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IETF-51

SIP WG
Early Media Issues

draft-sen-sip-earlymedia-00.txt

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Overview

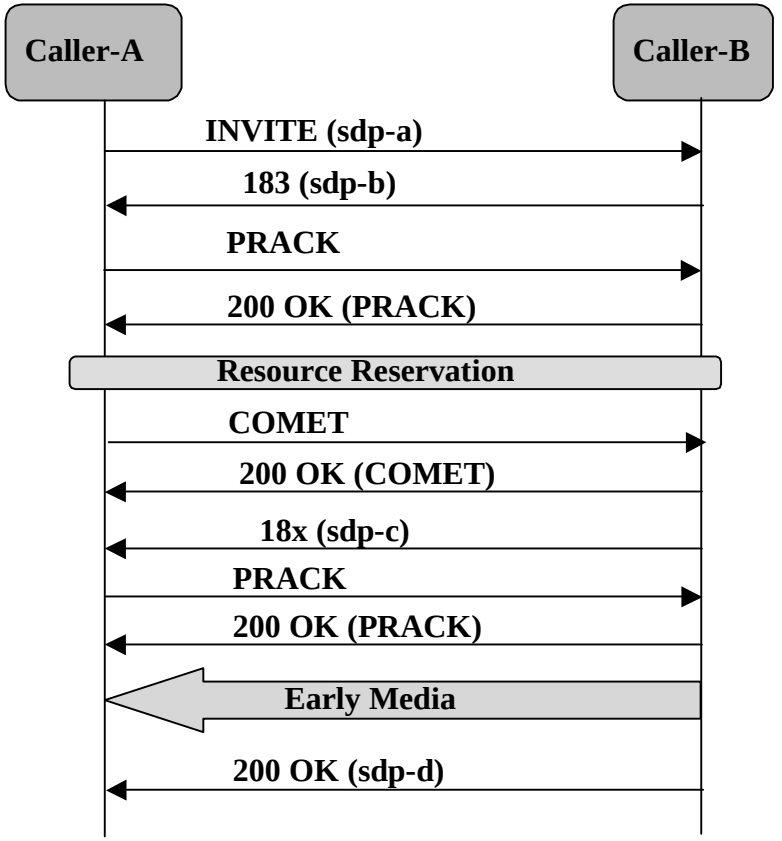
- **Early media is the concept of delivering a media stream prior to call answer or session establishment**
  - In terms of SIP this means media prior to “200 OK” being sent in response to an “INVITE” message.
- **There are two distinct reasons why Early Media is required when inter-working with the PSTN**
  - Delivers inband call progress messages when inter-working with PSTN, such as:
    - Treatments such as busy tone or reorder tone
    - Announcements (e.g. “This number has been changed to…”)
    - Ringing tone provided at far end when no subscriber free indication is available in PSTN signalling (e.g. when call terminates on a PBX)
  - Avoids clipping of the backwards voice path when a call is answered
    - This can happen because the audio media may unintentionally arrive at the originating user agent ahead of the “200 OK” response to an “INVITE”.

Assumptions

- **Assumes unidirectional early media flow from callee to caller**
- **Assumes use of extensions defined in draft-ietf-manyfolks-resources-01.txt**
- **Interworking scenarios are equally applicable to PSTN and PBX networks**
- **Uses 2543-bis-03 and focuses on the issues due to limitations of SIP and related to interworking with the PSTN/PBX networks.**

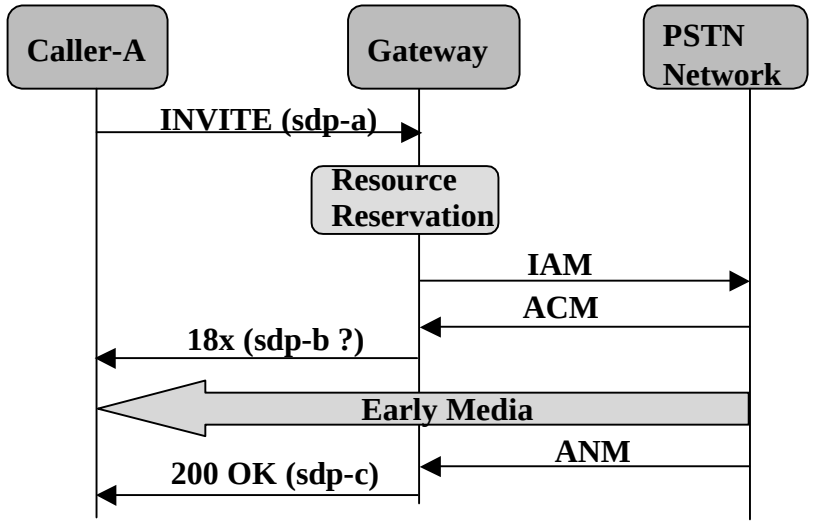
General Issues

- The SDP-c received in 18x may contain a different session description for early media than that contained in 200 OK for the actual media (SDP-d)
  [e.g., when the Early Media source is an announcement server]
- Resource reservation must re-occur if the SDP-b in 183 differs from SDP-c in 18x or SDP-d in 200 OK
- Potential security loopholes since the firewall/NAT has to establish pinholes/bindings without complete knowledge of the early media source address/port
- Misuse of SDP in 18x (SDP-c) to indicate whether early media is expected

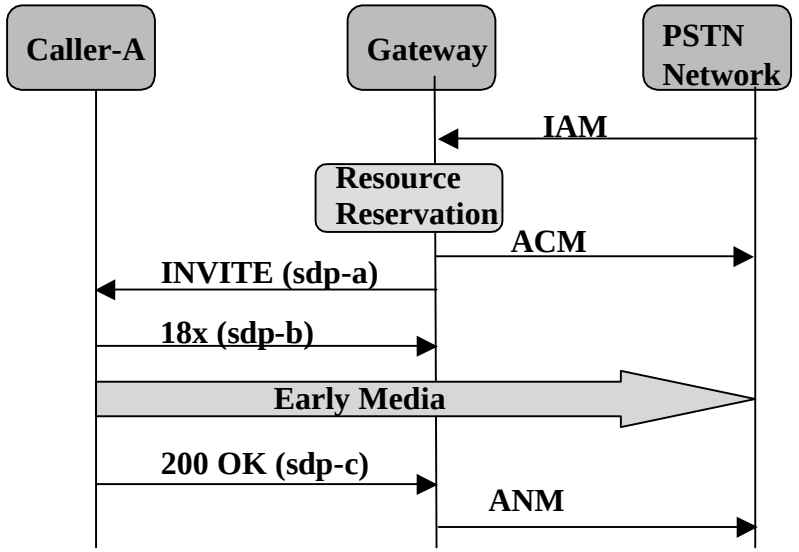


Scenarios

- **PSTN Terminating**
  - The Gateway controller is unable to determine an indication of early media from received ACM.



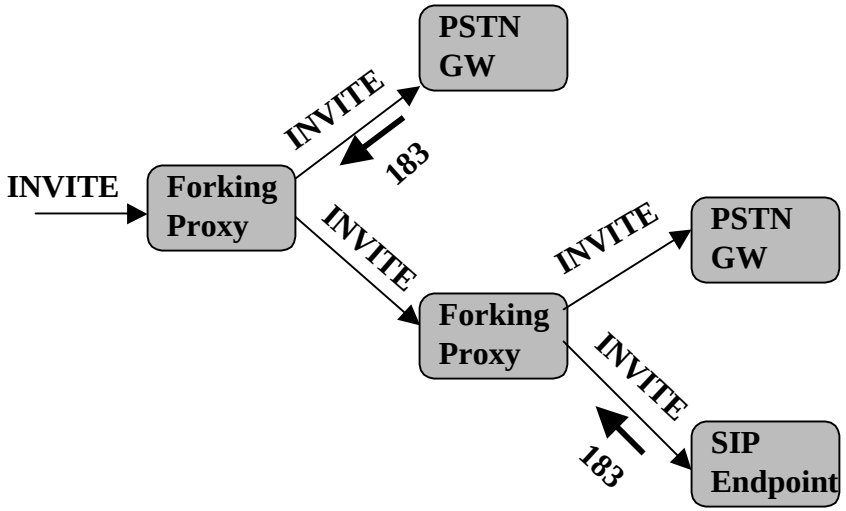
- **PSTN Originating**
  - An ACM should be sent out to the PSTN after reserving gateway resource and prior to sending INVITE to the Caller-A (i.e., without receiving any call status information from Caller-A) to avoid Early Media clipping



Forking Issues

- **Parallel Forking**
  - Decoupling of SIP session control and the media can lead to potential race conditions between multiple Early Media sessions leading to undesirable user behavior during call set-up
  - Similar consideration applies to multiple 18x's

- **Sequential Forking**
  - There may be need for sequential play-out of multiple Early Media sessions (e.g., multiple announcements)
    - Require a mechanism to trigger branch migration at the end of each early media session



Proposed Strategies

- **Non forking**
  - Make sure that resource reservation preconditions are met before Early Media exchange
  - In case, the SDP information changes in subsequent 18x or 200OK, the resource reservation must re-occur
- **Forking**
  - Parallel Forking
    - Intelligent arbitration handling at Client terminal or at the gateway on the media path
    - Adding an indication (may be through a new header) in 18x response at the proxies to indicate to the client that the original INVITE has been forked
  - Sequential Forking
    - Prioritize forked requests or responses. This priority may be set by the end-user or can be communicated to the proxy prior to session establishment

Conclusion

- No clear solutions for the issues with SDP within provisional messages and the forking problems
- Forking problem needs improved signaling between the UA and the proxy
- Giving the end user the choice of dealing with multiple received early media sessions may be the solution. Of course, this requires that the user be reconditioned from their current expectations of the behavior of the traditional PSTN/PBX calls

Comparison w/ draft-rosenberg-sip-early-media

- There is an overlap with issues defined by the early media draft (draft-sen-earlymedia-00.txt) but the solution space is very different
- It does not consider resource reservation phase
- Assumes relaxation of restriction imposed by 2543RFC for supporting re-INVITE apriori of receipt of 200ok
- Issues with SDP considerations in INVITEs, provisional responses and PRACKs are not resolved
- PSTN inter-working scenarios may need closer study since early media negotiation (using183-PRACK exchange) is assumed to be done after ACM and this may lead to Early Media clipping problem.