ICE AND WEBRTC

draft-thomson-mmusic-ice-webrtc-01
ICE makes the following assumptions:

- that consent cannot be revoked
- that there is only one ICE agent operating
- that the signaling is created by an entity that is acting in good faith

- Only the first is being addressed
Browsers allow for concurrent ICE agents
  - In the same tab/origin to accomplish varied tasks
  - Cross tab/origin

Agents may be unaware of each other, even in the same tab

Multiple ICE agents competing cause
  - Increased check volume
  - NAT bindings might be dropped (*research continuing)
Bad signaling opens up interesting possibilities

- e.g., A large ufrag can inflate the size of a check significantly
- e.g., Adding bogus candidates can increase the number of checks

In WebRTC we have to assume that the signaling is bad

- We can’t allow applications to cause browser to misbehave
- Warning! Using ICE doesn’t require user consent or action

BAD SIGNALING
Quick calculations
- 100 candidate pair limit
- x A check every 20ms
- x 384 (or 404) byte checks
- x number of ICE agents
- = A lot of packets (my current record is almost 3Mbps)

That’s assuming constant pacing; actual numbers can be higher

WHAT COULD POSSIBLY GO WRONG?
- Cap bandwidth, globally
- Calculations in the draft
- Attempt to define “legitimate use” for 1 Agent
  - “legitimate use” might be 64kbps
  - Suggested cap: 96kbps

OPTION 1: OOPS, HACK
OPTION 2: HARD WORK

- Define global pacing for all ICE agents
- This introduces some interesting interaction problems
- RTO needs looking at (ICEbis work perhaps?)
RTO is calculated such that initial checks all go out before any retransmissions start

- Not that many implementations respect this

- Competition between agents could delay RTO in unpredictable ways if this rule is observed
  - Either way, competition is potentially bad
TRICKLE COMPATIBLE ALGORITHM

A. Normal Candidate Pairing Process + Asynchronous Trickling

Pairs

Candidate Pairs Ordered Strictly By Priority

Pacing Timer

Send Check

B. if available

RTO Timer

C. On RTO

Candidate Pairs Awaiting Checks

Checks

Checks

Send Check

B’. if no checks outstanding
Concurrent ICE agents compete

Need to ensure that one tab/origin can’t starve others out

May want to hide activity from other origins
  - Definitely want to hide connectivity check status, but relying on the ufrag/password being different should suffice