**ASHESH KUMAR**

**501254**

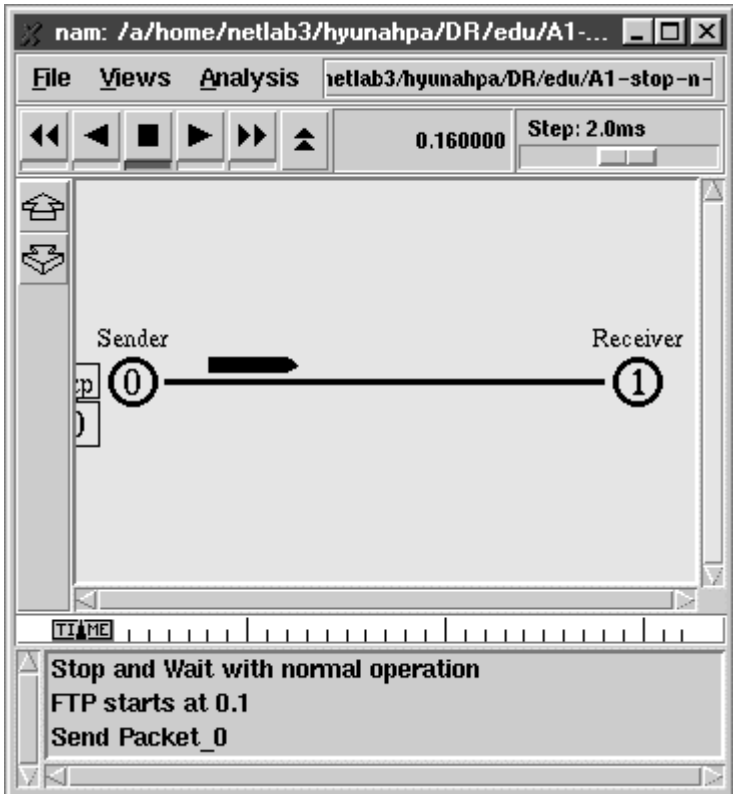
**I.T. IV**

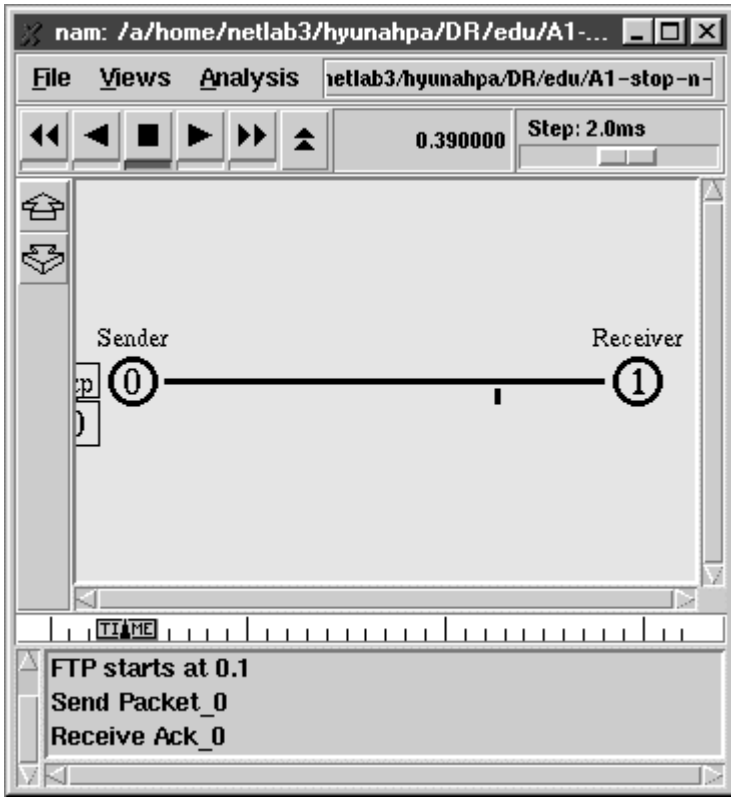
# STOP and WAIT Protocol in NS2

```
set ns [new Simulator]

set n0 [$ns node]
set n1 [$ns node]

$ns at 0.0 "$n0 label Sender"
$ns at 0.0 "$n1 label Receiver"

set nf [open A1-stop-n-wait.nam w]
$ns namtrace-all $nf
set f [open A1-stop-n-wait.tr w]
$ns trace-all $f

$ns duplex-link $n0 $n1 0.2Mb 200ms DropTail
$ns duplex-link-op $n0 $n1 orient right
$ns queue-limit $n0 $n1 10

Agent/TCP set nam_tracevar_ true

set tcp [new Agent/TCP]
$tcp set window_ 1
$tcp set maxcwnd_ 1
$ns attach-agent $n0 $tcp

set sink [new Agent/TCPSink]
$ns attach-agent $n1 $sink

$ns connect $tcp $sink

set ftp [new Application/FTP]
$ftp attach-agent $tcp

$ns add-agent-trace $tcp tcp
$ns monitor-agent-trace $tcp
$tcp tracevar cwnd_

$ns at 0.1 "$ftp start"
$ns at 3.0 "$ns detach-agent $n0 $tcp ; $ns detach-agent $n1 $sink"
$ns at 3.5 "finish"

$ns at 0.0 "$ns trace-annotate \"Stop and Wait with normal operation\""

$ns at 0.05 "$ns trace-annotate \"FTP starts at 0.1\""

$ns at 0.11 "$ns trace-annotate \"Send Packet_0\""
$ns at 0.35 "$ns trace-annotate \"Receive Ack_0\""
$ns at 0.56 "$ns trace-annotate \"Send Packet_1\""
$ns at 0.79 "$ns trace-annotate \"Receive Ack_1\""
$ns at 0.99 "$ns trace-annotate \"Send Packet_2\""
$ns at 1.23 "$ns trace-annotate \"Receive Ack_2  \""
$ns at 1.43 "$ns trace-annotate \"Send Packet_3\""
$ns at 1.67 "$ns trace-annotate \"Receive Ack_3\""
```

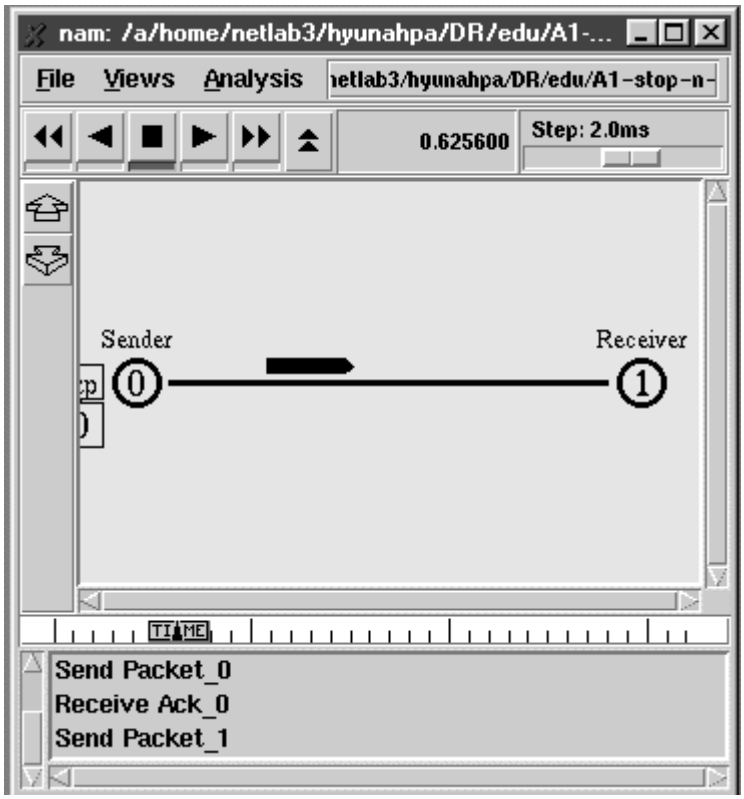
```
$ns at 1.88 "$ns trace-annotate \"Send Packet_4\""
$ns at 2.11 "$ns trace-annotate \"Receive Ack_4\""
$ns at 2.32 "$ns trace-annotate \"Send Packet_5\""
$ns at 2.55 "$ns trace-annotate \"Receive Ack_5    \""
$ns at 2.75 "$ns trace-annotate \"Send Packet_6\""
$ns at 2.99 "$ns trace-annotate \"Receive Ack_6\""

$ns at 3.1 "$ns trace-annotate \"FTP stops\""

proc finish {} {
 global ns nf
 $ns flush-trace
 close $nf

 puts "filtering..."
 exec tclsh ../ns-allinone-2.1b5/nam-1.0a7/bin/namfilter.tcl A1-stop-n-wait.nam
        puts "running nam..."
        exec nam A1-stop-n-wait.nam &
 exit 0
}

$ns run
```

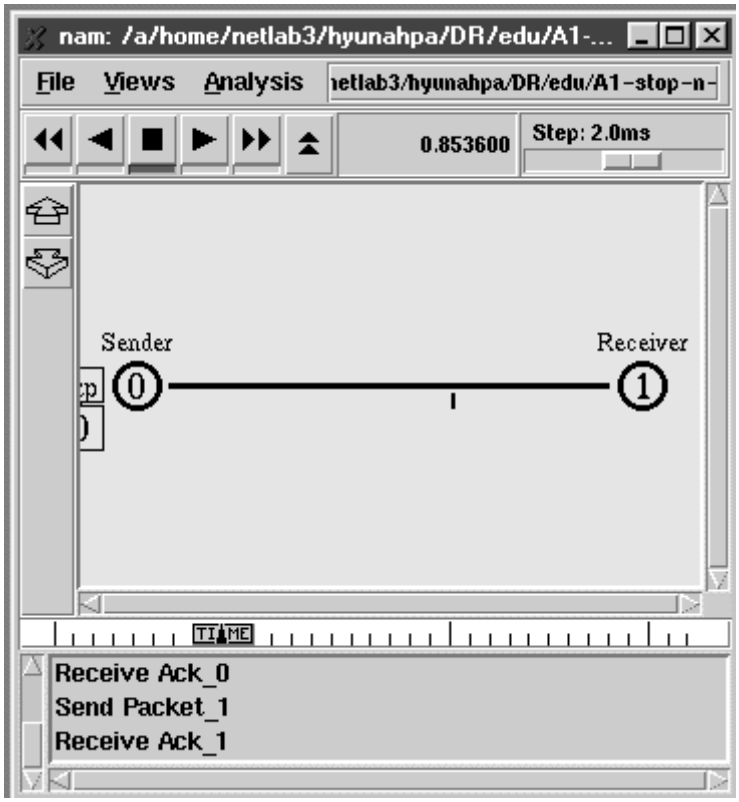
1. Packet_0 is sent and ACK_0 is received



2. Packet_1 is sent and ACK_1 is received




3. Packet_2 will be sent and be received and so on … … … …