

# iTRINEGY NETWORK EMULATOR

## INE Ultra - High Speed, High Volume Network Emulation for Large Scale Testing

iTrinegy Network Emulator - Ultra (INE-Ultra) is a Next Generation network emulator that replicates high speed, high volume networks for large scale testing.

INE Ultra is the latest addition to the iTrinegy range of network emulators that enable you to realistically recreate a wide variety of network conditions like latency, jitter, packet loss/error/reordering and bandwidth restrictions so that you can simulate environments such as Wide Area Networks (WANs), Wireless LANs, GPRS, 3G, Satellite or MPLS networks. It is then possible to test the performance of new (or existing) applications in these replicated networks.

Using these products from development, through testing to pre-deployment ensures your application will work and perform in its target network without the requirement for painful and expensive fixing, re-coding or re-designing.

### INE Ultra Features include:

- Sophisticated, but easy to use drag-and-drop GUI for Network Modelling and set-up.
- Sophisticated multi-platform command line (useful for automated testing)
- Every user /device and/or application can have an individual experience
- Sophisticated Internal Routing provides support for many different forms of QoS

- Control of link speed, bandwidth, delay (latency), errors and loss by class.

### Scalability

Utilising an industry standard Sun x64 Server, INE Ultra can handle upwards of 1.4 million packets per second and up to 50,000 individual streams or unique end points (e.g users or network devices) per emulation, with performance of up to 10 gigabits per second. This makes it ideal for the testing of **converged networks carrying data, VoIP and Video streams.**

### New Network Modelling GUI

INE Ultra has a new simple, yet sophisticated drag-and-drop multi-



platform GUI, where users can configure and control the emulator through a rich pallet of objects such as buildings, people, computers, routers etc which will build the scenario needed with the added ability to connect these objects by lines representing the network paths.

### Multi-Platform Command Line

The INE Ultra can be controlled using a multi-platform command line based application. As a result, it is well suited for use in **automated testing** situations.

### Auto-Classification

INE Ultra's new rule system can automatically control network conditions for multiple and/or individual IP streams, TCP/UDP ports or network interfaces, without laborious manual setup. This new approach eliminates the need to manually create specific rules for each stream, typically encountered with other network emulator products and which does not lend itself to large scale testing.

As an example, INE Ultra can generate a rule to allocate a maximum bandwidth of 100 megabits per second to all http traffic on Port 80 or it could create multiple filters such that each separate http connection was limited to 100k bps.

INE Ultra gives you precise control over bandwidth conditions for each end user or device e.g. game console, set-top box, IP Phone, application etc, within the test environment.

### Real-Time Adjustments

INE Ultra enables you to make adjustments to the network parameters in the middle of a running emulation reflecting the changes in network conditions over time that are typically encountered when an application travels over the production network.

### Sophisticated Internal Routing

INE Ultra handles sophisticated internal routing and switching of packets based on TCP/UDP ports, IP addresses, protocols, Ethernet protocols, etc. This enables the emulation of MPLS/QoS based networks.

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## What parameters are user configurable?

To reflect real-world conditions the uplink and downlink parameters can be configured independently. These parameters include:

**Link Speed (Bandwidth):** Sets the maximum speed (as bits per second) that the VI will support.

**Bandwidth Allocation:** Allocates bandwidth to IP Address/port/protocol/QoS combinations permitting emulation of packet shaping devices.

**Delay (Latency):** Sets the time taken for the traffic to traverse the network.

**Queue Length:** Sets the size of the buffer. If data is constrained by the emulation so that it cannot pass through quickly enough, packets will be dropped once the queue is full (as they would in the real world).

**Loss:** The selected percentage and actual number of packets that will be dropped.

**Error:** The selected percentage and actual number of packets that will be errored.

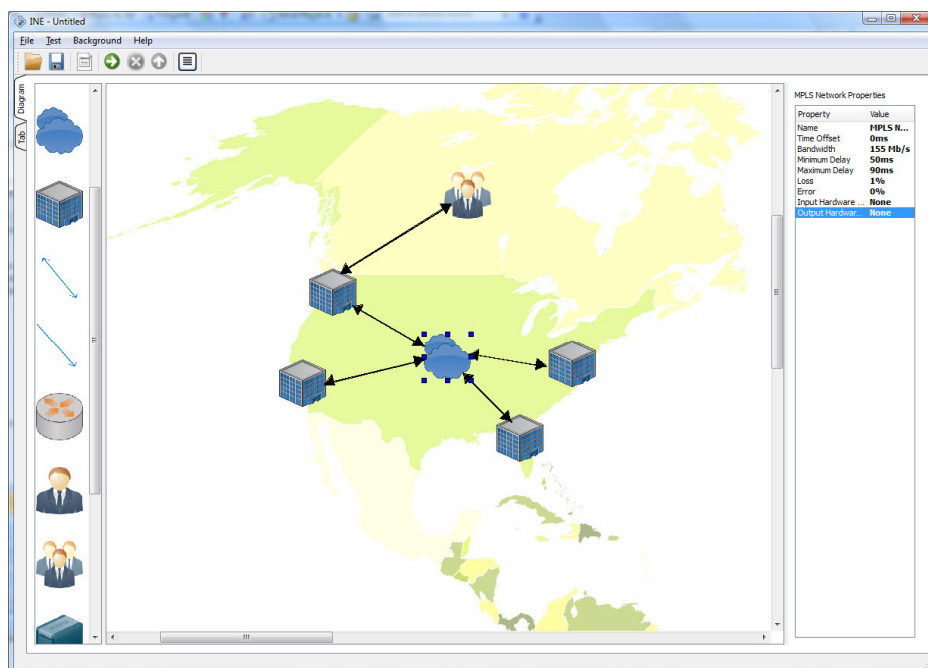
**Packets sent in order:** Packets can be transported in the same order they were sent or the order can be jumbled.

**Quality:** Selected traffic can be prioritised for preferential delivery

## What types of network can be created?

A variety of networks can be emulated, such as:

- High latency WANs (national, international and satellite)
- Wireless networks (3G, WiFi, WiMAX)
- Jittery networks, such as cause VoIP deployments a problem



The new drag & drop GUI makes setting up a replicated network easy

- Networks that lose/damage traffic
  - QoS-based networks (i.e. MPLS)
  - Routed networks
- multi-path, multi-user network emulator.

**INE Companion** - For network analysis capabilities, packet generation, capture, decoding and replay.

## The iTrinegy Network Emulator Product Range

INE Ultra is part of iTrinegy's comprehensive range of INE network emulator products designed to suit the needs of Application Developers, QA and Test Specialists, Network Professionals, IT Purchasers, Sales, Pre-Sales and field-based personnel.

The range includes:

**INE for Windows** - Network Emulation software for installation on to your Windows desktop.

**INE Compact** - The small, silent desktop network simulator

**INE LCD**—A small, genuinely portable (8ins x 9ins x 2ins / 200mm x 240mm x 50mm), all-in-one network emulator which can be used on the go.

**INE Enterprise** - A high-end, multi-site,



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