**Contribution**

**Title: IP Interconnect SIP profile – Early Media procedures**

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**ABSTRACT**

This contribution provides proposed text for the Early Media section of the current working draft for the IP Interconnect.

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There are numerous possible implementations for the support of early media. This can lead to inter-operability issues between provider networks when different approaches are used.

For example, the use of the 180 Ringing response to indicate that the called party is being alerting and that the originating party must now apply alerting to the user is common. Further, the exchange of SDP is also a common method to indicate that early media is being provided by the downstream node and that the originating party should through connect the media path and allow media to flow to the user. However, there can be confusion as to how to handle the case when a 180 Ringing response is received with SDP, or if one messages is received after the other – which procedure takes precedence? This is no single correct answer as the procedure may differ by network and vendor. Further, the use of SIP vs. SIP-I (or SIP-T) adds another layer of confusion.

The confusion lies in the fact that standard SIP per RFC 3261 does not provide an explicitly clear indication when early media is available or not and therefore when it is appropriate for the originator to apply alerting locally vs. when to through connect the media path, except in the most simplistic cases. To complicate the matter, standard SIP provides no indication as to when forward media is to be allowed prior to answer, (the SDP directionality attribute does not completely fulfill the requirement).

To address this concern, it is proposed that the IETF RFC 5009 procedures for the use of the SIP P-Early-Media header field be applied to the NNI IP Interconnect SIP Profile. This header field provides a clear indication as to when forward and backward media have been authorized.

When backward media is not authorized, then the originator should apply alerting once the 180 Ringing response has been received (since it is known that no backward media will be allowed from downstream). Alternatively, when backward media is authorized, it is known that this is done in order to support the flow of backward early media. In this case, the originator should through connect the media path to allow media to flow once the media path has been established.

When services are invoked that requirement the support of two-way media prior to answer, it is possible to communicate that both-way media has been authorized.

RFC 5009 procedures are also flexible enough to indicate when the media authorization is being enforced through gating of the media path. It also addresses scenarios when multiple streams have been established – each separate stream can be managed independently. While this proposal does not address these capabilities, they could be added by future contributions, as necessary.

**PROPOSED TEXT**

The following text is proposed for section 6.2 of the IP Interconnection document. Further, it is proposed to delete section 6.3 of that document.

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## Early-Media

### Terminating network procedures

When sending an 18x response and early media will be present, the response shall include a P-Early-Media header field, as defined in IETF RFC 5009, authorizing early media, except when

- a reliable provisional response including a P-Early-Media header field has already been sent, and

- the most recently sent P-Early-Media header field authorization matches that which would be sent.

When both-way early media is required, the 18x response shall include a P-Early-Media header field authorizing backward and forward early media (i.e., "sendrecv"), otherwise the P-Early-Media header field shall only authorize backward early media (i.e., "sendonly").

When early media will not be present, the 18x response shall include a P-Early-Media header field not authorizing early media (i.e., “inactive”).

In the event that the nature of early media changes after initially signaled in an 18x response, the new authorization may be signaled in the P-Early-Media header field of either a subsequent 18x response or an UPDATE request.

### Originating network procedures

When sending the initial INVITE request it shall include the P-Early-Media header field with the “supported” value to indicate applicability of the P-Early-Media procedures, per IETF RFC 5009.

When an initial or subsequent 18x response or UPDATE request is received containing a P-Early-Media header field, then the following through connection procedures shall occur.

* If a P-Early-Media header field is received authorizing backward early media (i.e., a value of "sendonly"), then through connection in the backward direction shall be performed, if not already done.
* If a P-Early-Media header field is received not authorizing early media (i.e., a value of "inactive"), then through connection shall not be performed or removed if already done. The originating network shall generate alerting once a 180 Ringing response has been received.
* If a P-Early-Media header field is received authorizing both backward and forward early media (i.e., a value of "sendrecv"), then through connection in both directions shall be performed. The bearer path shall be connected in both directions on completion of the bearer setup.

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