JSEP Update

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IETF 83
Topics

- Activity since IETF 82
- Implementation Status
- Issues Raised
Activity since IETF 82

- Long discussion at IETF 82.5
- Minor changes made to JSEP draft, to allow ROAP to be implemented atop JSEP
- draft-ietf-rtcweb-jsep-00 adopted as WG document; fixed several issues
Implementation Status

- Chrome API renamed for JSEP
  - old API renamed webkitDeprecatedPeerConnection
  - new API named webkitJsep00PeerConnection
- Targeting Chrome 19 as first version to support JSEP PeerConnection
  - Preliminary (working!) builds available now
  - May show up on Canary this week
- ROAP-on-JSEP JS library written by Harald Alvestrand, open-sourced, works with Chrome JSEP builds
W3C Status

- API from uberti-ietf-rtcweb-jsep-00 included by Cullen Jennings in branch of W3C WebRTC spec
- Adam Bergqvist published an alternate branched version that keeps more of the existing API
- Discussions between authors are ongoing; expecting to reach consensus
Issues Raised

● Provisional and final answers
  ○ Control of media transmission
  ○ Resource management
  ○ Multiple 2xx answers

● ICE Candidates
  ○ Associating candidates with m= lines
  ○ Release of unneeded candidates
  ○ Restarts

● What state sequences are legal?
● What SDP can application change?
Provisional Answers

- **Provisional answers (SDP_PRANSWER)**
  - Originally meaning was to allow SDP to be returned without starting media
  - Turns out in some cases, media is desired

- **Replaced by direction attribute in SDP**
  - Callee that wants to warm ICE and DTLS without starting media can send a PRANSWER with a=inactive; "final" ANSWER is sendrecv
  - PRANSWER could be sendrecv, if desired
A places a call to B

OFFER

m=audio 11111 RTP/AVPF 0
a=candidate:1 1 udp 1694498815 11.11.11.11 11111 typ host
a=sendrecv

B's browser immediately responds to get ICE warmed up, no media exchanged

PRANSWER

m=audio 22222 RTP/AVPF 0
a=candidate:1 1 udp 1694498815 22.22.22.22 22222 typ host
a=inactive

B accepts call, media flows in both directions

ANSWER

m=audio 22222 RTP/AVPF 0
a=candidate:1 1 udp 1694498815 22.22.22.22 22222 typ host
a=sendrecv
1-800-GO-FEDEX scenario

OFFER
[...]
m=audio 11111 RTP/AVPF 0
a=candidate:1 1 udp 1694498815 11.11.11.11 11111 typ host
a=sendrecv

180 with 2-way early media

PRANSWER
[...]
m=audio 22222 RTP/AVPF 0
a=candidate:1 1 udp 1694498815 22.22.22.22 22222 typ host
a=sendrecv
PRANSWER Semantics

- No implicit notion of media direction with PRANSWER
- Sole meaning is "non-final ANSWER"
- Allocated resources (e.g. codecs) are not released on PRANSWER
- Allocated resources are released on ANSWER
Multiple 2xx Answers

B

C

A

OFFER

setRemoteDescription(ANSWER)

???

ANSWER (200)

ANSWER (200)
Multiple 2xx Answers

- Since resources are released on the first ANSWER, an ANSWER cannot directly follow an ANSWER
- Client can ACK + BYE subsequent ANSWERs (i.e. first-one-wins)
- Or can treat all ANSWERs as PRANSWER, with timer to ANSWER and clean up (i.e. last-one-wins)
- No mixing occurs
interface IceCandidate {
    // the m= line index for this candidate
    readonly int mLineIndex;
    // the mid for the m= line for this candidate
    readonly DOMString mLineId;
    // creates a SDP-ized form of this candidate
    DOMString toSdp();
};

- JSEP candidates are currently identified by a string corresponding to SDP a=mid
  - optional in SDP
  - required for Jingle
- API change to allow either index or id string to be used
Release of Candidates

- JSEP allows adding candidates, separately from the offer/answer exchange, via `processIceMessage` (i.e. "trickle" candidates)
- ICE Agent determines optimal media path via RFC5245 nomination process
- "Worse" candidates are released after nomination completes
  - e.g. If STUN works, TURN candidates are released
  - local/peer-reflexive candidates kept for later use
ICE Restarts

- Calls should survive network blips
  - ISP NAT resets
  - Call "rehydration" after reload
- Existing candidates can redo connectivity checks
- Or a full re-ICE can be performed by calling startIce again
  - Requires new offer-answer to exchange new ICE credentials and candidates, but call survives
JSEP States

- Clarity requested on state changes
  - Legal state transitions shown by arrows below
  - OFFER-OFFER can occur when adding streams
JSEP Attributes

- Some attrs that the app may wish to tweak
  - remove or reorder codecs (m=)
  - change codec attributes (a=fmtp; ptime)
  - enable/disable BUNDLE (a=group)
  - enable/disable RTCP mux (a=rtcp-mux)
  - reorder SRTP crypto-suites (a=crypto)
  - change SRTP parameters or keys (a=crypto)
  - change send resolution or framerate (TBD)
  - change desired recv resolution or framerate (TBD)
  - change total bandwidth (b=)
  - remove desired AVPF mechanisms (a=rtcp-fb)
  - remove RTP header extensions (a=rtphdr-ext)
  - add/change SSRC grouping (e.g. FID, RTX, etc) (a=sssrc-group)
  - add SSRC attributes (a=ssrc)
  - change ICE ufrag/password (a=ice-ufrag/pwd)
  - change media send/recv state (a=sendonly/recvonly/inactive)
Questions