

ICE Mobility at IETF 96

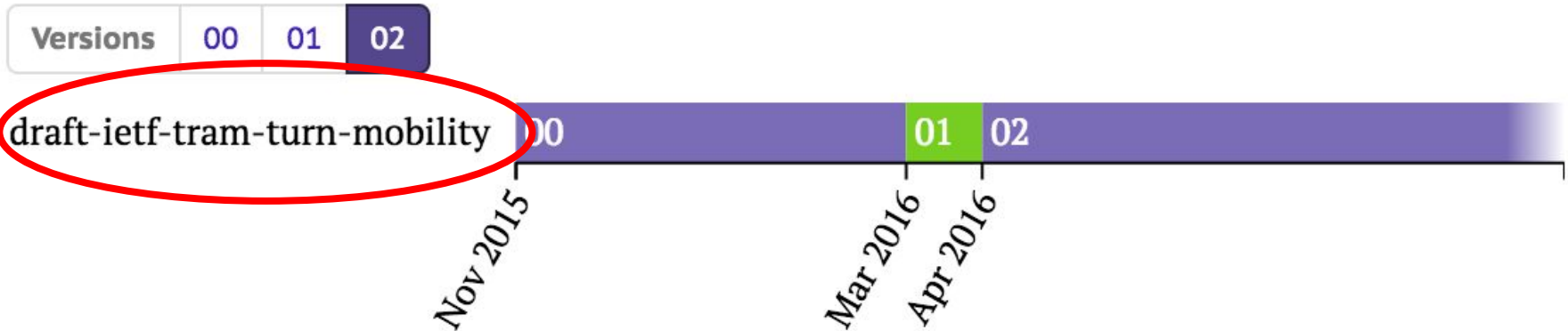
Network Cost, Renomination, and Candidate Removal

Big question

How much incremental improvement to ICE is the WG interested in standardizing?

1. Network cost
2. Renomination
3. Candidate removal
4. ???

TURN Mobility is coming



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Stream **WG state** Submitted to IESG for Publication

ICE Mobility

1. Use only TURN candidates
2. Use TURN mobility

Done!

ICE Mobility is needed (goals)

- Prefer cheaper (WiFi) over expensive (cell)
- Switch back and forth over time
- Minimize disruption when switching
- Avoid too many TURN candidates

General Choice

Option A: Improve ICE incrementally

Option B: Call ICE "done" and start over with ICENG

Option C: Both

Incremental Improvements

1. Network cost
2. Renomination
3. Candidate removal

Network Cost

Problems

- If 4 candidate pairs work, which do you select?
 - WiFi <-> WiFi
 - WiFi <-> Cell
 - Cell <-> WiFi
 - Cell <-> Cell
- If the remote side *changes* the network interface using TURN mobility, how do you know?
- If you re-select a different candidate pair, how do you know if the network interface changed? (BWE)

Solutions

- New candidate attribute signaled:
 - a=candidate network-id=X network-cost=Y
- New candidate STUN attribute
 - COST = network-id, network-cost
 - 2 uint16s

Why not candidate priority?

- Forces change in check order
 - We want to be able to order by priority and select by cost
- Can't change (without ICE restart)
- Network cost wants to be more important than all the other things with candidate priority
- ...

Renomination

Problems

- You can only nominate once
- Backup candidate pairs not possible
- Continual (un-ending) gathering not possible
- Timing of nomination tricky with passive-aggressive
 - Too soon, stuck with worse pair
 - Too late, no convergence for a while

Solutions

- New ICE option
 - a=ice-options=renomination
- New STUN attribute
 - NOMINATE = X
 - On controlling side, increment X
 - On controlled side, biggest wins

Candidate Removal

Problems

- Continual (never ending) gathering piles up candidates forever
- With WiFi/cell and ipv4/v6, there are lots of TURN candidates
 - TURN mobility is a nice solution, but requires server support
 - Removing candidates can help with a client-only change

Solutions

- `PeerConnection.oncandidateremoved`
- `PeerConnection.removecandidate`

Implementation experience

We've implemented these things (mostly) and deployed them in limited form, and it seems to work well so far.

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