

# Paradial

## Paradial Advanced Network Emulator - PANE©

### Automated and efficient testing of IP-based audio and video communication solutions across different firewalls and NATs.

Firewalls, NATs, web proxies and switches are known to pose serious challenges to anyone deploying VoIP, Unified Communication and videoconferencing solutions. Users expect services with high reliability, excellent quality of service (QoS) and security. Solutions that fail due to changing and unknown network topologies are at a clear disadvantage in the market place.

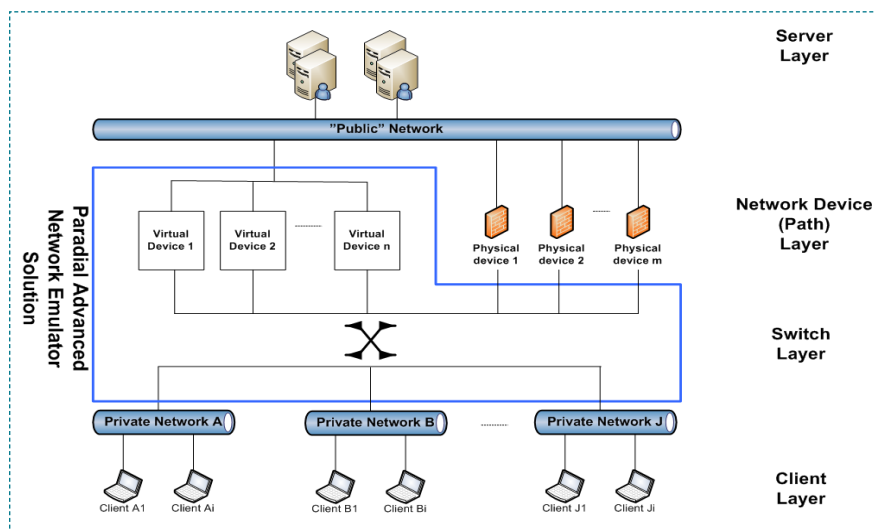
Understanding the impact of firewalls and NATs is the necessary first step when analyzing, planning and addressing network traversal challenges.

PANE has been developed to help organizations efficiently test and verify solutions in different network environments. Traffic between two communicating entities (client-server, server-server or client-client) can instantly be routed across different paths. A path in PANE contains a network device. Delay and other network artifacts, such as packet loss, reordering, and duplicates, are configurable per path. A multitude of paths can be configured in one PANE installation.

PANE consists of a set of predefined paths that emulates different NAT and firewall types, including symmetric, port restricted, and UDP-blocked. Other emulators can be configured. In addition, PANE paths can utilize network devices from different firewall and NAT vendors.

PANE's clients can be any application running on any operating system connected to PANE through an IP network.

The figure below illustrates PANE's architecture and how traffic is routed across different paths.



### Key Benefits

- Validate a product's operation when placed behind different firewall types.
- Test different firewall types, or combinations of such, in order to validate client behavior
- Test a product's capabilities to adapt to sudden or unexpected network changes
- Functional and (media) quality testing when subject to network issues, such as packet loss, delay, or reordering
- Reproduce error scenarios in a controlled environment
- Automate regression testing across all known relevant network topologies

## How it works

PANE is installed on a server with multiple physical or virtual network interfaces. The server acts as a network gateway providing access to network resources, irrespective of the protocols or operating systems the user use.

PANE provides a per-client configurable network emulation and firewall selection mechanism and is controlled by a command line tool. The tool is used to independently configure:

1. Firewall/NAT type, and
2. Network behavior, such as delay, jitter, packet loss, etc.

Each client can instantly change path and thereby send traffic across different firewall and NAT types. Each PANE client can use its own configuration which is independent of other clients in a system. Client nodes use the IP address of the PANE gateway as its default route. PANE directs and controls the flow of data through the network in order to determine the appropriate path and destination for packets.

PANE supports Exception Rules allowing certain administrative traffic, such as remote desktop connections, NFS/Samba traffic, or ssh login, to pass through without interpretation or interruption.

## Use Cases

Typical use cases include:

- Validation of a product's operation when placed behind different firewall types.
- Test different firewall types, or combinations of such, in order to validate client behavior
- Test of a product's capabilities to adapt to sudden or unexpected network changes
- Functional and (media) quality testing when subject to network issues, such as packet loss, delay, or reordering
- Reproduction of error scenarios in a controlled environment
- Automated regression testing across all known relevant network topologies

## Performance

PANE is scalable and multiple instances can be deployed to simulate larger networks. Network bandwidth capabilities typically restrict throughput prior to PANE reaching capacity.

## Platform Support

PANE is available on Linux.

## Delivery

PANE is offered as a combined software and services solution.

## About RealTunnel® technologies

Paradial RealTunnel® technologies is a portfolio of solutions that empowers efficient, secure real-time IM solutions as stand-alone applications or embedded in other systems.

### RealTunnel® technologies consist of:

- RealTunnel® firewall/NAT (Network Address Translation) traversal
- RealSIP® Server
- RealSIP® Conferencing Unit (basic component for conferencing)
- RealSIP® Communicator (basic component for SIP/IM clients)
- Paradial Advanced Network Emulator - PANE©

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## About Paradial

*Paradial is a global provider of highly efficient IP telephony solutions. Our product platforms – RealTunnel® and RealSIP® – enable secure and supreme quality IP communication services through any firewall set-up.*

## Technical Specifications

### Configurable firewall behavior:

- Direct
- NAT only
- Port restricted NAT
- Symmetric NAT
- UDP blocked NAT
- HTTP proxy enforcing scenarios
- Connectivity error scenarios
- Physical firewall from any vendor
- Physical NAT from any vendor

### Configurable network behavior:

- Delay
- Jitter
- Packet loss
- Duplicate packets
- Packet reordering

## System Components

- PANE Server software

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# Paradial

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