MMUSIC

Happy Eyeballs Extension for ICE

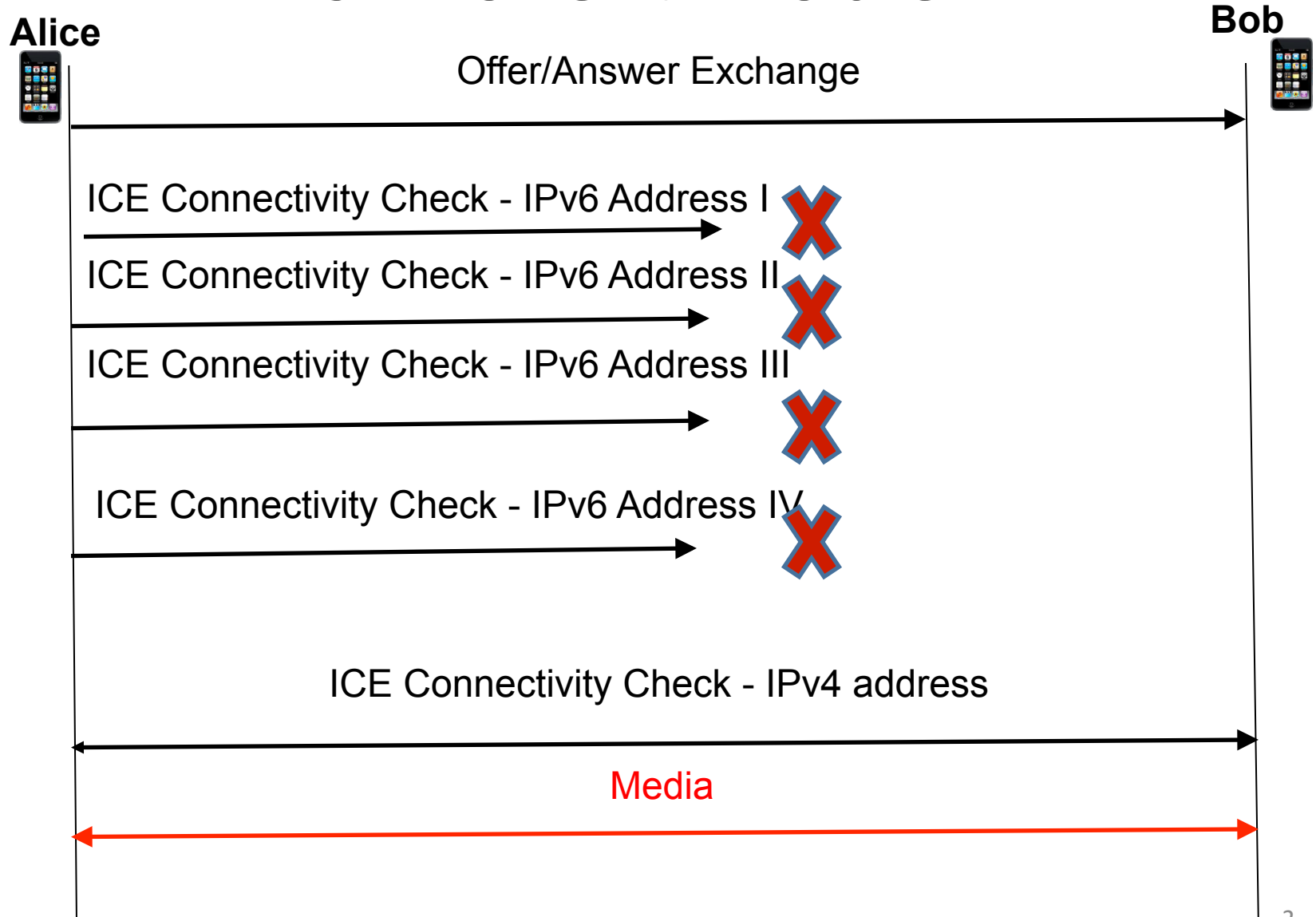**draft-reddy-mmusic-ice-happy-eyeballs-01**

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IPv6 Broken: Problem

Alice

Bob

Offer/Answer Exchange

ICE Connectivity Check - IPv6 Address I

ICE Connectivity Check - IPv6 Address II

ICE Connectivity Check - IPv6 Address III

ICE Connectivity Check - IPv6 Address IV

ICE Connectivity Check - IPv4 address

Media

Problem Statement

➢ **Several seconds to learn that IPv6 is broken!**

    ➢ Hosts with Multiple Interfaces (Wifi, 3G, VPN) could have multiple IPv6 addresses

    ➢ Host with 10 IPv6 addresses trying to reach remote peer with 10 IPv6 addresses, with Ta = 50ms

    ➢ Time before IPv4 addresses are tested would be 50ms*10*10 = 5000ms

➢ Dual stack hosts behave worse than IPv4-only hosts!

PROPOSED SOLUTION

The Happy Eyeballs ICE Solution

RFC 5245

IPv6 Host Candidate-1 Pair
IPv6 Host Candidate-2 Pair
IPv6 Host Candidate-3 Pair
IPv6 Host Candidate-4 Pair
IPv6 Host Candidate-5 Pair
IPv6 Host Candidate-6 Pair
IPv6 Host Candidate-7 Pair
IPv6 Host Candidate-8 Pair
IPv4 Host Candidate pair
IPv6 Server Reflexive Candidate Pair
IPv4 Server Reflexive Candidate Pair
IPv6 Relayed Candidate Pair
IPv4 Relayed Candidate Pair

Happy Eyeballs for ICE

IPv6 Host Candidate-1 Pair
IPv6 Host Candidate-2 Pair
IPv6 Host Candidate-3 Pair
IPv4 Host Candidate pair
IPv6 Host Candidate-4 Pair
IPv6 Host Candidate-5 Pair
IPv6 Host Candidate-6 Pair
IPv4 Server Reflexive Candidate Pair
IPv6 Host Candidate-7 Pair
IPv6 Host Candidate-8 Pair
IPv6 Server Reflexive Candidate Pair
IPv4 Relayed Candidate Pair
IPv6 Relayed Candidate Pair

The Happy Eyeballs ICE Solution

Alice

Bob

Offer/Answer
a=happy-eyeball:2

Bind Request using IPv6 Address I

Bind Request using IPv6 Address II

Bind Request using IPv4 Address

Bind Request using IPv6 Address III

Bind Response using IPv4 address

Media

The Happy Eyeballs ICE Solution

➢ New ICE option "happy-eyeballs:N"

    ➢N indicates the promotion position.

    ➢Required to handle NAT address-filtering problem.

    ➢As IPv6 becomes more prevalent, the value of 'N' can be increased as desired.

The Happy Eyeballs ICE Solution

➢ Problem avoided (Dual Stack Hosts, IPv6 broken)

  ➢ Faster response even if IPv6 path is down, host has global IPv6 address but is disconnected from the IPv6 Internet.

QUESTIONS ?