small communities.

Thus, we incorporate every community's division of the device into the measurement of the wonderful capacity.

#### 4.3 Meeting Ability Distribution:-

We gauged the meeting capacity dispersion from the real trace to affirm the need to consider device meeting capacity as a vital factor in the resource allotment in our structure.

For every trace, we gauged the meeting capacities of all devices and rated them in descending order. We see that in all traces, device meeting capacity is disseminated in a wide range. This is similar to our past claim that devices typically have the distinctive meeting capacities. Likewise, it confirms the need of considering device meeting ability as a resource in data replication since if all devices have the comparative meeting ability, copies on various devices have comparative possibility to meet requesters, and subsequently there is no requirement to consider meeting capacity in resource allotment.

#### 4.4 Structure of the file replication protocol

We introduce the priority competition and split data replication method. We initially present how a device fetches the parameters required in PCS and after that gives the detail of PCS.

In priority competition and split, every device in the network is progressively refurbishes its meeting capacity and the normal meeting capability of all devices in the network. Such a data is traded between nearest device.

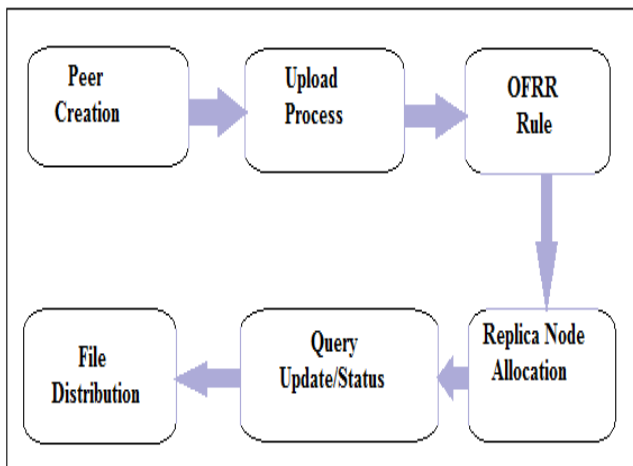
We present the procedure of the replication of the data in PCS. Depending on OFRR, since a file with the greater P should get high resource, a device should allot the greater priority to its files with greater P to contend resource with different systems. Therefore, every system arranges all parts of files in decreasing order of their Ps and makes replicas for the files in a top down way intermittently.

The data replication stops when the connection session of the two included devices closed. At that point, every device proceeds with the replication procedure for its files after barring the separated device from the nearest device lists. Since file prominence, Ps, and accessible network resources change over a long time. Every device intermittently executes PCS to powerfully deal with these time varying components. Every device is occasionally figure outs the prevalence of its files to reflect the changes on the data fame in various eras.

The periodical data fame refresh can consequently deal with file dynamism.

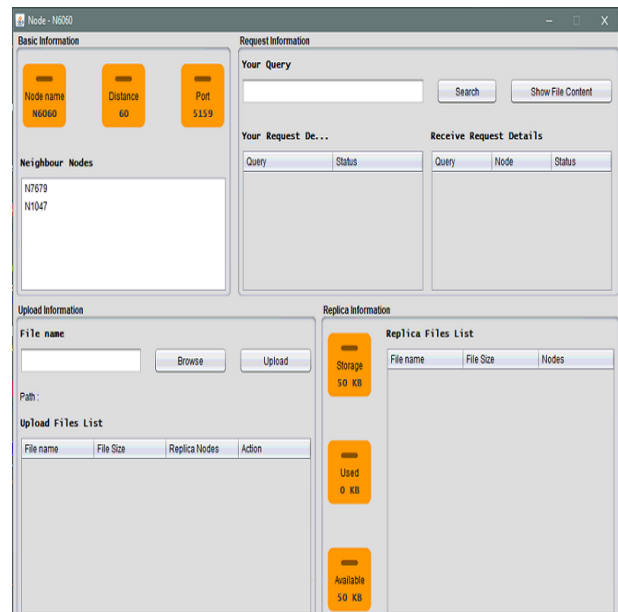
### 5. IMPLEMENTATION

The model application is achieved by using Java programming language, the Java swing API interface is utilized to construct UI and functionality is designed or actualize by utilizing systems network and IO programming interface exists in JDK. The application shows node to node concept where data sharing and replication are shown with the custom simulation application.



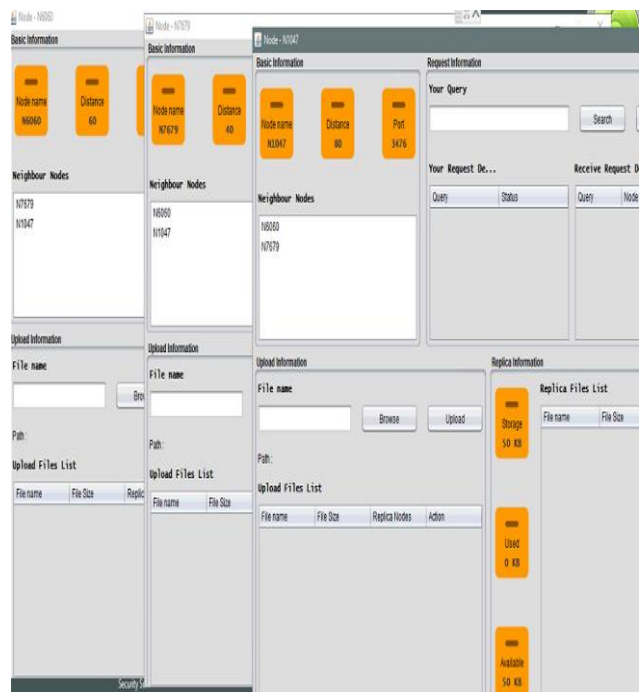
**Fig.3:- Block Diagram**

As appeared in above figure ,it is apparent that there are formal connections between the systems deployed in the systems. The interchanges are related to file sharing, data finding and the data replication.



**Fig -4: A Peer Node And Its Typical UI**

As appeared in fig ], it is apparent that the device is presenting a GUI program which contains the elements of file sharing applications. Actually a file sharing technique is utilized as underlying mechanism. There are provisions for requesting, finding, viewing files, uploading files for sharing and memory usage data.



**Fig.5: Shows Multiple Nodes in a Action**

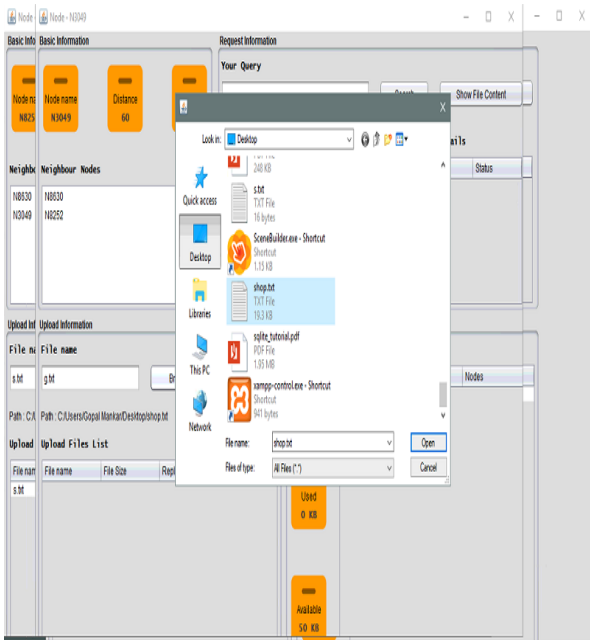


Fig.6: Shows the File Uploading

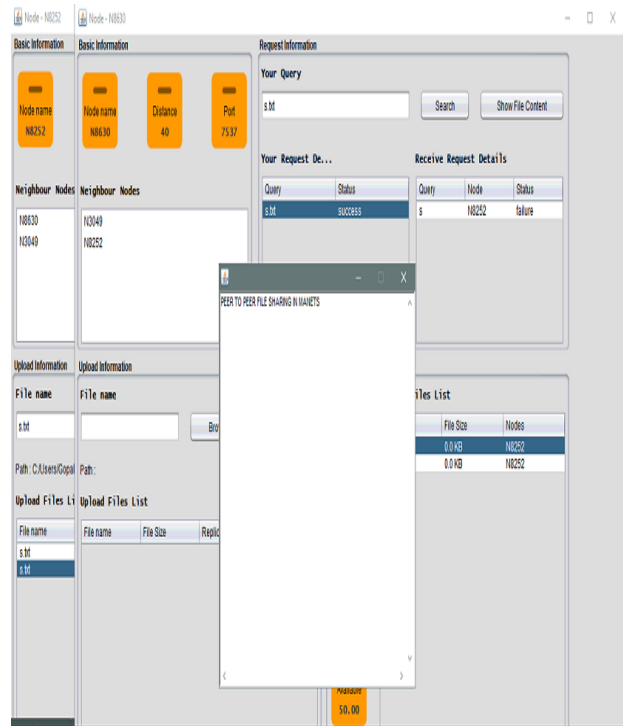


Fig.8: Shows the file content that queried

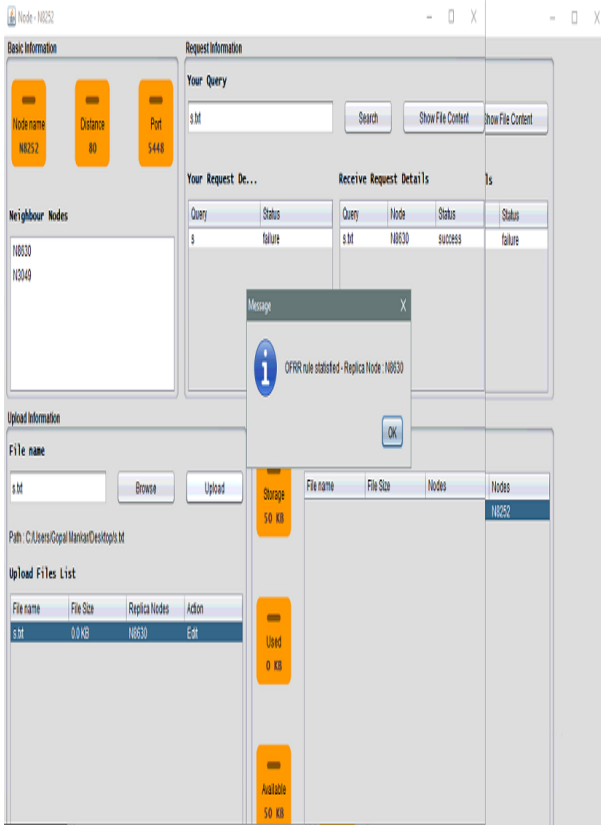


Fig.7: Shows OFRR rule get satisfied

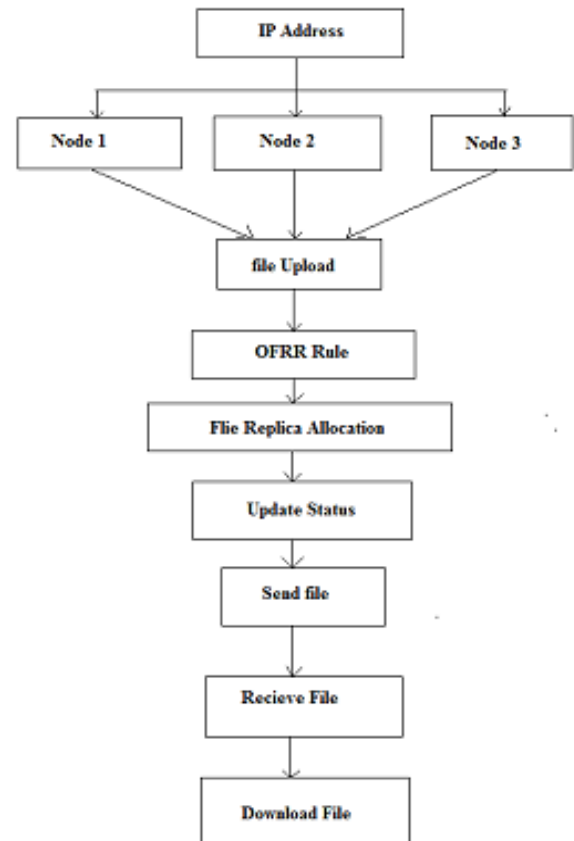


Fig.9: Flow Chart

As can be found in the above figures, there are one or more number of devices containing equal abilities are in real life. These devices can execute two actions. They are file sharing and data finding. These are two essential exercises actions utilized in the file sharing methods in this present reality. In the same manner, this application bolsters those two executions.

Also, there is a system for replication, which is designed and structured in each device in the system. The replication strategy guarantees that the file sharing effectiveness is enhanced and in addition it decreases memory utilization.

## 6. EXPERIMENTAL RESULTS

Table -1: Shows performance of different methods

OPT M	RANDO M	CACHE-DTN	DCG	PCS
0.66	0.65	0.66	0.67	0.66
0.63	0.63	0.63	0.64	0.62
0.62	0.61	0.61	0.59	0.6
0.59	0.58	0.57	0.56	0.55
0.52	0.52	0.53	0.53	0.5

Table -2: Shows performance of different methods

PCS	DCG	CACHE-DTN	RANDOM	OPTM
33	35	34	36	35
32.5	32.5	32	32	31.5
29	31	30	30	31
27.5	28.5	28.75	29	30
27	27	27.5	27.75	28

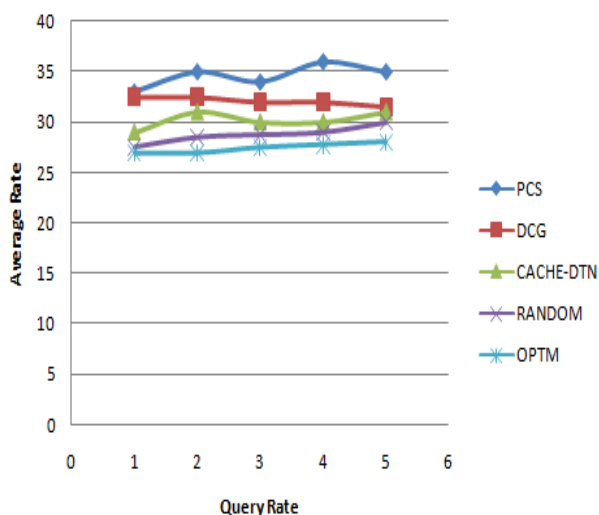


Fig.10:- Average delay vs. query rate

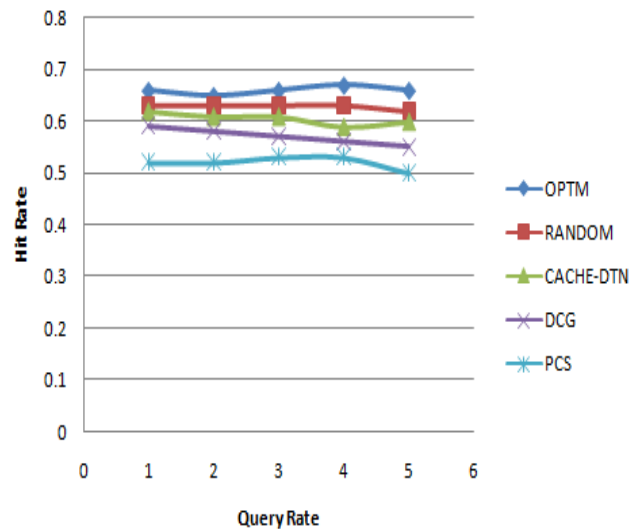


Fig.11:-Hit rate vs Query rate

## 7. CONCLUSION

In this paper, we examined the issue of file accessibility in file sharing applications that execute on MANET systems. And also inspect the issue of how to allot the finite resources for file replication for the intention to get an optimum data, finding capability in ad hoc network and investigate on file replica for the purpose to get effective file access accessibility. In the method we came to know the problems relating to limited resources and movability of ad hoc network

In this paper introduced a strategy that could decrease the load on the system by cautiously utilizing a replication technique that advances the file availability and resource utilization. We examine the effect of optimum copy dispersed in order to decrease the cunctation in requesting and enhance the file accessibility. We also assembled a model application which shows the confirmation of the idea. This examination can be expanded further by inspecting the tradeoff among the resource usage file accessibility when the replication strategy is utilized.

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