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MPT TECHNIQUE IN UNIFACIAL AND BI DIRECTIONAL PEER TO PEER WLAN FOR EFFICIENT DOWNLINK PERFORMANCE

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Abstract: **This paper proposes Multiple Packet Transmission (MPT) to multiple nodes in unidirectional and bi directional peer to peer wireless LAN for efficient downlink performance. This gives users the mobility to move around within a local coverage area and still be connected to the network. In this paper, we study a novel Multiple-Input, Multiple-Output (MIMO) technique called Multiple Packet Transmission (MPT) in unidirectional peer to peer WLAN, with which the sender can send more than one packet to distinct users simultaneously. The existing system was based on the sequence packet transmission method but this will not reduce the downloading time. It depends upon the client-server architecture that network cannot be expanded. The access point can send two packets to two users simultaneously. It depends upon the system hardware requirements. Paper proposes MPT- that is multiple transmission packets. This suggests sending packets to multiple systems simultaneously. In Bi directional P2P WLAN networks are typically used for connecting nodes, largely ad hoc connections. Data, including digital formats such as audio files, and real time data such as telephony traffic, is passed using P2P technology. The security issues in P2P network can be overcome with help of firewalls and TCP ports.**

Keywords: **Unifacial, MI MO, MPT, MAC, Switching, Collide, Encompassing, Napster.**

I. INTRODUCTION

The term "peer-to-peer" (P2P) refers to a class of systems and applications that employ distributed resources to perform a function in a decentralized manner by the deploying of computers, P2P focusing in research, product development, and investment circles and benefits improving scalability by avoiding dependency on centralized points; eliminating the costly infrastructure by enabling direct communication among clients; and enabling resource aggregation. This paper proposes simultaneous Multiple Packet Transmission (MPT) to multiple nodes in unidirectional peer to peer wireless LAN.

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A LAN consists of shared transmission medium and a set of hardware and software for interfacing devices to the medium and regulating the ordering access to the medium [2]. These are used to share resources (may be hardware or software resources) and to exchange information. LAN protocols function at the lowest two layers of the OSI reference model: the physical and data-link layers. The peer-to-peer application structure was popularized by file sharing systems like Napster, and its concept has inspired new structures and philosophies in many areas of human interaction. The IEEE 802 LAN is a shared medium peer-to-peer communications network that broadcasts information for all stations to receive. As a consequence, it does not inherently provide privacy [2]. A LAN enables stations to communicate directly using a common physical medium on a point-to-point basis without any intermediate switching node being required. There is always need for an access sub layer in order to arbitrate the access to the shared medium. The network is generally owned, used, and operated by a single organization. P2P networking allows computers to communicate directly with one another rather than through a central server like a website. This is in contrast to Wide Area Networks (WANs), which interconnect communication facilities in different parts of a country or are used as a public utility [2].Multiple Packet Transmission is used for efficient downlink performance. We study a novel Multiple-Input, Multiple-Output **(MIMO)** technique called Multiple Packet Transmission **(MPT)** in unidirectional peer to peer WLAN, By using Multiple Packet Transmission the sender can send more than one packet to distinct users simultaneously [1]. With the help of **MI** we can receive the input from the clients; Multiple Inputs depends on the Maximum Matching algorithm. Maximum Matching algorithm finds the nodes within the shortest path and transmits the packets in minimum time. With the help of MO we can transmit the output packets to the clients from the server. In this paper, we are using MAC layer for transmitting the packets. MAC is the sub layer of data link layer, it establish the communication between nodes in LAN. A network of computers based on multi-access medium requires a protocol for effective sharing of the media [2]. As only one node can send or transmit signal at a time using the broadcast mode, the main problem here is how different nodes get control of the medium to send data, that is "who goes next?".

The protocols used for this purpose are known as Medium Access Control (MAC) techniques. The key issues involved here are - Where and How the control is exercised. 'Where' refers to whether the control is exercised in a centralized or distributed manner.

In a centralized system a master node grants access of the medium to other nodes. Although this approach is easier to implement, it is vulnerable to the failure of the master node and reduces efficiency. On the other hand, in a distributed approach all the nodes collectively perform a medium access control function and dynamically decide which node to be granted access. This approach is more reliable than the former one. In MAC layer we are using Dynamic channel allocation for transmission; it considered nodes as independent stations. In fig1.1, each station has the complete knowledge of channel like whether the packet transmitting in same path or is there is any extra packets are transferring, station will control congestion across channels and maintains the channel Independent stations generates the packets for transmission, they should have the knowledge about channel (the channel is free to transmit the packets or not) and reduce the collisions.

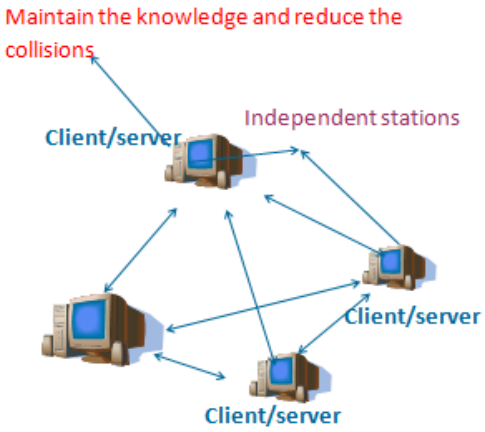


Fig 1.1: Medium access control techniques are designed with the Following goals in mind.

Initialization: The technique enables network stations, upon power-up, to enter the state required for operation.

Fairness: The technique should treat each station fairly in terms of the time it is made to wait until it gains entry to the network, access time and the time it is allowed to spend for transmission.

Priority: In managing access and communications time, the technique should be able to give priority to some stations over other stations to facilitate different type of services needed.

Limitations to one station: The techniques should allow transmission by one station at a time.

Receipt: The technique should ensure that message packets are actually received (no lost packets) and delivered only once (no duplicate packets), and are received in the proper order.

Error Limitation: The method should be capable of encompassing an appropriate error detection scheme.

Recovery: If two packets collide (are present on the network at the same time), or if notice of a collision appears, the method should be able to recover, i.e. be able to halt all the transmissions and select one station to retransmit.

II. PEER TO PEER NETWORK

Peer:

- A peer is a node on a P2P network that forms the fundamental processing unit of any P2P solution.
- Each peer has a unique Peer ID.
- Each peer belongs to one or several Peer Group.
- Each peer can communicate with other peers in its group and also those in other group
-

Peer Group:

- A set of peers formed to serve a common interest or goal dictated by the peers involved.
- Peer groups can provide services to their member peers that are not accessible by other peers in the P2P network.
- Peer groups can be divided by:
- The application they want to collaborate on as a group
- The security requirements of the peers involved
- The need for status information on members of the group

Basic P2P Elements :

Endpoints— the initial source or final destination of any piece of data being transmitted over the network**.** An endpoint corresponds to the network interfaces used to send and receive data

Pipes— Unidirectional, asynchronous, virtual communications channels connecting two or more endpoints

Messages— Containers for data being transmitted over a pipe from one endpoint to another.

Services provided by the P2P:

Functionality that peers can engage to perform useful work on a remote peer transferring a file, providing status information, performing a calculation, basically doing anything that you might want a peer in a P2P network to be capable of doing [3].This functionality could be provided by several members of the peer group, thereby providing redundant access to the service. As long as one member of the peer group is connected to the network and is providing the service, the service is available to the peer group

Protocols, what they need to do are:

- Finding peers on the network
- Finding what services a peer provides
- Obtaining status information from a peer
- Invoking a service on a peer
- Creating, joining, and leaving peer groups

Peer-to-peer (P2P) computing or networking:

It is a distributed application architecture that partitions tasks or workloads between peers. Peers are equally privileged, equipotent participants in the application [3]. They are said to form a peer-to-peer network of nodes. Peer-to-peer computing takes advantage of existing desktop computing power and networking connectivity, allowing economical clients to leverage their collective power to benefit the entire enterprise. In a peer-to-peer architecture, computers that have traditionally been used solely as clients communicate directly among themselves and can act as both clients and servers, assuming whatever role are most
efficient for the network.

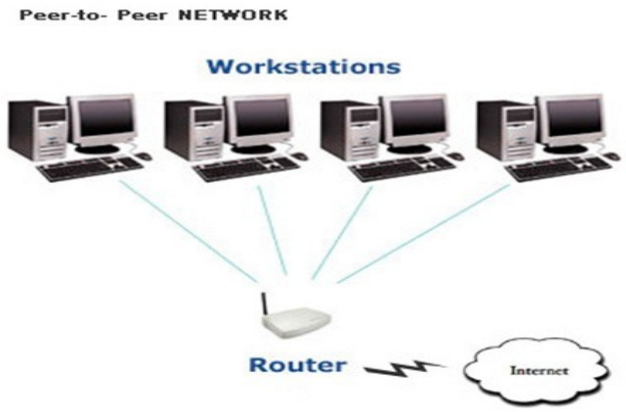


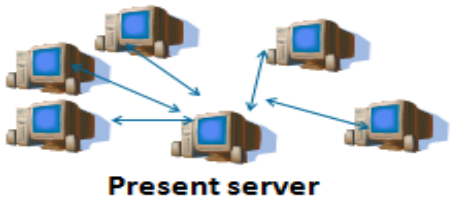
Fig 2.2: Peer to Peer Network

In fig 2.2, peers make a portion of their resources, such as
Processing power, disk storage or network bandwidth, directly available to other network participants, without the need for central coordination by servers or stable hosts [3]. Peers are both suppliers and consumers of resources, in contrast to the traditional client–server model where only servers supply, and
clients consume .As nodes arrive and demand on the system increases, the total capacity of the system also increases. In contrast, in typical client–server architecture, clients share only their demands with the system, but not their resources. In this case, as more clients join the system, less resource are available to serve each client. Structured P2P networks employ a globally
Consistent protocol to ensure that any node can efficiently route a search to some peer that has the desired file, even if the file is extremely rare. Such a guarantee necessitates a more structured pattern of overlay links. Peer-to-peer is a communications model in which each party has the same capabilities and either party can initiate a communication session. Other models with which it might e contrasted include the client/server model and the master/slave model. In some cases, peer-to-peer communications is implemented by giving each communication node both server and client capabilities. In recent usage, peer-to-peer has come to describe applications in which users can use the Internet to exchange files with each other directly or through a mediating server. As new processors and storage devices continue to break records in speed and capacity, supporting more powerful end devices throughout the network However, computation continues to accumulate around data center, which have to increase their workloads at a crippling pace, thus putting immense pressure on space and power consumption we are going to use peer-peer network.

III. UNIFACIAL PEER-TO-PEER

In fig 3.1, it allows only one task at a time (either sending or receiving).due to this traffic across the channel can be controlled when huge numbers of packets are transferring. By using this unidirectional architecture we can reduce collisions and packet delay over network. The maximum packet arrival rate increases significantly. In unifacial peer to peer networks we are using Maximum matching algorithm for performance calculation and it is used to find the shortest path between edges.

Fig 3.1: Unidirectional Peer-to-peer



It performs only one task either sending or receiving

Since maximum matching algorithms are relatively complex and may not meet the speed of real-time applications. We then study the performance of a wireless LAN enhanced with MPT and give analytical bounds for maximum allowable arrival rate. We also use an analytical model and simulations to study the average packet delay. Enhancing wireless LANs with MPT requires the Media Access Control (MAC) layer to have more knowledge about the states of the physical layer and is therefore a form of cross layer design. However, to the best of our knowledge, packet scheduling in wireless networks in the context of MPT has not been studied before. Lang et al and Dimic et al have considered Multiple Packet Reception (MPR), which means the receiver can receive more than one packet from distinct users simultaneously. [1].

IV. BIDIRECTIONALP2P

In Bi directional P2P WLAN networks are typically used for connecting nodes via largely ad hoc connections. There are three types of WLAN's. The first, peer-to-peer (P2P), enables wireless devices to directly communicate with each other without requiring the involvement of central access points.
The second WLAN type, which is a bridge, connects networks of different types, such as a wireless network to a wired Ethernet network. The third type is the wireless distribution system, where access points are used as repeaters in place of connecting all access points in a network using wires.

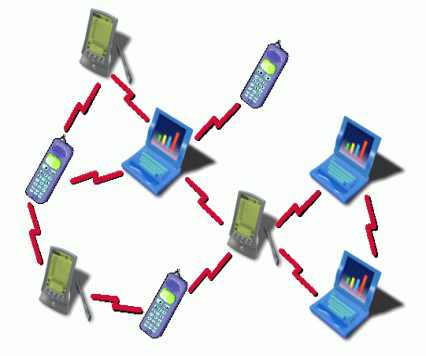


Fig 4.1: Bi Directional P2P Architecture

V. MULTIPLE PACKET TRANSMISSION (MPT)

In this paper, we are using Multiple-Input , Multiple-Output(MIMO) technique called **Multiple Packet Transmission (MPT)**.With the help of **MI** we can receive the input from the clients, It depends on the Maximum Matching algorithm [1].

Maximum Matching algorithm finds the nodes with in the shortest path and transmits the packets in minimum time. With the help of **MO** we can transmit the output packets to the clients from the server. In this project, we are using **MAC layer** for transmitting the packets.

Multiple packet transmission suggests for sending packets to multiple systems simultaneously. From access point it will send multiple packets to multiple users whenever possible.

VI. MAC LAYER FOR UNIFACIAL AND BI DIRECTIONAL P2P WLAN

MAC is the sub layer of data link layer, it establish the communication between nodes in LAN. In this project we are using **Dynamic channel allocation** for transmission; it considered nodes as independent stations. Independent stations generates the packets for transmission, they should have the knowledge about channel (the channel is free to transmit the packets or not) and reduce the collisions.

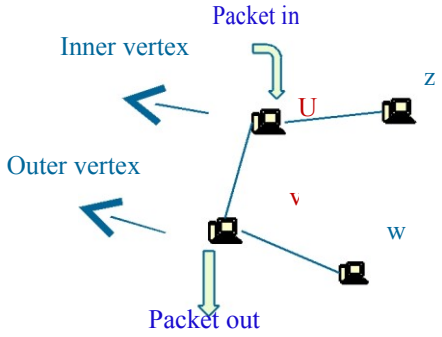
In MAC layer we are using Dynamic channel allocation for transmission; it considered nodes as independent stations. In each station has the complete knowledge of channel like whether the packet transmitting in same path or is there is any extra packets are transferring, station will control congestion across channels and maintains the channel.

Independent stations generates the packets for transmission, they should have the knowledge about channel (the channel is free to transmit the packets or not) and reduce the collisions. MAC layer is used for transmitting the packets. MAC is the sub layer of data link layer, it establish the communication between nodes in LAN. MAC provides features like priority, overrides, and guaranteed bandwidth. Simpler logic at each node, easy coordination.

VII. MAXIMUM MATCHING ALGORITHM

Maximum Matching algorithm finds the nodes within the shortest path and transmits the packets in minimum time [5]. It is used for performance calculation. It has O(|E|) time complexity, where |E| is the number of edges [1].

It calculate the time depending upon the inner and outer vertex (it calculate the packet in and out time). First it calculates the individual edges time then after calculate total edges time.



{
Here {u, v} are vertexes
O(|E|)=sum of edges.{eg: |E|+|F|+|G|}
Where |E|={u+v}
}

VIII. SYSTEM ARCHITECTURE

In the fig 8.1, it shows the total process of "Mpt technique in unifacial and bi directional peer to peer wlan for efficient downlink performance".

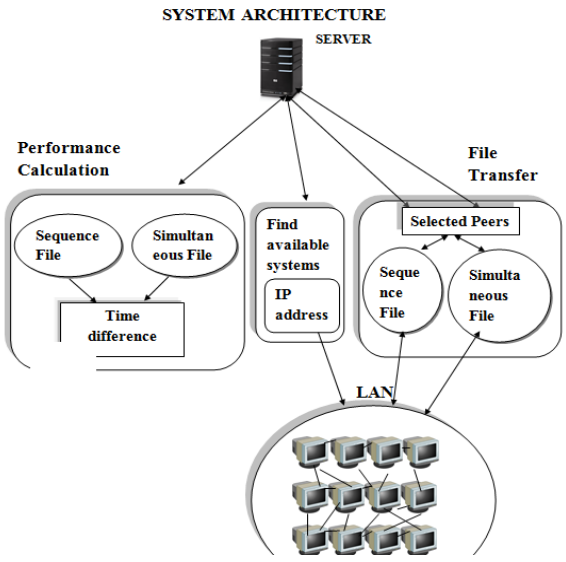


Fig 8.1: System Architecture

IX. FUTURE WORK

The Simultaneous Multiple Packet Transmission system in unifacial and bi directional P2P WLAN can be also implanted in web application. The number of file receiving systems can be increased.

X. CONCLUSION

We have introduced the concept of a Peer-to-Peer Wireless LAN Consortium. We motivated its existence and described its high-level architecture. We have considered using MPT to improve the downlink performance of the wireless LANs. In this paper individual stations having the responsibility to transmit the packets from source to destination or destination to source. If any server is removed from the system or goes down due to any problem the network can function with another server.

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