

ICE Open Issues

Justin Uberti

Open Issues

- How does the candidate pool work?
- How does ICE restart work, and how does this affect the various ICE states?
- How does ICE restart affect existing sessions?

Candidate Pool

- **New constraint for PeerConnection**

- Specifies number of candidate sets to pre-gather
- Gathers for all configured RTCIceServers; candidates are kept alive as long as the PeerConnection exists
- # = expected m= lines * 2 (for RTP + RTCP)

ex:

```
var config = <blah>;  
var constraints = { optional: [ { IceCandidatePool: 4 } ] };  
var pc = new RTCPeerConnection(config, constraints);
```

Candidate Pool, continued

- **Optimizes the candidate gathering time**
 - Specifically, after the first setLocalDescription, .oncandidate gets called with candidates faster (from the pool, until exhausted)
 - Any unused candidates from the pool are discarded; otherwise, no way to free them
- **No other changes to API flows**
 - createOffer/Answer still return SessionDescription with no candidates, initially

When is ICE Done?

- When using regular nomination, easy:
 - Controlling: sending of USE-CANDIDATE attribute
 - Controlled: receipt of USE-CANDIDATE attribute
 - But most impls won't use regular nomination
- Aggressive nomination problem is harder:
 - Controlling: when it wants to be done (similar to above)
 - Controlled: when it gets updated offer with remote-candidates
 - But updated offer won't always be sent

When is ICE Done, and do we care?

- Why do we care?
 - Controlling side may want to know when to send updated offer, with remote-candidates
 - Controlled side needs to know when to release unused candidates
 - If updated offer never comes, suggestion is to time out candidates that aren't receiving checks from the controlled side (indicating controlling side no longer is using them)

ICE Restart

- ICE Restart
 - "IceRestart" constraint to createOffer generates new credentials
 - Receipt of description with ICE credentials in offer forces generation of a corresponding new set in createAnswer
 - Actual restart (and new gathering process) triggered by setLocalDescription with a description with new ICE credentials (either offer or answer)
 - Affects all m-lines

ICE Restart Cutover

- Cutover
 - Restart is make-before-break
 - Gathering state changes back to Gathering
 - Connection state only changes if in Completed state (back to Connected)
 - Connection state then follows success of new connection
 - If connection can't be reestablished with new credentials, app can try again, or bail out