Aim: Write ns2 to test Simulated Application and Traffic generator application FTP over TCP.

Theory:
1. What is FTP?

FTP (File Transfer Protocol) is a network protocol for transmitting files between computers over Transmission Control Protocol/Internet Protocol (TCP/IP) connections. Within the TCP/IP suite,

FTP is considered an application layer protocol. In an FTP transaction, the end user's computer is typically called the *local host*. The second computer involved in FTP is a *remote host*, which is usually a server. Both computers need to be connected via a network and configured properly to transfer files via FTP. Servers must be set up to run FTP services, and the client must have FTP software installed to access these services.

2. What is TCP?

TCP stands for Transmission Control Protocol, a communications standard that enables application programs and computing devices to exchange messages over a network. It is designed to send packets across the internet and ensure the successful delivery of data and messages over networks.

TCP is one of the basic standards that define the rules of the internet and is included within the standards defined by the Internet Engineering Task Force (IETF). It is one of the most commonly used protocols within digital network communications and ensures end-to-end data delivery.

TCP organizes data so that it can be transmitted between a server and a client. It guarantees the integrity of the data being communicated over a network. Before it transmits data, TCP establishes a connection between a

source and its destination, which it ensures remains alive until communication begins. It then breaks large amounts of data into smaller packets, while ensuring data integrity is in place throughout the process.

3. What is the difference between them?

FTP is a file transfer protocol, which means it is used to transfer files between a client and a server, whereas TCP is a communication protocol used to exchange data between networks. They come together when FTP sends data over a TCP/IP connection.

NS2 script/code:

```
#Create a simulator object
set ns [new Simulator]

#Open the nam trace file
set nf [open out.nam w]
$ns namtrace-all $nf

#Define a 'finish' procedure
proc finish {} {
      global ns nf
      $ns flush-trace
       #Close the trace file
      close $nf
       #Execute nam on the trace file
      exec nam out.nam &
      exit 0
}

#Create two nodes
set n0 [$ns node]
```

```
set n1 [$ns node]

#Create a duplex link between the nodes
$ns duplex-link $n0 $n1 1Mb 10ms DropTail

#Create a UDP agent and attach it to node n0
set udp0 [new Agent/UDP]
$ns attach-agent $n0 $udp0

# Create a CBR traffic source and attach it to udp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $udp0

#Create a Null agent (a traffic sink) and attach it to node n1
set null0 [new Agent/Null]
$ns attach-agent $n1 $null0

#Connect the traffic source with the traffic sink
$ns connect $udp0 $null0

#Schedule events for the CBR agent
$ns at 0.5 "$cbr0 start"
$ns at 4.5 "$cbr0 stop"
#Call the finish procedure after 5 seconds of simulation time
$ns at 5.0 "finish"

#Run the simulation
$ns run
```
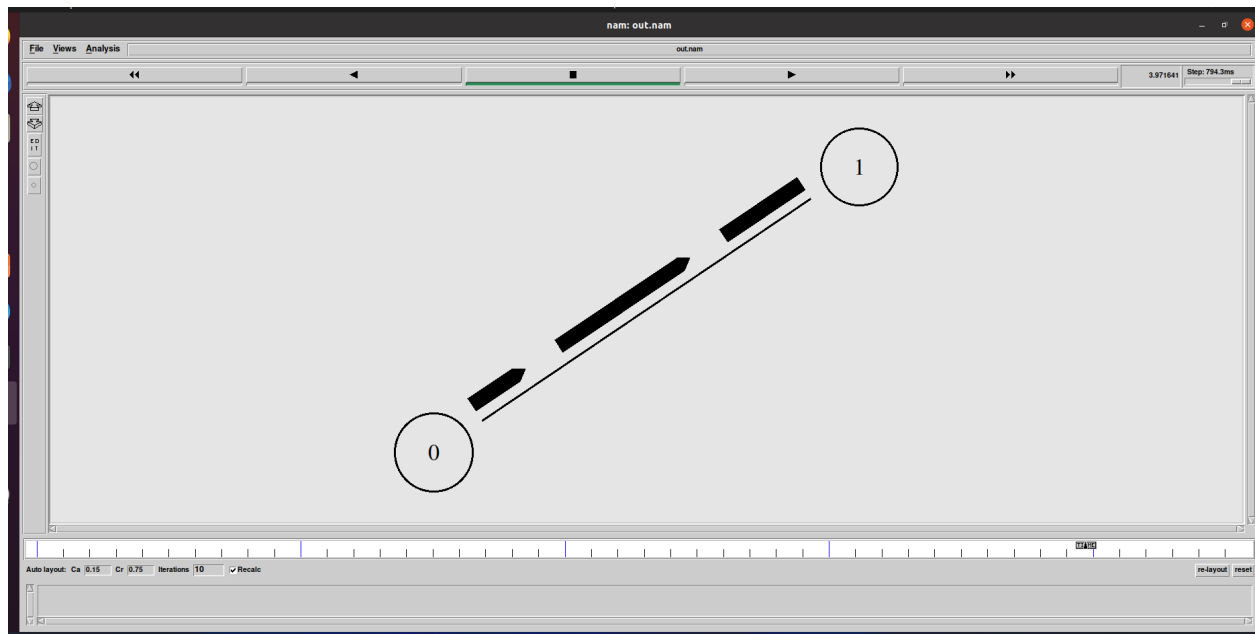
Output:

Conclusion:

We have performed the simulation using FTP over TCP.