NS2 Programming

Installation:

For installing NS2 in Linux(sudo), copy the following commands in the terminal:

sudo apt-get install ns2
sudo apt-get install nam
sudo apt-get install tcl

This will install the required softwares for NS2.

Programming:

Step-1:

In order to execute any NS2 program, we need a new simulator.
The following command will create a simulator.

set ns [new Simulator]

Step-2:

The next step is to create two files (.nam & .tr)
#Note: r indicates read mode
.nam - network animation file (for the animation)
.tr - trace file (for log)
Follow the commands:

set nf [open anim_file.nam r]
set tf [open trace_file.tr r]
$ns namtrace-all $nf
$ns trace-all $tf

Step-3:

Now we have to establish the network environment.

Step-3.1:(Establish Network Layer)
Creating the nodes and links.

To create nodes, follow the command:

set node_name [$ns node]

To create links between the nodes, follow the command:

$ns duplex-link $node_1 $node_2 bandwidth_in_Mb latency_in_ms DropTail

EX: *$ns duplex-link $n0 $n1 10Mb 300ms DropTail*

Step-3.2:(Establish Transport Layer)
Now create the transport layer protocols associated with the nodes.
Transport Layer protocols can be:
1. TCP
2. UDP
At receiver's end,
1. NULL (used with UDP)
2. TCPS - TCP Sink (used with TCP)

General syntax for creating transport layer:

set tlayer_name [new Agent/Protocol_Name]

For TCP:

set tcp [new Agent/TCP]

For UDP:

set udp [new Agent/UDP]

For TCPS:

set tcps [new Agent/TCPSink]

For NULL:

set null [new Agent/Null]

Now attach the transport layers to the network layers i.e., the nodes created.

$ns attach-agent $node_name $tlayer_name

Step-3.3:(Establish Application Layer)
Create the application layer traffic for the nodes and attach them to transport layers
There are several application layer protocols like
1. CBR - Constant Bit Rate (used with UDP)
2. FTP - File Transfer Protocol (used with TCP)
3. TELNET - Telephone Network (used with TCP)

General Syntax for creating application layer traffic

set alayer_name [new Application/Path_Of_Protocol]

For CBR:

set cbr [new Application/Traffic/CBR]

For FTP:

set cbr [new Application/FTP]

For TELNET:

set telnet [new Application/Telnet]

Now attach the application layers to the transport layers

$alayer_name attach-agent $tlayer_name

Step-4:

Connect nodes

$ns connect $tlayer_name_1 $tlayer_name_2

where
$tlayer_name_1 - sender's transport layer
$tlayer_name_2 - receiver's transport layer

Now the network is established and we have to start sending packets. This will be updated shortly.