

JSEP Update

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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

PRANSWER Use Case 1

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

PRANSWER Use Case 2

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

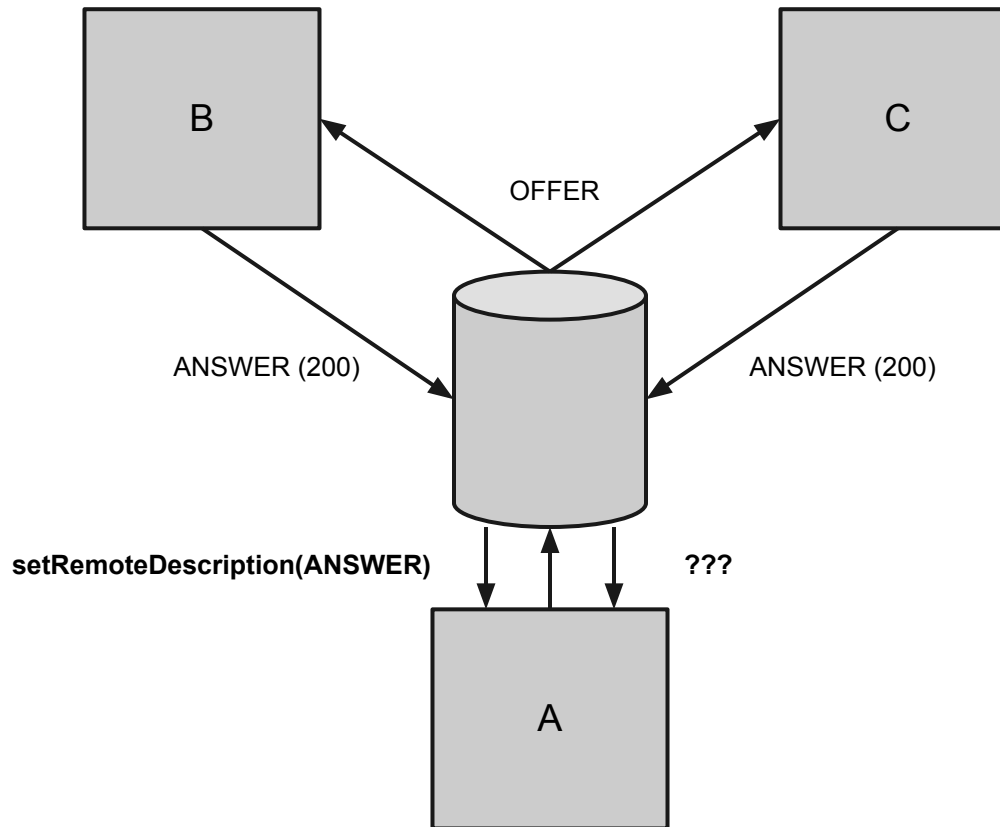
a=candidate:1 1 udp 1694498815 22.22.22.22 22222 typ host

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



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

Associating Candidates

```
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

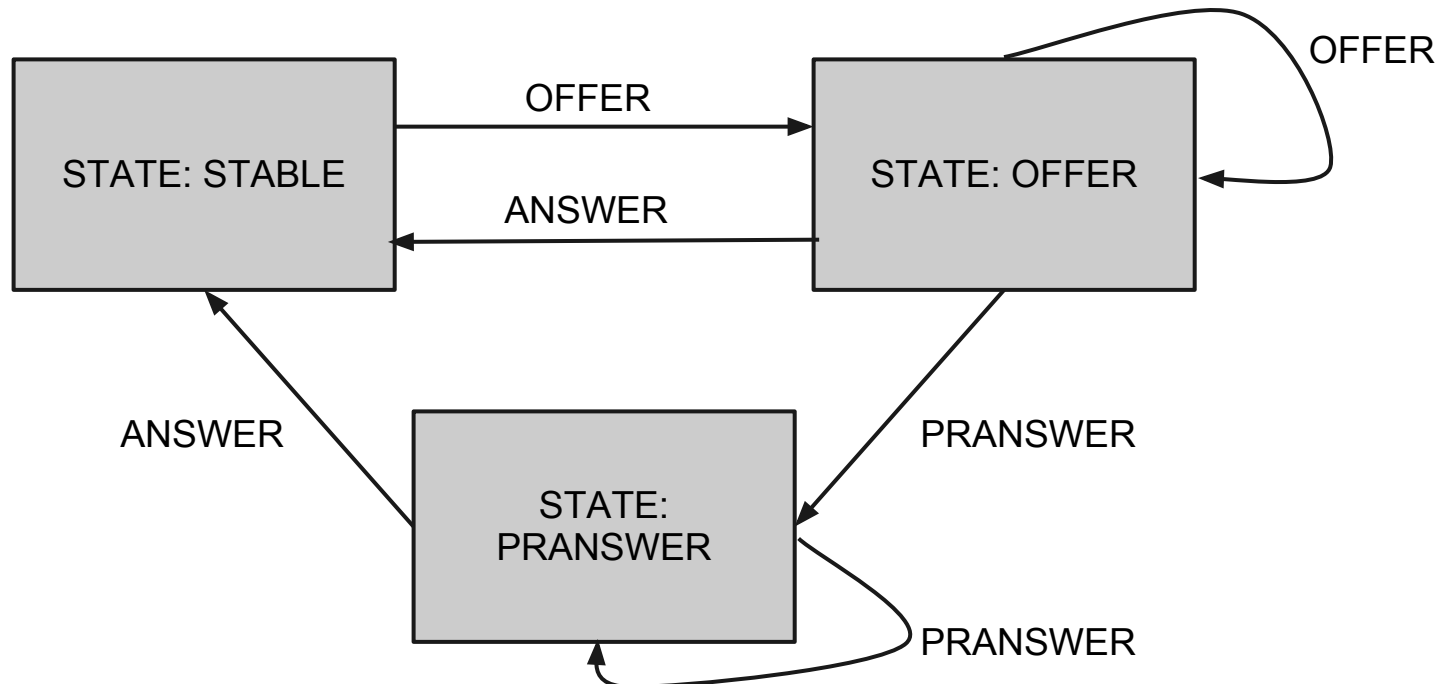
- JSEP allows adding candidates, separately from the offer/answer exchange, via processIceMessage (i.e. "trickle" candidates)
- ICE Agent determines optimal media path via RFC5245 nomination process
- "Worse" candidates are released after nomination completes
 - e.g. If STUN works, TURN candidates are 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 attribs 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=ssrc-group)
 - add SSRC attributes (a=ssrc)
 - change ICE ufrag/password (a=ice-ufrag/pwd)
 - change media send/recv state (a=sendonly/recvonly/inactive)

Questions