NAT Traversal

• How to get connectivity through Network Address Translators (NATs) — and other middle boxes

• IETF protocol for NAT traversal: ICE (RFC 5245)
  • Using STUN & TURN protocols
  • ICE WG: updated version of ICE
ICE Background

- Originally for SIP/SDP and UDP
  - Later extended to TCP (RFC 6544), suggesting many relaying (TURN, SOCKS, SSH, etc.) and NAT assisted solutions
  - Used by XMPP, RTSP, HIP, RELOAD, OCF, etc.
  - Main use today: WebRTC
  - Also multi home & dual stack address selection mechanism
  - ICE-bis: split SIP/SDP away from base mechanism
  - And various fixes; keeping backwards compatibility
ICE Basics

• Gather candidates (IP address & port candidates where the agent/endpoint might be reachable)
  • Host, server reflexive, relayed, etc.
  • Using STUN & TURN servers in Internet
• Exchange candidates (out of band signalling)
• Connectivity checks of candidate pairs
  • Try everything (no assumptions). Prioritised pair order.
Thin ICE

• How can we do ICE on constrained (class 1) devices?

• Re-using CoAP, Resource Directory, pub/sub broker, CBOR, and other infra we have
  • RD instead of STUN server
  • pub/sub broker as rendezvous layer
  • CBOR for encoding candidate pairs