



# NetSim<sup>™</sup>

a versatile tool for your networks lab

# NetSim™

## Academic Ver 2.0

NetSim is a first of its kind educational network simulation software and has proved to be an indispensable tool for network lab experimentation, research and development. NetSim is being extensively used in hundreds of customer environments including premier educational institutes across India. Academic Version has several modules like simulation, programming, exercises and user management. Academic Ver 2.0 comes with several new protocols and network devices, all bundled together in a single component at an attractive price.

### Simulate

NetSim is a discrete event simulator developed using an object based modeling approach. The simulation module provides for hundreds of network experiments across various LAN and WAN protocols. Create Scenarios and study the performance of

#### Aloha, Slotted Aloha

#### Token Bus

As per IEEE 802.4 standard  
Solicit successor, who follows

#### Token Ring

As per IEEE 802.5 standard  
16Mbps and 4 Mbps data rates  
Interfaces between LLC and MAC, PHY and MAC

#### Ethernet Hub

As per IEEE 802.3 standard  
CSMA/ CD protocol  
Star and Bus topologies  
Multiple data rates 1 & 10 Mbps  
Truncated Binary Back off Algorithm with attempt limit of 16  
Inter frame gap

#### Ethernet Switch

As per IEEE 802.3 standard  
Cut through, Fragment free and Store and forward  
Implementation of the spanning tree algorithm  
User defined device buffer (up to 3Mb)  
1, 10 and 100 Mbps data rates  
Bit error insertion  
Cascading switches and connectivity to Hub

#### Wireless LAN

As per IEEE 802.11 b standard  
CSMA/ CA protocol - RTS / CTS exchange  
Infrastructure BSS, DCF mode  
Path loss with shadowing

#### TCP

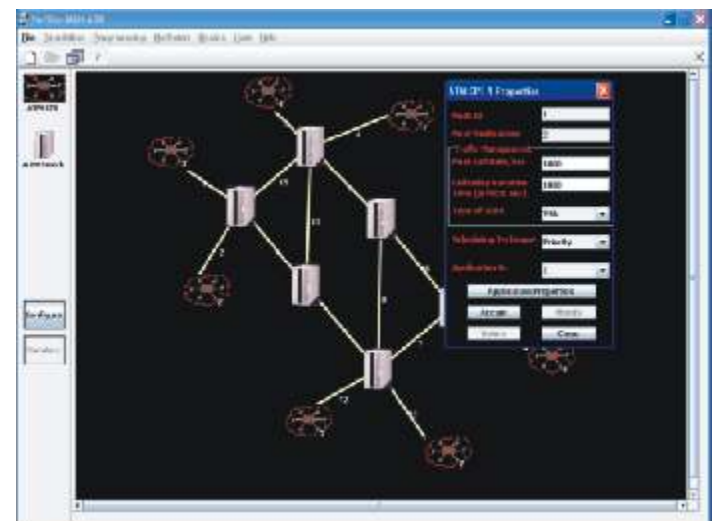
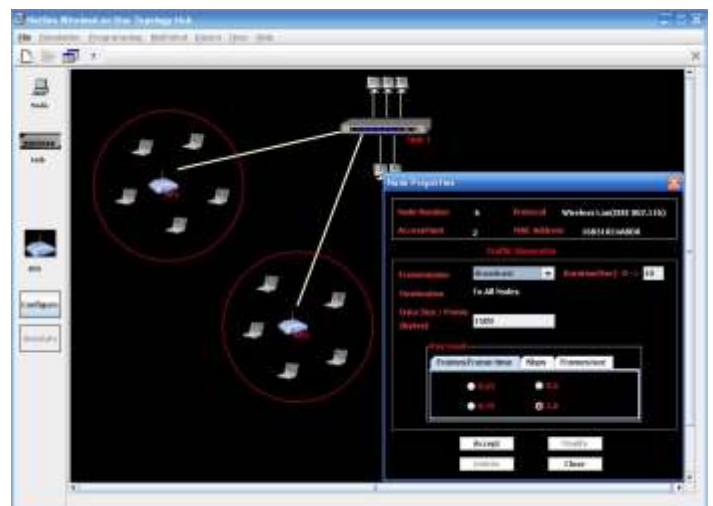
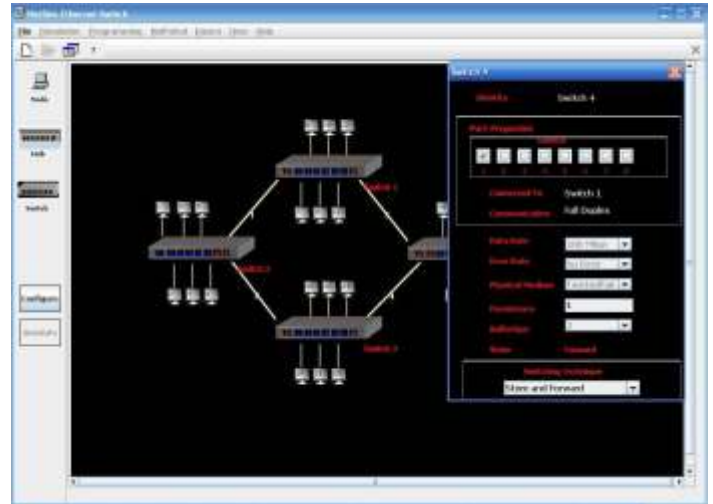
Old Tahoe and Tahoe flavours as per RFC 2001  
Retransmission timer management  
RTT Variance estimation using Jacobsons Algorithm  
Exponential RTO Backoff  
Karn's Algorithm  
Dynamic Window sizing on congestion

#### UDP

As per RFC 768 standard  
Connectionless transport layer service  
Encapsulation

#### Router

RIP algorithm v1 & v2 (RFC 1058, and RFC 2453)  
FIFO and Priority Queuing  
Implementation of Periodic Timer, Update timer, Invalid timer and Flush timers  
Routing tables containing Source Address, Destination Address, Next Hop, Cost and interface



Traffic Generator Poisson arrival with exponential inter-arrivals, Back log traffic. User defined traffic inputs in terms of Frames / sec or Kbps , simulation time and packet sizes

## Analyze

NetSim's advanced analysis module enables comprehensive intra and inter protocol analysis and comes with sophisticated graphing features and option to export data to spread sheets for further analysis.

### Experiments

Protocol vs Throughput / Response time  
 Error probability vs Throughput  
 Number of Nodes vs Throughput  
 Link rates vs Performance

Congestion control vs Throughput  
 Number of BSS vs Simulation time, Mean delay  
 CSMA/CA vs CSMA/CD, Aloha, Token ring, Token Bus  
 Used links vs Normalized Throughput

..... and hundreds more

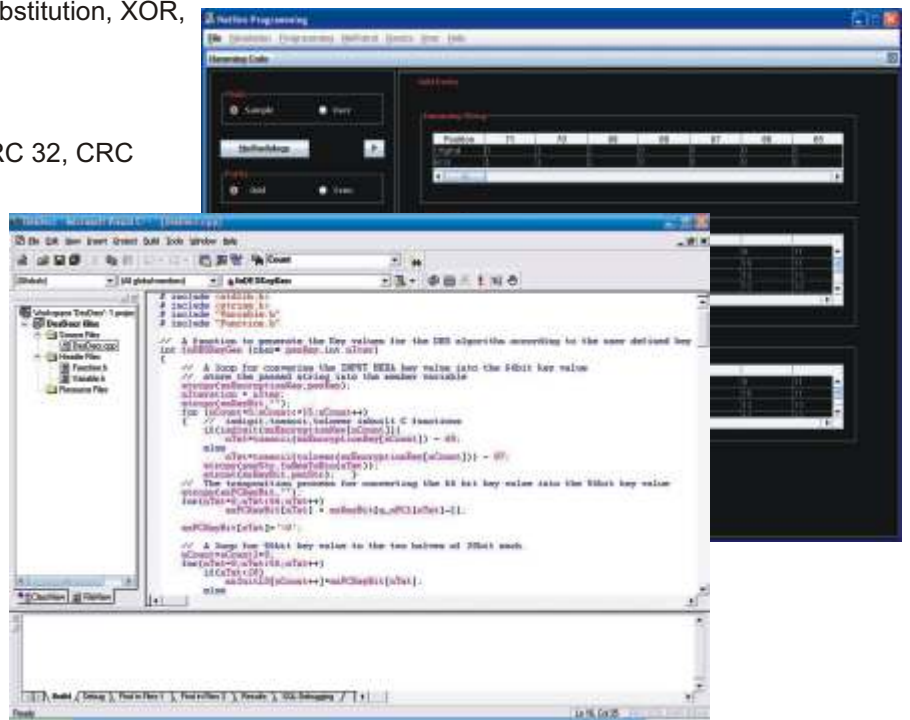
## Program

Assignment of sites  
 Address Resolution Protocol  
 Classless Inter Domain Routing  
 Cryptography DES, RSA, Transposition, Substitution, XOR, WEP  
 Distance Vector routing  
 Error correcting codes Hamming code  
 Error detecting codes CRC 12, CRC 16, CRC 32, CRC CCITT, LRC  
 Framing sequence Bit stuffing, character stuffing  
 Leaky Bucket Algorithm  
 Multi-level Multi-Access Collision Free Protocol  
 PC to PC Communication Encryption / decryption,  
 Socket Programming  
 Scheduling MMF and FIFO  
 Shortest path - Link state routing (Dijkstra's) and Floyd's algorithm  
 Sorting techniques Bubble, Insertion, Selection, Quick  
 Spanning Tree algorithms- Kruskal, Prims Boruvka  
 Sub-netting  
 Transmission Flow control Stop and Wait, Selective Repeat, Go Back N

C / C++ / Java Programming

Complete source code provided

Option to modify source code and link to default GUI



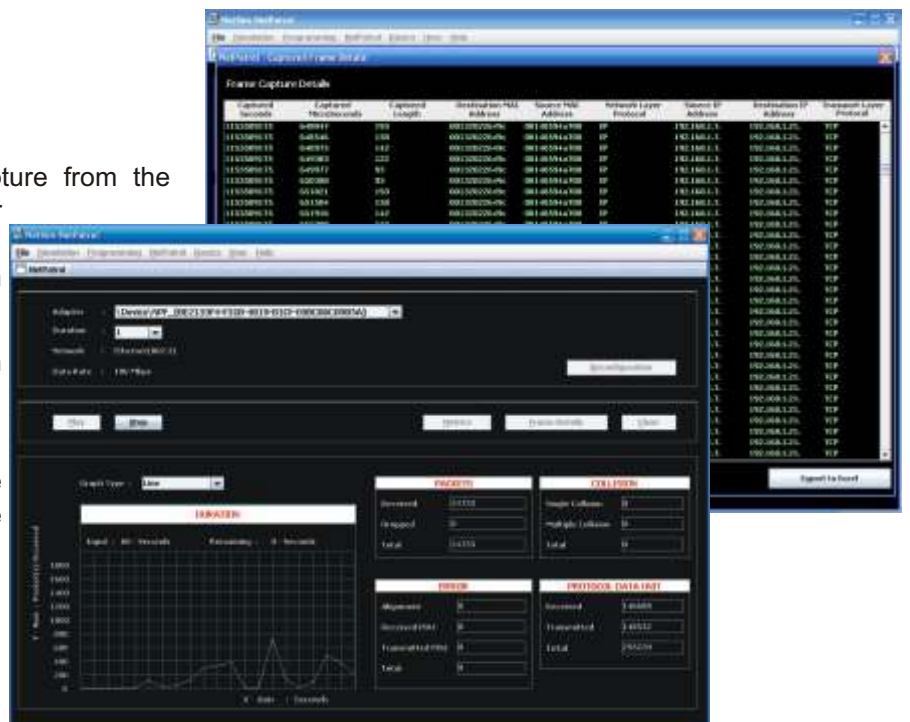
## Capture

Netpatrol facilitates real time packet capture from the institution's wired and Wi-Fi networks. User can interactively browse the captured data, viewing summary and detailed information for each packet.

Netpatrol has powerful features which enables the user to monitor traffic in real time across the network.

Information relating to protocols from all the different layers in made available. These protocols include Ethernet, IP, ARP, RARP, TCP, UDP, ICMP, FTP and HTTP.

Comparison between simulation and real time network is facilitated.



## Understand

The basics module consists of over 250 2D and 3D animations for visualization of networking principles and protocol functionalities.

Features include

**Motion** to develop a precise chronology of events. This comes with play, pause and slider bars to control the rate of animation progress.

**Detailing** with textual material to graphically simplify complex concepts and convey complicated network interrelationships.

**Viewpoint** can be dynamically changed to view objects at suitable levels.

## Manage

User Management through hierarchical control for Admin, Teacher and Student

Username and password protect for users at all levels

Enhanced data storage for saving projects, experiments reports and metrics files.

User mode and Exam mode with facility to disable help and source code during examination

## System Requirements

Pentium II or above, 64 MB RAM and 200 MB Hard Disk space,

OS: Windows 98 SE / ME / 2000 / XP / NT with service pack 4.0, Linux

LAN for PC to PC Communication

Connectivity for real time packet capture

### Select list of customers

Over 51 Institutions and 1000 Licenses

National Institute of Technology, Suratkal	Directorate of Technical Education, AP
National Institute of Technology, Surat	Directorate of Technical Education, Sikkim
National Institute of Technology, Bhopal	Directorate of Technical Education, Meghalaya
National Institute of Technology, Rourkela	State Project Implementation Unit, J & K
National Institute of Technology, Kurukshetra	Agra College of Engg, Agra
Anna Univ College of Engg, Guindy	Kalyani Govt Engg College, West Bengal
RV College of Engg, Bangalore	Institute of Technology & Management, Gwalior
JNTU College of Engg, Anantpur	All Saints College of Technology, Bhopal
Aligarh Muslim University, Aligarh	Chandigarh College of Engg & Tech, Chandigarh

### About Tetcos

Tetcos provides hardware and software utilities for domains spanning networking, communication, instrumentation and electronics. Founded in 1981, Tetcos has earned a reputation for reliability and domain expertise.

Tetcos' product suite include NetSim, Digital & Analog Communication Trainers and Local Area Network (LAN) Trainer. Tetcos' products have been operationally proven in hundreds of customer locales world over.

For more information about Tetcos and our products, visit [www.tetcos.com](http://www.tetcos.com)

*Technical review of scientific correctness, numerical results by Prof Anurag Kumar and architecture, code review by Prof K Gopinath of Indian Institute of Science (IISc) Bangalore*

*"We considered several other products, NetSim is the only one that fitted our UG Lab requirements perfectly"*

*Dr. Mayank Dave  
Asst. Professor & Chairman  
Computer Engg. Dept. NIT Kurukshetra*

*"NetSim has given our students an edge and has substantially improved their employability in the industry"*

*Imsayuba Naga  
Project Director  
State Project Implementation Unit*



*214, 7th Main, 39th A Cross, 5th Block, Jayanagar Bangalore, 560041  
Phone: 080-26650362 / 26652068*

*No 2089, 1267 Lake Side Avenue  
Sunnyvale, California, 94085 USA*

*Email: [sales@tetcos.com](mailto:sales@tetcos.com)  
Visit: [www.tetcos.com](http://www.tetcos.com)*