Trickle ICE

Incremental Provisioning of Candidates for the Interactive Connectivity Establishment (ICE) Protocol

draft-rescorla-mmusic-ice-trickle

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Why

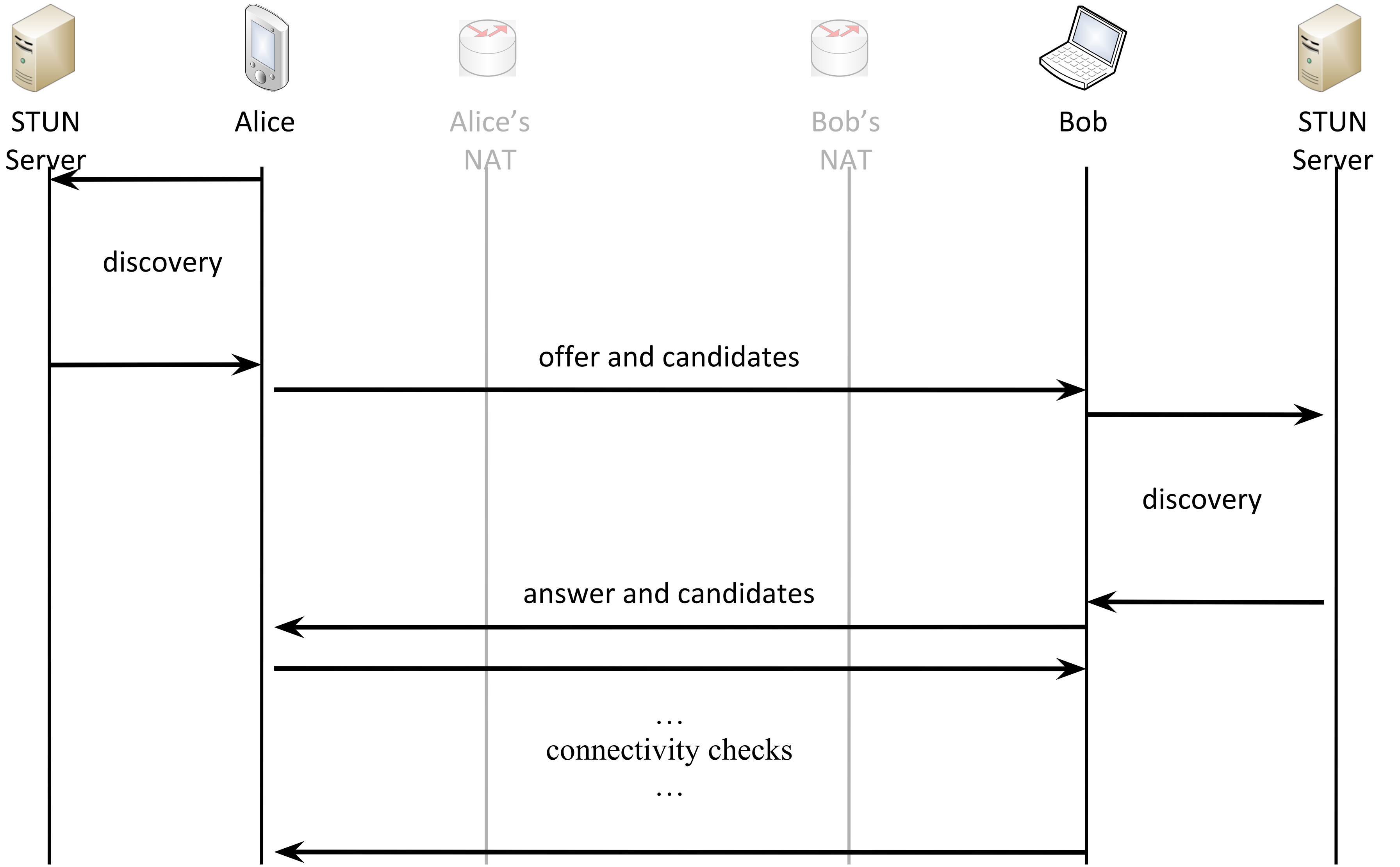
Simply stated: **makes call setup faster**

- Don't need to wait for all candidates/servers to respond
- Encourages use of multiple STUN/TURN servers
- Savings occur on both sides
- Removes need for magic timeouts

In a typical app, call setup is **improved by 500+ ms** in:

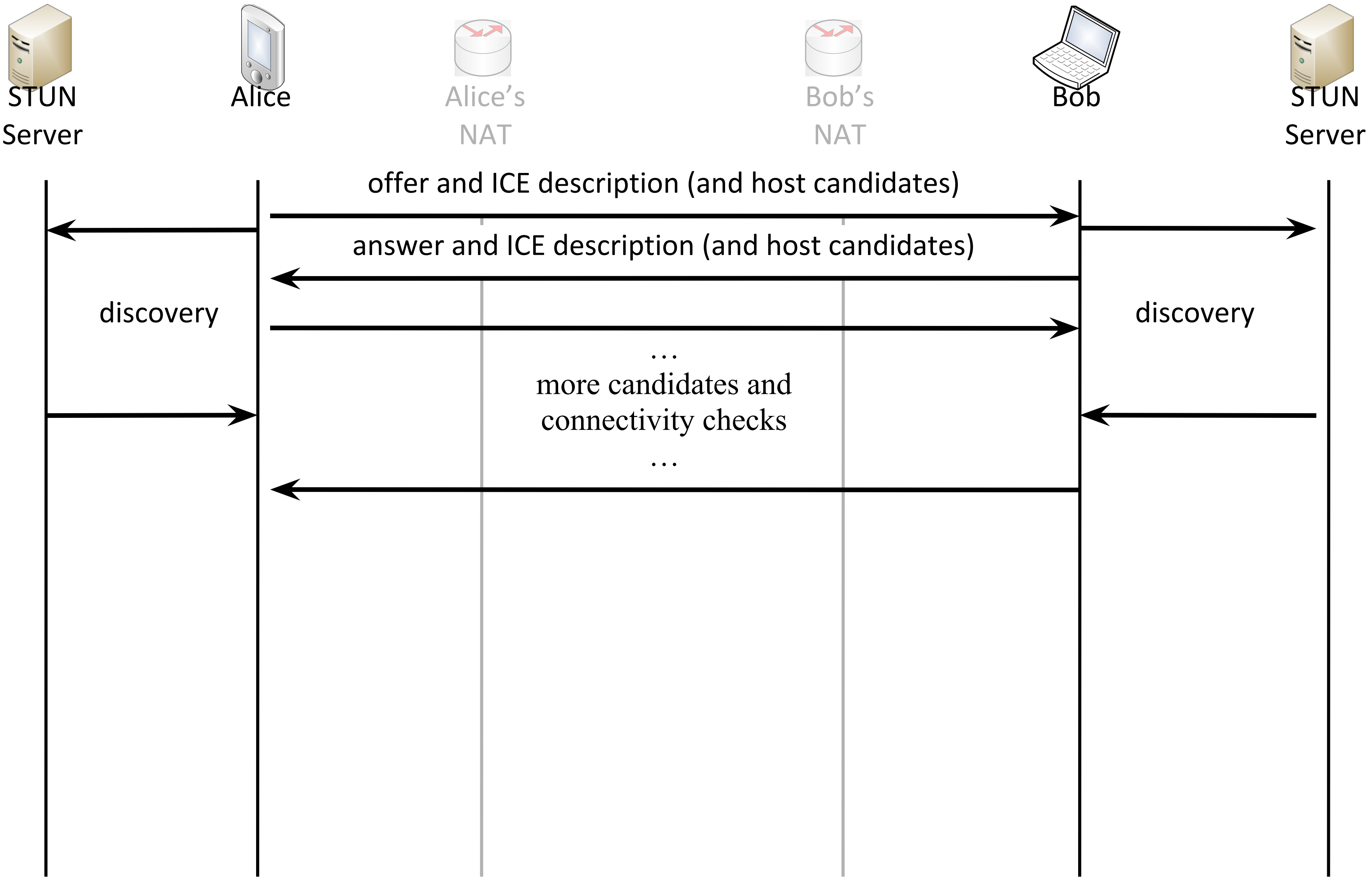
- **25%** of calls (globally)
- **50%** of calls (developing markets)
- Even more if service is not multi-region

The Problem



Vanilla ICE Operation as per RFC 5245

The Solution
send candidates as you get them



Trickle ICE

Current state

- Trickle ICE is already implemented in existing signaling protocols and real-world apps
  - XMPP (XEP-0176), JSEP (Chrome)
  - Google Talk, Empathy, etc

- But we need to nail down the exact interactions with RFC 5245
  - draft-rescorla-mmusic-ice-trickle does this

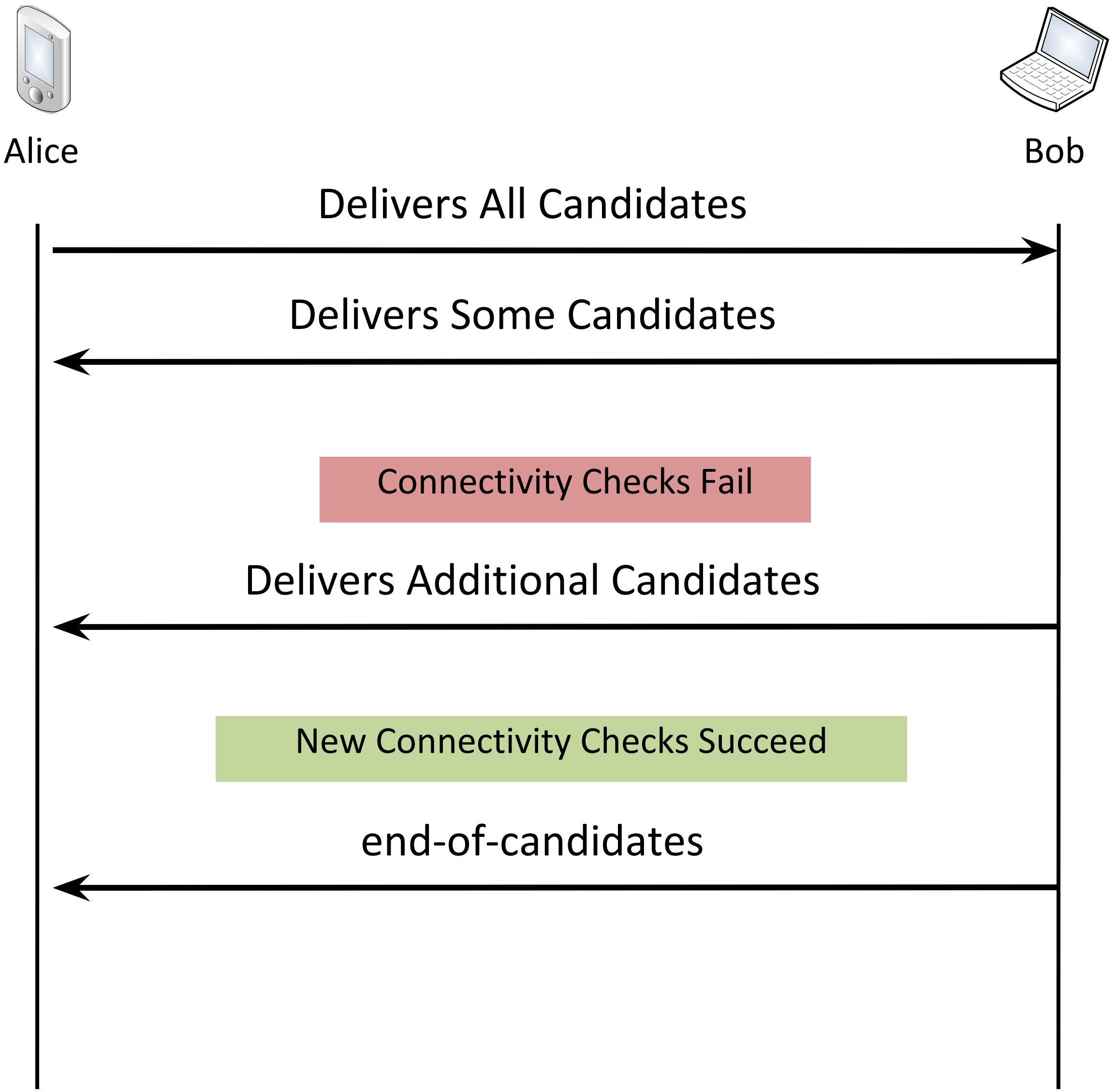
Relationship to SIP, Offer/Answer and SDP

- Extends existing ICE Offer/Answer Model
  - Defines semantics for Trickle ICE
  - ICE credentials are exchanged via offer/answer
  - More ICE candidates can be sent after credentials
- Defines SDP for negotiating Trickle ICE
  - well, not yet but in v01
- Outer signaling is left abstract
  - No SIP message for candidates defined by this spec

Details for Trickle ICE (what's currently in the spec)

- How to act upon learning additional candidates
- How to indicate that all candidates have been gathered
- How to handle ICE check list states when trickling
- How to keep checks synchronized from both ends (since we can no longer rely on stream and pair ordering)

Why end-of-candidates is needed



Backwards Compatibility

- A non-Trickle callee can't handle a Trickle offer
- Full Trickle
  - If you know remote side supports Trickle ICE (via XMPP Disco, Cap Neg, or other out-of-band mechanism)
  - Both caller and callee can trickle
- Half Trickle
  - Caller cannot trickle, but answerer can
  - Still get half the latency savings

SDP Details (Work in Progress)

- Need SDP to indicate Trickle support
  - a=ice-options:trickle
- Need way to generate valid SDP with no candidates
  - For cases where we don't want to send host candidates for privacy reasons

    c=0.0.0.0

    m=1

    a=candidate:0.0.0.0 (<- do we need this?)