IPv6-IPv4 Translators for 3GPP

draft-elmalki-v6ops-3gpp-translator-00

Karim El Malki, Gonzalo Camarillo, Mikael Lind
Jasminko Mulahusic, Hesham Soliman

Some Background

- Draft-soininen-v6ops-3gpp-scenarios
- Draft-wiljakka-v6ops-3gpp-analysis

- Problem being tackled:
  - 3GPP SIP-based IMS applications run on IPv6
  - 3GPP hosts should be able to communicate with IPv4 SIP hosts on Internet
  - Some IPv6-IPv4 Translation mechanism is required

- Re-use solutions if possible
- Modify deployed IPv4 host base as little as possible to allow realistic deployment
- This is being discussed in 3GPP and an IETF solution would be the preferred way forward

3GPP and SIP Considerations

3GPP (3gpp-analysis/scenarios)

- Dual-stack is in general preferred: use same IP type as peer
- Not always possible in 3GPP networks
- 3GPP standards mandate IPv6 for IMS (no IPv4)
- Specific solution for 3GPP IMS, not a generic solution for any type of traffic

SIP

- SIP messages may be e2e integrity protected
- Should not do "SIP Editing" – modifying SIP messages en-route (e2e model)
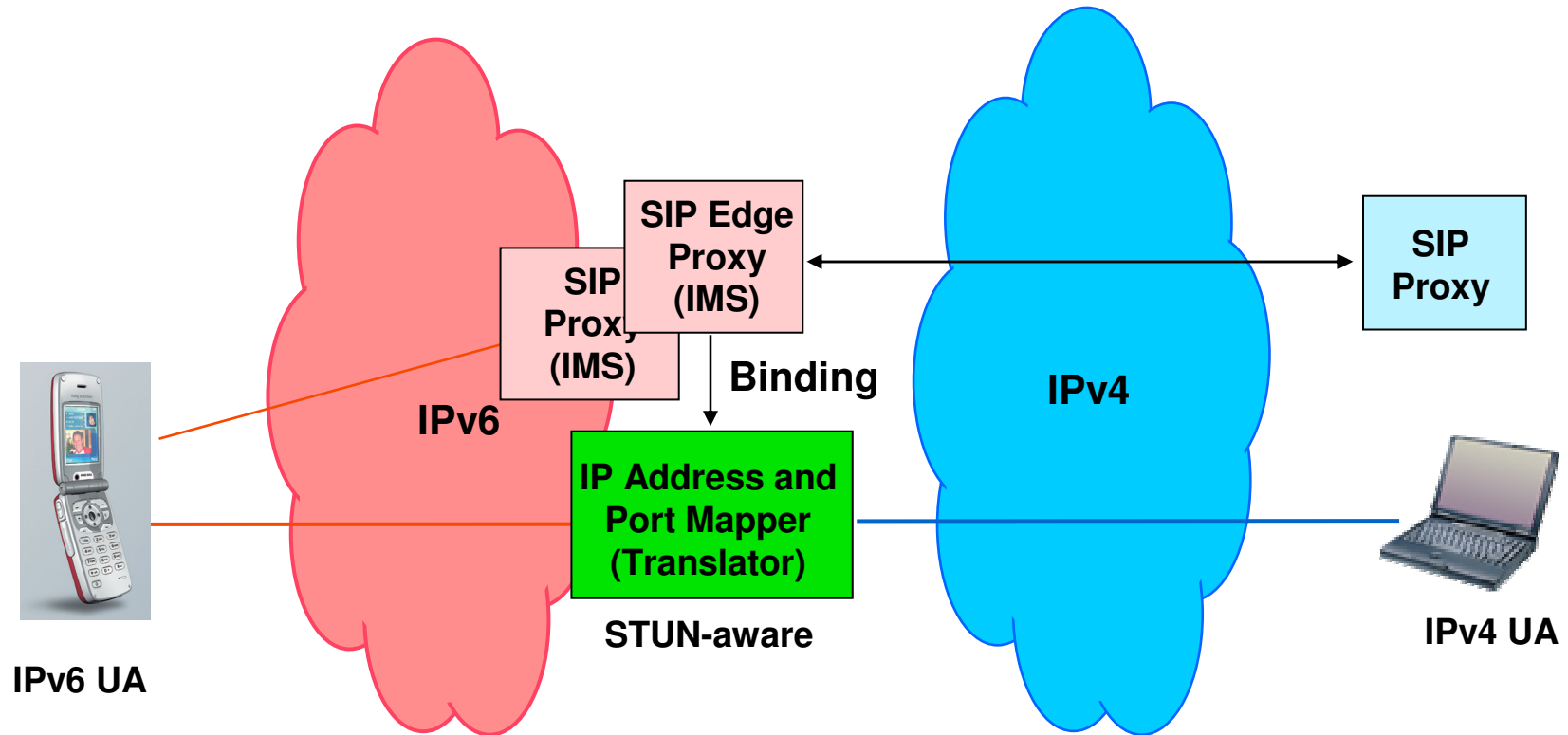- Limit changes on IPv4 installed base to facilitate deployment

Cases Considered

- ## IMS IPv6 host and public-IPv4-addressed host
  - IMS IPv6 host initiates communication
  - IPv4 host initiates communications

- ## IMS IPv6 host and private-IPv4-addressed host
  - IMS IPv6 host initiates communication
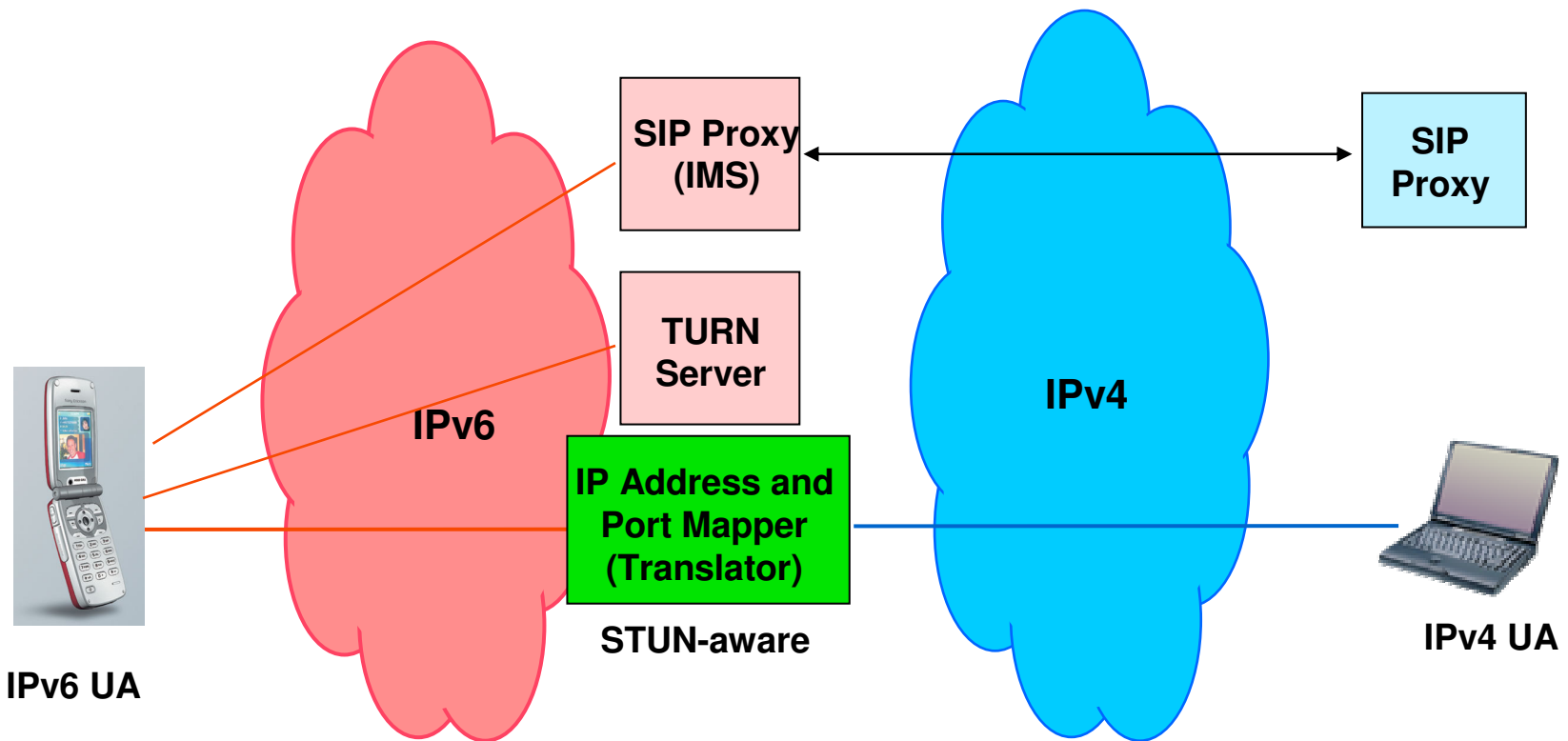 - IPv4 host initiates communications

Breaking up the Problem

- Both the 3GPP host and the IPv4 host must be reachable on a public IPv4 address/port for media

- When the IPv4 host is behind a NATv4
    - Use an end-to-end mechanism to allow the v4 host to discover it's IPv4 public address/port
    - ICE/STUN: draft-rosenberg-sipping-ice-01 (STUN RFC3489)

- Allocating a public v4 address/port to the 3GPP host for the session
    - Allow the SIP Proxy to provide this as a "hint" to the 3GPP SIP UA Embed this information in SIP
        - SIP Edge proxy can pick different translator boxes (load share)
        - Requires SIP/SDP extension to communicate "hint"
    - Not in current version of draft: Run a protocol different from SIP between the 3GPP host and a server to obtain this binding (e.g. TURN draft-rosenberg-midcom-turn-01)
        - TURN server discovery using DNS
    - Binding is torn down at the end of the SIP session

SIP Edge Proxy + Translator

SIP Edge Proxy (IMS)

SIP Proxy (IMS)

SIP Proxy

IPv6

IPv4

Binding

IP Address and Port Mapper (Translator)

STUN-aware

IPv6 UA

IPv4 UA

TURN server + Translator

- Potentially 1 more RTT to get binding from TURN server (the IPv6 UA understands it needs to do this by looking at the SDP offer/answer)

Issues and Way Forward

- Only a first version: missing parts to the solution

- Pick the easiest to deploy solution (need to consider 3GPP requirements, mobile terminal limitations)

- Feedback needed soon on the approach

- Is v6ops interested in this work? Should it be a WG item?