**STUDY ON NETWORK SIMULATOR (NS2)**

**AIM**

To study network simulator version 2 (ns2)

**THEORY:**

NS2 stands for Network Simulator Version 2. **Network simulation** (NS) is one of the types of simulation, which is used to simulate the networks such as in MANETs, VANETs, etc. It provides simulation for routing and multicast protocols for both wired and wireless networks.

NS is licensed for use under version 2 of the GNU (General Public License) and is popularly known as **NS2**. It is an object-oriented, discrete event-driven simulator written in C++ and Otcl/Tcl.

NS-2 is an open-source event-driven simulator designed specifically for research in computer communication networks. It can be used to implement network protocols such as TCP and UDP, traffic source behavior such as FTP, Telnet, Web, CBR, and VBR, router queues management mechanisms such as Drop Tail, RED, and CBQ, routing algorithms, and many more.

In ns2, C++ is used for detailed protocol implementation and Otcl is used for the setup. The compiled C++ objects are made available to the Otcl interpreter and in this way, the ready-made C++ objects can be controlled from the OTcl level.

**Features of NS2**

1. It is a discrete event simulator for networking research.

2. It provides substantial support to simulate a bunch of protocols like TCP, FTP, UDP, https and DSR.

3. It simulates wired and wireless networks.

4. Uses TCL as its scripting language.

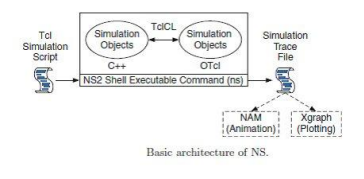
5. Otcl: Object oriented support

6. Tclcl: C++ and otcl linkage

7. Discrete event scheduler

**Basic Architecture**

NS2 consists of two key languages: C++ and Object-oriented Tool Command Language (OTcl). While the C++ defines the internal mechanism (i.e., a backend) of the simulation objects, the OTcl sets up simulation by assembling and configuring the objects as well as scheduling discrete events. The C++ and the OTcl are linked together using TclCL.



##### **Tool Command Language (Tcl)**

* Scripting language used to create configuration files in NS2.
* Used to build the network topology and structure
* It is easy to code and integrate with other languages like OTCL and C++
* Overall Script format contains[Simulator object, trace file, finish procedure, network setup(node, link, agent, parameter), event scheduling(run and stop simulation)]

##### **C++ programming**

* Compiled programming language used for protocol implementation in NS2**.**
* Used to implement the kernel of the architecture of protocol design
* File Extension used [.cc and .h]

**BASIC SAMPLE PROGRAM**

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| --- |
| **simple.tcl:**  set ns [new Simulator]  $ns at 1 “puts \“Hello World!\””  $ns at 1.5 “exit”  $ns run  **Output**  Hello world! |

**SAMPLE PROGRAM**

This sample program creates three nodes and link nodes by forming a ring topology

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| --- |
| **Test.tcl**  set ns [new Simulator]  set node\_0 [$ns node]  set node\_1 [$ns node]  set node\_2 [$ns node]  $ns duplex\_link $node\_0 $node\_1 1Mb 10ms RED  $ns duplex\_link $node\_1 $node\_2 1Mb 20ms RED  $ns duplex\_link $node\_2 $node\_0 1Mb 10ms RED |

**RESULT**

Hence study on network simulator version 2 is done