Network Simulation and Emulation Software
Trusted by 400+ Universities Across 25+ Countries for Network R&D and Lab Experimentation

New!
Satellite Communication

New!
5G NR mm Wave

New!
Software Defined Networks

New!
Vehicular Adhoc Networks

New!
Internet of Things

New!
Network Emulator
WHAT IS NETSIM® AND HOW IS IT USED?

NetSim is the industry’s leading network simulation software for protocol modelling and simulation, network R & D and defence applications.

It is an end-to-end, full stack, packet level network simulator and emulator, providing researchers with a technology development environment for protocol modelling and network R&D. The behaviour and performance of new protocols and devices can be investigated in a virtual network within NetSim at significantly lower cost and in less time than with hardware prototypes.

Design the network

- Create network scenarios using NetSim’s GUI or using XML config files
- Click and drop devices, links, application etc. into the environment using NetSim’s GUI
- Set properties with just a click. Layer-wise parameters can be edited

Run the simulation

- Run the Discrete Event Simulation (DES) through the GUI or CLI
- Log packet trace and event trace files
- Capture packets using Wireshark

Visualize the simulation - packet animator

- Animate packet flow over wired and wireless links
- Colour variation for control packets, data packets and error packets
- Animate mobility of devices
- Control animation with play, pause and simulation time-line

Analyze the results

- Examine output performance metrics at multiple levels - network, sub network, link, queue, application etc.
- Study a variety of metrics such as throughput, delay, loss, packet error, link utilization etc.
- Interpret metrics using in-built plots and graphs
- Create pivot tables and charts for visualization

Interface with external software

- MATLAB®
- SIMULINK®
- SUMO
- WIRESHARK
- Python

Develop your own protocol / algorithm

- Extend existing algorithms by modifying NetSim’s source C code
- Create custom protocols using NetSim’s simulation API’s
- Debug your code (step-in, step-out, step-over, continue) and watch your variables in sync with simulation
WHAT DOES NETSIM’S USER INTERFACE LOOK LIKE?

**Design Window**
- Devices & Links
- Application
- Traces
- Environment

**Animator Window**
- Speed Controls
- Play / Pause / Stop
- Animation Options
- Table Filters

**Results Window**
- Tabular Output
- Dynamic Metrics Plot
- Source Data
- Print
- Reset Plot
- Color Picker

**Plot Window**
- Packet & Event Trace
- Log files

**NetSim - Plots**
- 25+ Fields of Packet Information
EXPLORE THE WIDE RANGE OF PRODUCT CAPABILITIES

<table>
<thead>
<tr>
<th>Libraries (Toolboxes)</th>
<th>Networks / Protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component 1</strong></td>
<td>Inter-Networks: Ethernet - Fast &amp; Gigabit, ARP; WLAN - 802.11 a, b, g, n, ac and e Propagation - Pathloss, Shadowing, Fading; IPv4, Firewalls Routing - RIP, OSPF; Queuing - Round Robin, FIFO, Priority; TCP - Old Tahoe, Reno, New Reno, BIC, CUBIC, SACK, Window Scaling; UDP</td>
</tr>
<tr>
<td>(Base. This is required for all other components to run)</td>
<td>Common Modules: Applications (Traffic Generator): Voice, Video, FTP, Database, HTTP, Email, Peer-to-peer and Custom; Encryption - XOR, TEA, AES, DES; Virtual Network Stack, Simulation Kernel; Command Line Interface, Metrics Engine with Packet Trace and Event Trace; Packet Animator, Results window with dynamic plots; Command Line Interpreter</td>
</tr>
<tr>
<td></td>
<td><strong>External Interfaces</strong>: Wireshark and MATLAB interfaces</td>
</tr>
<tr>
<td><strong>Component 2</strong></td>
<td><strong>Legacy &amp; Cellular Networks</strong>: Pure Aloha &amp; Slotted Aloha, GSM and CDMA</td>
</tr>
<tr>
<td><strong>Component 3</strong></td>
<td><strong>Advanced Routing and Switching</strong>: IGMP, PIM, VLAN, ACL, NAT, Layer 3 Switch</td>
</tr>
<tr>
<td><strong>Component 4</strong></td>
<td><strong>Mobile Adhoc Networks</strong>: MANET - DSR, AODV, OLSR, ZRP; Multiple MANETs, Interfacing with Bridge Node</td>
</tr>
<tr>
<td><strong>Component 5</strong></td>
<td><strong>Software Defined Networks</strong>: Open flow v1.3 Compatible</td>
</tr>
<tr>
<td><strong>Component 6</strong></td>
<td><strong>Internet of things</strong>: IoT with RPL protocol Wireless Sensor Networks (WSN) LR-WPAN 802.15.4, Energy model</td>
</tr>
<tr>
<td>(Requires C4)</td>
<td><strong>Component 7</strong></td>
</tr>
<tr>
<td><strong>Component 8</strong></td>
<td><strong>Long-Term Evolution Networks</strong>: LTE (4G), LTE Advanced (4.5G)</td>
</tr>
<tr>
<td><strong>Component 9</strong></td>
<td><strong>Vehicular Adhoc Networks</strong>: IEEE 1609 WAVE, Basic Safety Message (BSM) protocol per J2735 DSRC, Interface with SUMO for road traffic simulation</td>
</tr>
<tr>
<td>(Requires C4)</td>
<td><strong>New! Component 10</strong></td>
</tr>
<tr>
<td>(Requires C3. Requires C8 for NSA mode)</td>
<td><strong>New! Component 11</strong></td>
</tr>
<tr>
<td>(Requires C3)</td>
<td><strong>Network Emulator Add On</strong>: <strong>Network Emulator</strong>: Connect real hardware running live applications to NetSim Simulator. Interface with Raspberry Pi</td>
</tr>
</tbody>
</table>
Overview

- End-to-End simulation of 5G networks
- Devices: UE, gNB, EPC, Router, Switch, Server
- Interfaces with NetSim’s proprietary TCP/IP stack providing simulation capability across all layers of the stack
- Application Models - FTP, HTTP, Voice, Video, Email, DB, Custom and more
- 5G Core covering AMF, SMF and UPF. SA and NSA and NSA (LTE-5G dual connectivity) deployment architectures

Specifications

- SDAP based on specification: 37.324, RLC based on specification 38.322 and PDCP based on specification 38.323
- MAC Layer based on specification 38.321
  - MAC Scheduler featuring Round Robin, Proportional Fair, Max Throughput and Strictly fair algorithms
  - Link Adaptation to change MCS based on CQI
- PHY Layer
  - Flexible sub-carrier spacing in the NR frame structure using multiple numerologies $\mu = 0, 1, 2, 3$
  - Carrier aggregation
  - CQI - MCS - TBS
  - PHY layer modulations supported - BPSK, QPSK, 16QAM, 64QAM, 256QAM
  - MIMO operation with layer count equal to Min (Tx-antenna-count, Rx-Antenna-count).
    - gNB antenna count supported 1, 2, 4, 8, 16, 32, 64, 128
    - UE antenna count supported 1, 2, 4, 8, 16
  - MIMO Spatial channel model
    - MIMO Spatial Channel Model (SCM), i.e., the channel is represented by a matrix $H$, whose entry $(t, r)$ models the channel between the $t$-th and the $r$-th antenna elements at the transmitter and the receiver.
    - Gaussian channel with Rayleigh fast fading: i.i.d Complex Normal $(0, 1)$ channel ($H$-matrix) that changes independently every coherence time.
  - Beamforming gain per the eigen values of the covariance (Wishart) matrix
- RF propagation (Based on 3GPPTR38.900 Channel Model)
  - Rural Macro, Urban Macro, Urban Micro, Indoor, Mixed and Open Office. LOS/NLOS. Outdoor to Indoor
  - Handover - Mobility and Handover

Featured Examples

- Effect of distance on pathloss for different channel models - Rural-Macro, Urban-Macro, Urban-Micro
- Effect of UE distance on throughput in FR1 and FR2
- Impact of MAC Scheduling algorithms on throughput, in a Multi UE scenario
- 5G Peak Throughput: 3.5 GHz n78 band, 26 GHz n258 band
- Impact of numerology on a RAN with phones, sensors, and cameras
- 4G vs. 5G: Capacity analysis for video downloads
HOW DO I WRITE MY OWN CODE/ALGORITHM?

Protocol Libraries
provided in source C code form with necessary API’s and documentation

User Generated Libraries
can be created by modifying protocol source C code

Development Environment
in NetSim enables you to call into NetSim user generated libraries to run network scenarios

Detailed Simulation Report
of user generated libraries covering millions of packets and events are available for detailed analysis

WHAT ARE SOME RESEARCH AREAS WHERE NETSIM IS USED?

List of R&D projects with code and documentation is available at www.tetcos.com/file-exchange

5G NR Networks
» End to End simulation of 5G NR
» Radio numerology and impact on latency
» Channel models for FR1 and FR2

Vehicular Adhoc Networks (VANETs)
» v2v and v2i communication
» Mobility models and connectivity
» Clustering and routing

Internet Of Things (IoT)
» IoT security
» Energy management and sustainable operation
» 6LoWPAN based IoT design

Cognitive Radio Networks (WRAN)
» Spectrum sensing and incumbent detection
» Spectrum allocation
» Interference analysis, spectrum usage

Wireless Sensor Networks (WSN)
» Energy efficiency
» Routing, Clustering and LEACH
» Localization

Mobile Ad hoc Networks (MANET)
» Location based, Power aware routing
» Sinkhole attack
» Intrusion detection systems

Software Defined Networks (SDN)
» SDN based Wired/Wireless/MANETs/VANETs
» Performance evaluation
» SDN based traffic engineering and QoS
HOW DO I CONNECT REAL DEVICES TO NETSIM FOR EMULATION?

NetSim emulator provides critical insights into application performance by enabling user to run their live application over an equivalent virtual network and see how the application is performing in real time.

NetSim is an IP based, data plane, flow-through network emulator; NetSim emulates the network for the data flowing between the client(s) and server(s).

What is Emulation?

» NetSim Emulator enables users to connect NetSim simulator to real hardware and interact with live applications
» Users can test the performance of real applications over a virtual network.
» If you are designing a new network or expanding an existing network then NetSim emulator will enable you to run your live application over an equivalent virtual network and see how the application is performing in real time

Where can it be used?

» Military radio networks
» Satellite link analysis
» Metro rail networks
» R&D in new protocol design

How does it work?

» Create the desired network in the Emulation server using NetSim GUI
» Route traffic from the PC’s/VM’s where your application runs, to NetSim emulation server
» Each live PC/VM corresponds to a node in the simulated network.
» In the simulated network map the device IP addresses per the real PC/VM
» Run your application & Measure various parameters such as throughput, delay, loss etc. for your live application using Wireshark

What are the benefits?

» Can be used to emulate a wide range of technologies
» Switching, Routing, MANETs, 4G-LTE networks etc.,
» NetSim Emulator is a cost effective alternative to hardware emulators that have high costs, complicated configuration requirements and limited scale
TEACH WITH NETSIM

NetSim features in-built sample experiments to teach networking fundamentals through simulation.

List of Experiments

With comprehensive documentation covering Objective, Theory, Network Set-up, Results and Discussion

1. Introduction to NetSim
2. Understand Measures of Network Performance: Throughput and Delay
3. Understand working of ARP, and IP Forwarding within a LAN and across a router
4. Simulate and study the spanning tree protocol
5. Introduction to TCP connection management
6. Reliable data transfer with TCP
7. Mathematical Modelling of TCP Throughput Performance
8. Study how throughput and error of a Wireless LAN network changes as the distance between the Access Point and the wireless nodes is varied
9. Wi-Fi: UDP Download Throughput
10. How many downloads can a Wi-Fi access point simultaneously handle?
11. TCP Congestion Control Algorithms
12. Multi-AP Wi-Fi Networks: Channel Allocation
13. Plot the characteristic curve of throughput versus offered traffic for a Pure and Slotted ALOHA system
14. Study the working and routing table formation of Interior routing protocols, i.e. Routing Information Protocol (RIP) and Open Shortest Path First (OSPF)
15. M/D/1 and M/G/1 Queues
16. Wi-Fi Multimedia Extension (IEEE 802.11 EDCA)
17. Analyze the performance of FIFO, Priority and WFQ Queuing Disciplines
18. Cyber physical systems (CPS) and IoT – An Introduction
19. One Hop IoT Network over IEEE 802.15.4
21. Study how call blocking probability varies as the load on a GSM network is continuously increased
22. Study the 802.15.4 Superframe Structure and analyze the effect of Superframe order on throughput
23. Understand the working of OSPF
24. Understand the working of basic networking commands (Ping, Route Add/Delete/Print, ACL)
25. Study how the throughput of LTE network varies as the distance between the eNB and UE (User Equipment) is increased
26. Study how the throughput of LTE network varies as the Channel bandwidth changes in the eNB (Evolved node B)
27. To analyze how the allocation of frequency spectrum to the Incumbent (Primary) and CR CPE (Secondary User) affects throughput
28. Simulate and study 5G Handover procedure
29. Understanding VLAN operation in L2 and L3 Switches Introduction to VLAN
30. Understanding Access and Trunk Links in VLANs
31. Understanding Public IP Address & NAT (Network Address Translation)
32. Understand the events involved in NetSim DES (Discrete Event Simulator) in simulating the flow of one packet from a Wired node to a Wireless node
33. Understand the working of TCP BIC Congestion control algorithm, simulate and plot the TCP congestion window
34. Simulating Link Failure

View complete Experiments manual online at
## HOW DOES NETSIM COMPARE WITH COMMERCIAL SIMULATORS?

<table>
<thead>
<tr>
<th><strong>Modeling and Simulation</strong></th>
<th><strong>Commercial Simulators</strong></th>
<th><strong>NetSim™ Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>5G NR</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Internet of Things (IoT)</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Software Defined Networks</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Vehicular Adhoc Networks</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Cognitive Radio Networks</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Special utilities: Config file generator, Batch simulation manager, Multi-parameter sweeper</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Special modules for LEACH, Node Failure, Intrusion detection and Sink hole attacks</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Results dashboard with plots of simulation parameters over time</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Core Architecture**

<table>
<thead>
<tr>
<th>Protocol Source Code</th>
<th><strong>Commercial Simulators</strong></th>
<th><strong>NetSim™ Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>C++</td>
<td></td>
<td>C</td>
</tr>
<tr>
<td>Writing and building custom code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>De-bugging custom code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packet Animation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workspaces: for multiple code bases (and associated experiments)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Licensing**

<table>
<thead>
<tr>
<th>License validity</th>
<th><strong>Commercial Simulators</strong></th>
<th><strong>NetSim™ Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td></td>
<td>Annual/Perpetual</td>
</tr>
<tr>
<td>Cloud Licenses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Documents and Projects**

| Sample Projects based on referenced IEEE papers | **Commercial Simulators** | **NetSim™ Standard** |
|                                                |                           |                     |
| Project Source Code                            |                           |                     |
| Lab Experiment manual                          |                           |                     |

**External Interfaces**

<table>
<thead>
<tr>
<th>MATLAB® Interface</th>
<th><strong>Commercial Simulators</strong></th>
<th><strong>NetSim™ Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>SUMO Interfacing for VANETs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wireshark interface</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Support and Training**

<table>
<thead>
<tr>
<th>E-mail &amp; Phone Support</th>
<th><strong>Commercial Simulators</strong></th>
<th><strong>NetSim™ Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>On-site Support &amp; Training</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+ per publicly available information at time of print
## HOW DOES NETSIM COMPARE WITH OPEN SOURCE SIMULATORS?

<table>
<thead>
<tr>
<th>Feature</th>
<th>Open Source Simulators</th>
<th>NetSim™ Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Install</strong></td>
<td>Complicated installation process. Requires knowledge of various compilers and support packages for Python, QT, Doxygen, Mercurial, TCP Dump, and more</td>
<td>Two minute click-through installation</td>
</tr>
<tr>
<td><strong>OS/Compiler Support</strong></td>
<td>Linux/gcc / g++</td>
<td>Windows/Visual Studio (community Edition)</td>
</tr>
<tr>
<td><strong>Ease of Use</strong></td>
<td>Write hundreds of lines of script code to create network scenarios. Need to know various scripting and programming languages</td>
<td>Easy to use GUI allows users to simply drag and drop devices, links and applications</td>
</tr>
<tr>
<td><strong>Simulation Output</strong></td>
<td>Analyse and write code to extract performance results from multi megabyte files</td>
<td>Results dashboard provides appealing simulation performance reports with tables &amp; graphs</td>
</tr>
<tr>
<td><strong>Data Visualization</strong></td>
<td>Fragmented tools with each requiring users to write programs for visualization</td>
<td>Inbuilt graphing with extensive formatting (axes, colours, zoom, titles etc)</td>
</tr>
<tr>
<td><strong>Technologies</strong></td>
<td>Limited technologies Stand alone</td>
<td>Wide range of technologies including the latest in IoT, WSN, MANET, VANET, SDN, LTE-Adv Cognitive Radio, 802.11 n / ac.. and more. Libraries work together</td>
</tr>
<tr>
<td><strong>Lab Experimentation</strong></td>
<td>Unsure of the quality of the build / patch you have used and if the results are even valid at the end</td>
<td>Comes with a pre-built set of 30-experiments covering important networking concepts</td>
</tr>
<tr>
<td><strong>External Interface</strong></td>
<td>Spend many days researching how to link to external software</td>
<td>Inbuilt interfaces to external software like MATLAB®, SUMO and Wireshark</td>
</tr>
<tr>
<td><strong>Easy Debug</strong></td>
<td>Code tens of printf statements to debug your code</td>
<td>Online debug capability and ability to 'watch' all variables. Run animation in parallel for immediate visual feedback</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td>No personalized ontime support Users dependent on online resources which require advanced programming knowledge</td>
<td>Professional support via email, helpdesk, remote desktop and phone</td>
</tr>
</tbody>
</table>

* per publicly available information at time of print
HOW DO THE DIFFERENT VERSIONS OF NETSIM COMPARE?

NetSim Standard and NetSim Academic are targeted at educational institutions. NetSim Pro is supplied to Defence and Industry. Please visit [www.tetcos.com](http://www.tetcos.com) for more information on NetSim Pro.

### Technology Coverage

<table>
<thead>
<tr>
<th>Feature</th>
<th>NetSim® Academic</th>
<th>NetSim® Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internetworks</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Legacy Networks</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SDN</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>MANETs</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>Cellular Networks</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>Wireless Sensor Networks</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>Internet Of Things</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>Cognitive Radio Networks</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>LTE/LTE-A Networks</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>VANETs</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>5G NR mmWave Networks</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>Satellite Communication Networks</td>
<td>×</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Performance Reporting

- Performance metrics available for Network and Sub-network

### Packet Animator

- Used to animate packet flow in network

### Packet Trace

- Available in csv format for easy post processing

### Protocol Library Source Codes with Documentation

- Protocol C source codes with extensive documentation

### External Interfacing

- Interfacing with SUMO, MATLAB and WireShark

### Integrated Debugging

- Write and link code to NetSim and debug using Visual Studio

### Event Trace

- Logs every event processed by NetSim's discrete event engine

### Dynamic Metrics

- Allows users to graph the values of parameter over simulation time

### Simulation Scale

- 100 Nodes
- 500 Nodes

### Target Users and Segment

- Educational (Lab use)
- Educational (Research)

### Emulator (Add on)

- Connect to real hardware running live applications
OUR JOURNEY

Our customers benefit from our 15+ years of experience in the field of network simulation.

SUPPORT ECOSYSTEM

Support Portal  Webinars  Videos  File Exchange  Knowledgebase/FAQ  GitHub Repo
SELECT LIST OF EDUCATION CUSTOMERS

Education - India

AC College of Technology, Karaikudi
Agra Engg. College, Agra
Aligarh Muslim University, Aligarh
Anna University College of Engg., Chennai
Army Institute of Technology, Pune
Assam University, Silchar
AU College of Engg. Vizag
B.C.Roy Engg. College, West Bengal
B.G.S Inst of Technology, Mandya
Basaveshvar College of Engg., Karnataka
Bhilai Institute of Technology, Chhattisgarh
BIT, Mesra, Patna Campus
BITS, Pilani, Goa Campus
BITS, Pilani, Hyderabad Campus
BITS, Pilani, Pilani Campus
BVCOEP, Pune
Central Institute of Technology, Kokrajhar
CIT, Coimbatore
College of Engg. and Tech, Bhubaneswar
College of Engg., Pune
DAIICT, Ahmedabad
Delhi Technical University (Formerly, DCE)
Dibrugarh University, Assam
Dr. D.Y Patil Inst of Engg. and Tech, Pune
FGIET, Bareilly
GNDEC, Ludhiana
Gokaraju Rangaraju Inst of Engg. Hyderabad
Govt Engineering College of Technology, Coimbatore
Govt Engineering College, Farmagudi, Goa
Govt Engineering College, Idukki, Kerala Govt Engineering College, Kannur, Kerala
Govt Engineering College, Raipur
Guru Nanak Dev University, Amritsar
Gwalior Engg. College, Gwalior
Haldia Institute of Technology, Kolkata
IFITM University, Moradabad
IGIT, Dhenkanal, Orissa
IIEST, Shibpur

Education - International

UniSA, Australia
Federation University, Australia
KUET, Bangladesh
Alberta University, Canada
Fleming College, Canada
University of Nottingam Ningbo, China
BITS Pilani, Dubai
Military Technical College, Egypt
LAAS-CNRS, France
Ingolstadt University, Germany
Education University of HK, Hong Kong
Al Nahrian University, Iraq
University of Udine, Italy
FREA, Japan
GIST, Korea
Transport & Telecom. Inst, Latvia
Holy Spirit University, Lebanon
Klaipeda University, Lithuania
Asia Pacific University, Malaysia

INTI, Malaysia
UTHM, Malaysia
University Teknology Malaysia, Malaysia
University Technology Petronas, Malaysia
Oslo and Akerhurs University, Norway
Sohar University, Oman
Bayamon Central University, Puerto Rico
Szczesn University of Tech, Poland
Dar Al Hekma College, Saudi Arabia
Taif University, Saudi Arabia
NUS, Singapore
SIT, Singapore
North West University, South Africa
UKZN, South Africa
UCLM, Spain
University of Vigo, Spain
Allepoo University, Syria
National Taiwan University, Taiwan
Sabanci University, Turkey

NIT, Durgapur
NIT, Jalandhar
NIT, Kurukshetra
NIT, Manipur
NIT, Meghalaya
NIT, Nagaland
NIT, Nagpur
NIT, Rourkela
NIT, Sikkim
NIT, Silchar
NIT, Surat
NIT, Suratkal
NIT, Trichy
NIT, Yupia
Pondicherry Engg. College, Puducherry
Pondicherry University, Puducherry
PSG College of Technology, Coimbatore
Punjab College of Engineering, Chandigarh
RGPV, Bhopal
R.V. College of Engg., Bangalore
Sant Longowal Inst of Technology, Punjab
Sastra University, Thanjavur, TN
Shivaji University, Kolhapur
Sinhagad College of Engineering, Pune
SMVDU, Katra
SPIT, Mumbai
Tech Teacher Training Institute, Chennai
Thanthai Periyar Govt Inst of Tech, TN
Thapar University, Patiala
TIT, Tripura
UIET, Chandigarh
VES Institute of Technology Mumbai
VIT, Andhra Pradesh
VIT Chennai
VIT, Vellore
VJTI, Mumbai
VNR VJET, Hyderabad
Walchand College of Engineering, Sangli

Core Inti Inst. Higher Edu, UAE
Cranfield University-Defence Academy, UK
De Montfort Univ, UK
Kent University, UK
Leeds Beckett Univ, UK
Salford University, UK
Sheffield University, UK
Staffordshire University, UK
University of Wales, UK
Barry University, USA
Florida Gulf Coast University, USA
Michigan University, USA
Ontarget Enterprises, USA
Pearson Education, USA
Sonoma State University, USA
Spelman College, USA
Stone Hill College, USA
University of Memphis, USA
University of Wisconsin Eau Claire, USA

12
400+ CUSTOMERS ACROSS 25+ COUNTRIES