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# ENHANCEMENT OF SECURITY AGAINST DENIAL OF SERVICE ATTACKS IN WIRELESS MESH NETWORK

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**ABSTRACT:** A Denial-of-Service (DoS) attack a machine or network resources such as temporary or inexplicit interrupt or suspended services of a host connected to Internet as their aim is an attempt to restrict users. Distributed Denial-of-Service attack is where often multiple sources thousands of unique IP address. Shop or business of parties to enter into a valid state, not disrupting normal operations or business or a store entrance, a group of people rush to gate & is consistent. DoS attacks are often banks, credit card payment gateways on target host, as high-profile web servers are perpetrators of crime sites or services. Here in our research we would enhance security against Denial of service attack in wireless mesh network.

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**Keywords:** DOS, DDOS, WMN, Cryptography, Networking, Hackers

## [1] WIRELESS MESH NETWORK

A **wireless mesh network** (**WMN**)[4, 7] is a communications network made up of radio nodes organized in a mesh[7] topology. It is a type of wireless ad hoc network.[1] Wireless mesh networks often consist of mesh clients, mesh routers & gateways. Mesh clients are often laptops, cell phones & other wireless devices while mesh routers forward traffic to & from gateways that may, but need not, be connected to Internet. Coverage area of radio nodes working as a single network is sometimes known as a mesh cloud. Access to this mesh cloud is dependent on radio nodes working in harmony with each other to create a radio network. A mesh network is reliable & offers redundancy. When one node could no longer operate, rest of nodes could still communicate with each other, directly or through one or more intermediate nodes. Wireless mesh networks[7] could self form & self heal. Wireless mesh networks could be implemented with various wireless technologies including 802.11, 802.15, 802.16, cellular technologies & need not be restricted to any one technology or protocol.

## [2] DENIAL OF SERVICE ATTACK (DOS)

A Denial-of-Service (DoS) attack[3] a machine or network resources such as temporary or inexplicit interrupt or suspended services of a host connected to Internet as their aim is an attempt to make unavailable to users.

A Distributed Denial-of-Service (DDoS) attack[3] is where often multiple sources thousands of unique IP address. Shop or business of parties to enter into a valid state, not disrupting normal operations[14] or business or a store entrance, a group of people rush to gate & is consistent.

DoS attacks[13] are often banks, credit card payment gateways on target host, as high-profile web servers are perpetrators of crime sites or services

. Revenge, blackmail or other motives behind attacks may be active.

### *Attack Tools[3]*

Wide arrays of programs are used to launch DoS attacks. In cases such as my doom malw are tool embedded systems & have begun their attack without knowledge of owner. Stacheldraht is a classic example of DOS device. This is a multi-layered structure where

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attacker operators, that is system that zombie agent , that in turn issue orders to facilitate DDoS attacks are patched to connect to a customer uses program uses. Agents are compromised[11, 16] by attacker through operators automated routine use programs that accepts remote connections on remote host targets to exploit vulnerabilities. Each handler could control thousand agents.

***Denial- of -service Level***

DOS L2 ( possibly DDoS ) attack that blocks a safety net for goal of network is due to introduction of section from that attack began. Distributed attacks or IP header modi-fications (depending on type of behavior that security) completely block it from Internet to attack network, but without system in case of accident.

***Distributed attacks[8]***

A Distributed Denial of Service[2] (DDoS) Attack occurred when multiple system flood bandwidth or resources of objective system one or more web servers. These attacks constantly compromised systems traffic is a result of flooding in target system.

In order to achieve a bot net owner without knowledge of program is a network of zombie computers.[13] When a connection to server is overloaded with new connections could no longer be accepted. Distributed[8] denial of service attacks are major advantage of using an attacker than a machine could generate more attack traffic.

Multiple attack machines are hard to stop an attack & behaviour of each attack machine making it difficult to traces & off could be stealthier. These challenges cause attackers to gain security apparatus.

***Denial-of-Service (DoS) Level II***

DOS Level 2 (possibly DDoS) attack[9] that blocks a safety net for goal of network segment in which origin of attack would mean a launch. In distributed10] attack or IP header alteration depending on type of security[5] behaviour. attack networks completely block Internet, but without a system crash.

## [3] TOOLS & TECHNOLOGY

**Hardware requirement**

1. CPU (ABOVE 1GHZ)
2. RAM (1 GB)
3. HARDDISK (10GB FREE SPACE)
4. MONITOR
5. KEYBOARD
6. MOUSE

**Software Requirement**

1. Windows 7
2. Java development kit
3. Matlab

## [4] SOCKET PROGRAMMING IN JAVA

Socket programming is used for communication between applications running on different JRE. Socket programming could be connection-oriented or connection-less. Socket & Server Socket classes are used for connection-oriented socket programming & Datagram Socket & Datagram Packet classes are used for connection-less socket programming. client in socket programming must know two information IP Address of Server & Port number.

***Socket class***

A socket is simply an endpoint for communications between machines. Socket class could be used to create a socket.

### Important methods

| Method | Description |
|---|---|
| 1) public InputStream getInputStream() | returns InputStream attached with this socket. |
| 2) public OutputStream getOutputStream() | returns OutputStream attached with this socket. |
| 3) public synchronized void close() | closes this socket |

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***ServerSocket class***

The ServerSocket class could be used to create a server socket. This object is used to establish communication with clients.

## Important methods

| Method | Description |
|---|---|
| 1) public Socket accept() | returns socket & establish a connection between server & client. |
| 2) public synchronized void close() | closes server socket. |

## *Example of Socket Programming*

Let's see a simple of socket programming in that client sends a text & server receives it.

**File: MyServer.java**

```
import java.io.*;

import java.net.*;

public class MyServer {

public static void main(String[] args){

try{

ServerSocket ss=new ServerSocket(6666)
;

Socket s=ss.accept();//establishes connecti
on

DataInputStream dis=new DataInputStrea
m(s.getInputStream());

String  str=(String)dis.readUTF();

System.out.println("message= "+str);

ss.close();

}catch(Exception e){System.out.println(e)
;}  }}
```

**File: MyClient.java**

```
import java.io.*;

import java.net.*;

public class MyClient

{

public static void main(String[] args)

{

try

{

Socket s=new Socket("localhost",6666);

DataOutputStream dout=new DataOutput
Stream(s.getOutputStream());

dout.writeUTF("Hello Server");

dout.flush();

dout.close();

s.close();

}

catch(Exception e)

{

System.out.println(e);

}  } }
```

To execute this program open two command prompts & execute each program at each command prompt as displayed in below figure.

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```
C:\new>javac MyServer.java

C:\new>java MyServer
message= Hello Server

C:\new>
```

**Fig.1 Execution of server**

After running client application, a message would be displayed on server console.

```
C:\new>javac MyClient.java

C:\new>java MyClient

C:\new>
```

**Fig.2 Execution of Client**

## Socket Programming (Read-Write both side)

In this example, client[11] would write first to server then server would receive & print text. Then server would write to client[14] & client would receive & print text. step goes on.

**File: MyServer.java**

```
import java.net.*;

import java.io.*;

class MyServer{

public static void main(String args[])thro
ws Exception{

ServerSocket ss=new ServerSocket(3333)
;

Socket s=ss.accept();

DataInputStream din=new DataInputStrea
m(s.getInputStream());

DataOutputStream dout=new DataOutput
Stream(s.getOutputStream());

BufferedReader br=new BufferedReader(
new InputStreamReader(System.in));

String str="",str2="";

while(!str.equals("stop")){

str=din.readUTF();

System.out.println("client says: "+str);

str2=br.readLine();

dout.writeUTF(str2);

dout.flush();

}din.close();

s.close();

ss.close();

}}
```

**File: MyClient.java**

```
import java.net.*;

import java.io.*;

class MyClient{

public static void main(String args[])thro
ws Exception{

Socket s=new Socket("localhost",3333);

DataInputStream din=new DataInputStrea
m(s.getInputStream());

DataOutputStream dout=new DataOutput
Stream(s.getOutputStream());

BufferedReader br=new BufferedReader(
new InputStreamReader(System.in));

String str="",str2="";
```

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```
while(!str.equals("stop")){
str=br.readLine();
dout.writeUTF(str);
dout.flush();
str2=din.readUTF();
System.out.println("Server says: "+str2);
}  dout.close();
s.close();
}}
```

## [5] PROPOSED MODEL

In this research we have used socket programming in java to make a protocol. Commutative encryption[10,11,12] & watermarking in video compression. We would develop client server model so that data sent from client to serve[10]r could not we hacked or dropped by hacker as we have used our own protocol[1] to restrict unauthentic access from hacker[16].

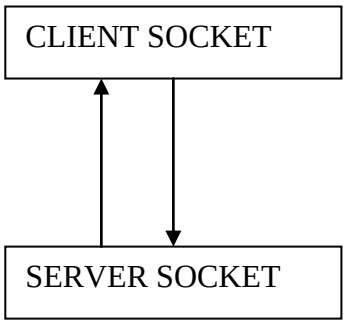
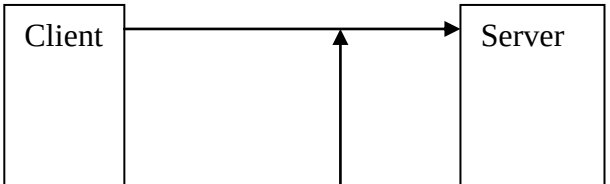



**Fig 3** Client server socket communication

This model would create a separate layer for data transmission & hacker[15] would not be capable to access data on wireless network without application layer required on client.



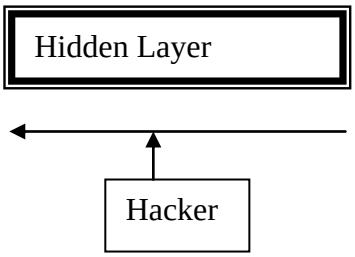




**Fig 4** Proposed Model

## [6] CONCLUSIONS

Wireless Mesh Network security[5] is basic requirement during data communication[12]. We made Implementation to enhance network security[8].
Data transmission could be made more secure from hacker[14] to by encrypting[18] data on sender side & decrypt[8] it on client side. But encryption cannot stop denial of service. As it does not matter what is actual data for hacker[16], he has to just destroy service so that no one could access it. Here we restrict unauthentic dropping of packets using our proposed model.

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