# ICMPv6 Echo Replies for Teredo Clients

*draft-denis-icmpv6-generation-for-teredo-00*

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# Teredo and ICMPv6

- Teredo, as per RFC4380, uses return routing and ICMPv6 to discover the closest Teredo relay corresponding to any given peer
- Unanswered ICMPv6 Echo Requests make connection creation fail as Teredo client assumes peer is unreachable
- ICMPv6 Echo Request/Reply is assumed to work through Internet, if a peer is reachable

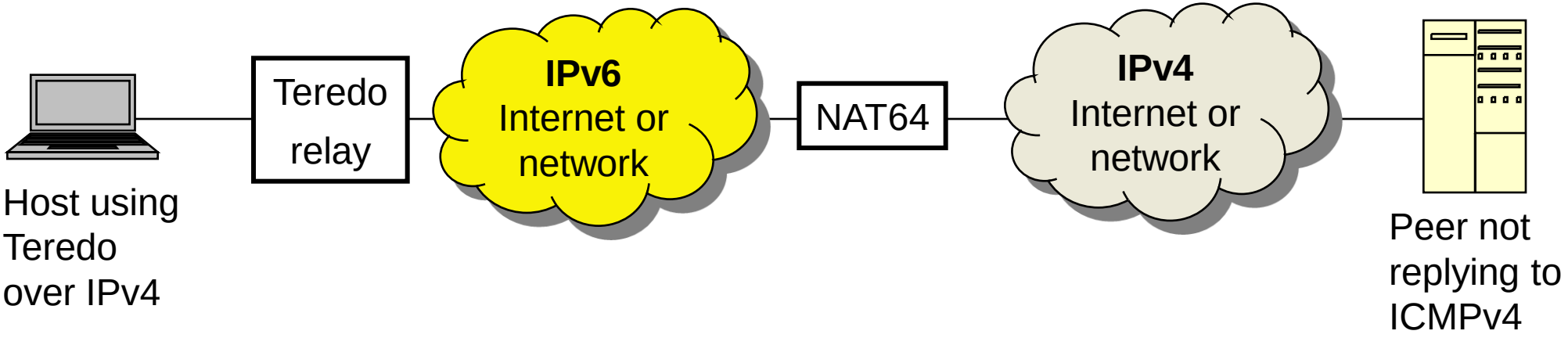
# When ICMPv6 Echo Reply may be missing

- Two scenarios are identified when ICMPv6 Echo Replies may be missing

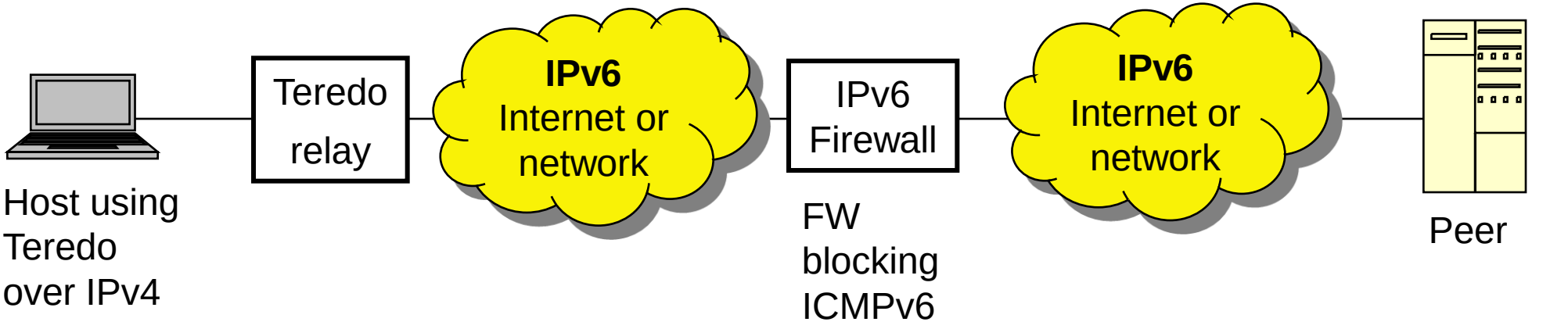
1. Protocol translation
   - ICMPv4 is routinely firewalled, even if the host (server) is otherwise reachable. It is assumed that ICMPv6 is firewalled less, especially between Teredo client and protocol translator
   - A protocol translator translates ICMPv6 into ICMPv4 – from less firewalled into more firewalled domain - and by so doing contributes to problem creation
2. IPv6 Firewall
   - IPv6 firewall may be configured to block ICMPv6 messages, thus blocking reachability tests and making Teredo client assume peer is unreachable
     - This can be the case even if IPv6 firewall would let UDP/TCP through

# Illustration of related network setups

1. Protocol translator translating between two domains:




2. IPv6 firewall blocking ICMPv6:



# Possible remedies

- Host address selection rule:
  - If destination has both A and AAAA records (and especially if AAAA is synthesized!), prefer (private) IPv4 source addresses over Teredo
- Host Teredo implementation change:
  - Modify Teredo host to continue connecting even in case of missing ICMPv6 Echo Reply – but a new route discovery mechanism would be needed
- Middlebox change:
  1. Protocol Translator: **Generate ICMPv6 Echo Replies** if it is detected that ICMPv6 Echo Replies are not received for Teredo-originated (2001:0000::/32) ICMPv6 Echo Requests
  2. IPv6 firewall: **Generate ICMPv6 Echo Replies** for Teredo originated requests, if by policy firewall would allow other (TCP/UDP) traffic flow trough, or simply **let ICMPv6 pass**
     - Note! Assuming middlebox is on the reverse path as well

# Questions

- Are the made assumptions valid?
- Is the problem real (even if corner-case)?
- Should there be a fix specified?
- How to proceed with I-D (Informational, PS, include in NAT64 work, in behave WG, individual submission)?