(Open)SER and MediaProxy

Bugspray for NATs

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SIP

SIP is our enemy. SIP is our friend. SIP is here to stay.

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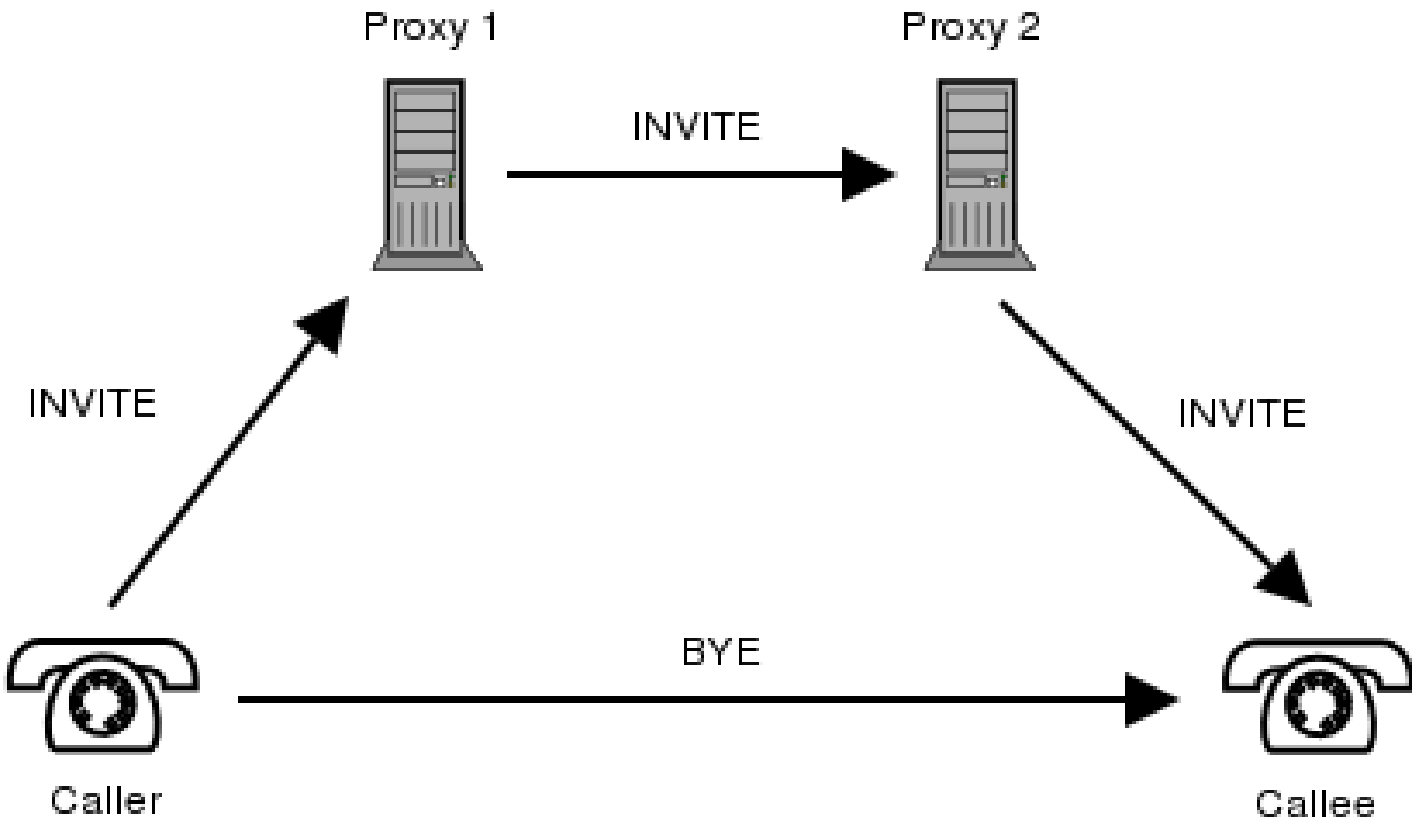
SIP Trapezoid



Sample SIP Trace

NAT

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NAT

- NAT stands for Network Address Translation
- Kinds of NAT:
  - Full Cone
  - Restricted Cone
  - Port Restricted Cone
  - Symmetric

Full Cone

A full cone NAT is one where all requests from the same internal IP address and port are mapped to the same external IP address and port. Furthermore, any external host can send a packet to the internal host, by sending a packet to the mapped external address.

Restricted Cone

A restricted cone NAT is one where all requests from the same internal IP address and port are mapped to the same external IP address and port. Unlike a full cone NAT, an external host (with IP address X) can send a packet to the internal host only if the internal host had previously sent a packet to IP address X.

Port Restricted Cone

A port restricted cone NAT is like a restricted cone NAT, but the restriction includes port numbers. Specifically, an external host can send a packet, with source IP address X and source port P, to the internal host only if the internal host had previously sent a packet to IP address X and port P.

Symmetric

A symmetric NAT is one where all requests from the same internal IP address and port, to a specific destination IP address and port, are mapped to the same external IP address and port. If the same host sends a packet with the same source address and port, but to a different destination, a different mapping is used. Furthermore, only the external host that receives a packet can send a UDP packet back to the internal host.

Firewalls

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Firewalls

Firewalls are like NATs without the benefits of IP conservation.

The “Solutions”

- STUN
- ICE
- TURN
- Smart NAT devices
- Static NAT configuration

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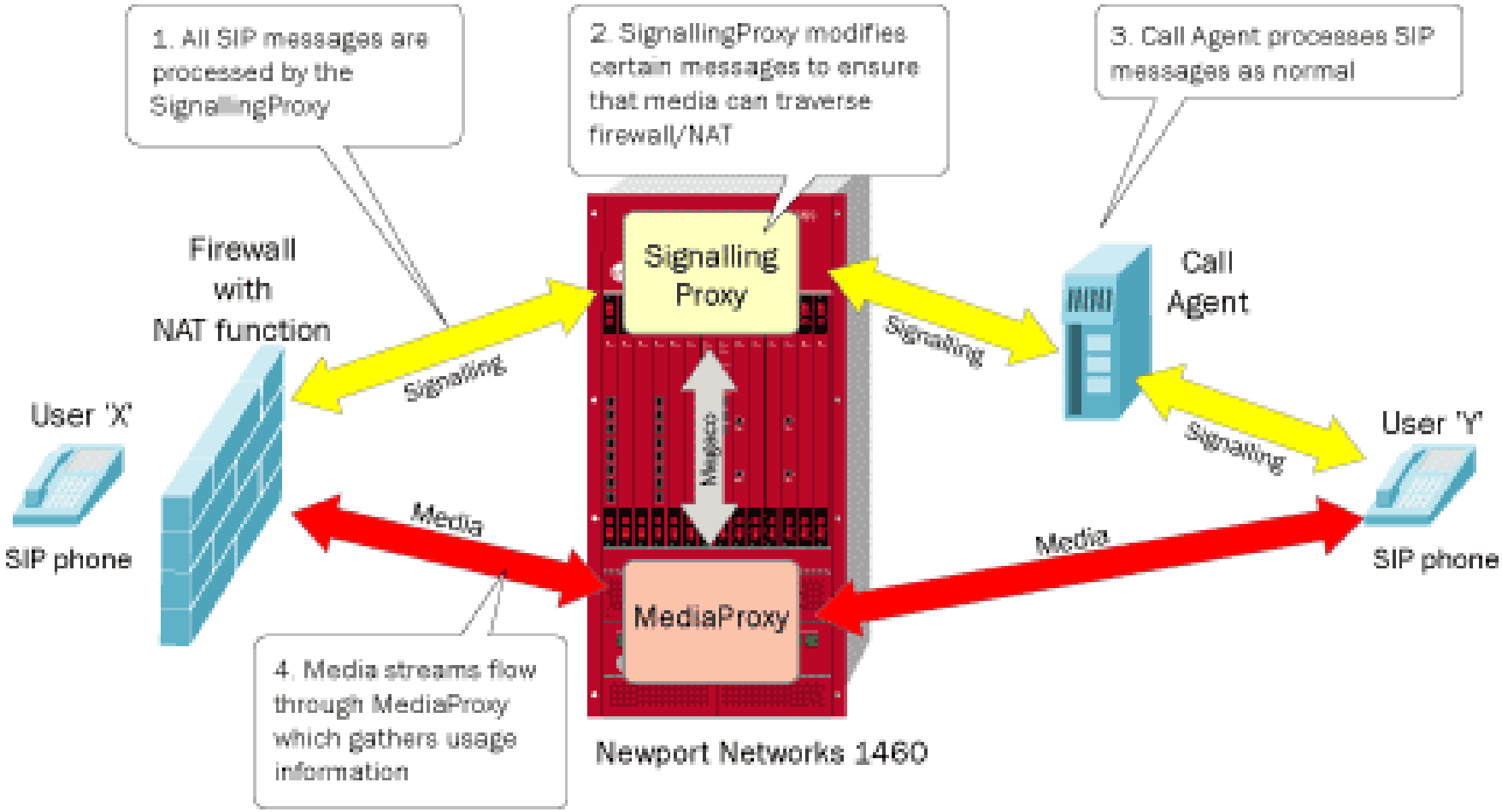
- ICE (Pipe dream)
- TURN (Pipe dream)
- Smart NAT devices (Ha!)
- Static NAT configuration (Difficult and Fragile)

Session Border Controllers



SER+MediaProxy

Hardware SBCs are expensive.
SER+MediaProxy is the open source answer.

(Open)SER

- SIP Express Router
- Asterisk Comparison
  - SIP only
  - Proxy only
  - Extreme scalability
  - Lower-level
- SER and OpenSER

Configuration

- Routing script processed for every message
- Modules
- Extensible with exec
- Example

MediaProxy

http://www.ag-projects.com/MediaProxy.html
From the README:

> *MediaProxy is a far-end NAT traversal solution for OpenSER (http://OpenSER.org) and SIP Express Router (http://iptel.org/ser) that has the following features:*
>
> - *Distributed geographical location*
> - *Scalability, load balancing and redundancy*
> - *Real-time sessions statistics*
> - *Configurable IP and UDP port range*
> - *Support for audio and video streams*
> - *Support for multiple media streams per call*
> - *Accounting of network traffic*

MediaProxy Usage

- Daemons: dispatcher and proxy
- Sample mediaproxy config
- Sample SER config

References

- Newport Networks 1460 Blurb
- Solutions for NAT Traversal in SIP Environment
- NAT Traversal Best Practices
- SIP, NAT, and Firewalls
- SIP Introduction
- SIP Trapezoid Applet