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## Offer/Answer Considerations for G723 Annex A and G729 Annex B

### Abstract

This document provides the offer/answer considerations for the annexa parameter of G723 and the annexb parameter of G729, G729D, and G729E when the value of the annexa or annexb parameter does not match in the Session Description Protocol (SDP) offer and answer.

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## Table of Contents

1. Introduction . . . . .	2
2. Terminology . . . . .	3
3. Offer/Answer Considerations . . . . .	3
3.1. Considerations for Use of Comfort Noise Frames . . . . .	3
3.2. Offer/Answer Considerations for G723 Annex A . . . . .	3
3.3. Offer/Answer Considerations for G729 Annex B, G729D Annex B, and G729E Annex B . . . . .	4
4. Examples . . . . .	5
4.1. Offer with G729 annexb=yes and Answer with G729 annexb=no . . . . .	5
4.2. Offer with G729 annexb=yes and Answer with G729 and No annexb Parameter . . . . .	5
4.3. Offer with G729 and No annexb Parameter and Answer with G729 annexb=no . . . . .	6
5. Security Considerations . . . . .	6
6. Acknowledgments . . . . .	7
7. Normative References . . . . .	7

## 1. Introduction

[RFC4856] describes the annexa parameter for G723 as follows:

annexa: indicates that Annex A, voice activity detection, is used or preferred. Permissible values are "yes" and "no" (without the quotes); "yes" is implied if this parameter is omitted.

Also, [RFC4856] describes the annexb parameter for G729, G729D, and G729E as follows:

annexb: indicates that Annex B, voice activity detection, is used or preferred. Permissible values are "yes" and "no" (without the quotes); "yes" is implied if this parameter is omitted.

However, a problem arises when the value of the annexa or annexb parameter does not match in the SDP [RFC4566] offer and answer.

For example, if the offer has G729 with annexb=yes and the answer has G729 with annexb=no, it can be interpreted in two different ways:

- o The offerer and answerer proceed as if G729 is negotiated with annexb=yes, or
- o The offerer and answerer proceed as if G729 is negotiated with annexb=no.

Since this is not clear in the existing specifications, various implementations have interpreted the offer/answer in their own ways, resulting in a different codec being chosen to call failure, when the parameter value does not match in the offer and answer.

[RFC3264] requires SDP extensions that define new fmtp parameters to specify their proper interpretation in offer/answer. This document specifies the proper interpretation for the annexa and annexb parameters in offer/answer.

## 2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

## 3. Offer/Answer Considerations

The general objective of the offer/answer considerations is to make sure that if the offerer or answerer indicates it does not support Annex A or Annex B, then Annex A or Annex B is not used.

### 3.1. Considerations for Use of Comfort Noise Frames

[RFC3551] states that:

Receivers MUST accept comfort noise frames if restriction of their use has not been signaled. The MIME registration for G729 in RFC 3555 specifies a parameter that MAY be used with MIME or SDP to restrict the use of comfort noise frames.

Hence, if the SDP offer or answer indicates that comfort noise is not supported, comfort noise frames MUST NOT be used.

### 3.2. Offer/Answer Considerations for G723 Annex A

When the offer or answer has G723 and the annexa parameter is absent, the offerer or answerer knows that it has implied the default "annexa=yes". This is because the annexa attribute is part of the original registration of audio/G723 [RFC4856]. All implementations that support G723 understand the annexa attribute. Hence, this case MUST be considered as if the offer or answer has G723 with annexa=yes.

When the offer has G723 with annexa=yes and the answer has G723 with annexa=no, the offerer and answerer MUST proceed as if G723 is negotiated with annexa=no.

When the offer has G723 with annexa=no, after the offer/answer completion the offerer and answerer MUST proceed as if G723 is negotiated with annexa=no.

When the offer has G723 with annexa=no, the reason for not mandating that the answer MUST have annexa=no for G723 is that there are implementations that omit the annexa parameter in answer. In such cases, the offerer and answerer proceed as if G723 is negotiated with annexa=no.

When the offer has G723 with no annexa parameter and the answer has G723 with annexa=yes, the offerer and answerer MUST proceed as if G723 is negotiated with annexa=yes.

### 3.3. Offer/Answer Considerations for G729 Annex B, G729D Annex B, and G729E Annex B

In this section, G729 represents any of G729 or G729D or G729E.

When the offer or answer has G729 and the annexb parameter is absent, the offerer or answerer knows that it has implied the default "annexb=yes". This is because the annexb attribute is part of the original registration of audio/G729 [RFC4856]. All implementations that support G729 understand the annexb attribute. Hence, this case MUST be considered as if the offer or answer has G729 with annexb=yes.

When the offer has G729 with annexb=yes and the answer has G729 with annexb=no, the offerer and answerer MUST proceed as if G729 is negotiated with annexb=no.

When the offer has G729 with annexb=no, after the offer/answer completion the offerer and answerer MUST proceed as if G729 is negotiated with annexb=no.

When the offer has G729 with annexb=no, the reason for not mandating that the answer MUST have annexb=no for G729 is that there are implementations that omit the annexb parameter in the answer. In such cases, the offerer and answerer proceed as if G729 is negotiated with annexb=no.

When the offer has G729 with no annexb parameter and the answer has G729 with annexb=yes, the offerer and answerer MUST proceed as if G729 is negotiated with annexb=yes.

## 4. Examples

### 4.1. Offer with G729 annexb=yes and Answer with G729 annexb=no

[Offer with G729 annexb=yes]

```
v=0
o=alice 2890844526 2890844526 IN IP4 host.atlanta.example.com
s=
c=IN IP4 host.atlanta.example.com
t=0 0
m=audio 49170 RTP/AVP 18
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=yes
```

[Answer with G729 annexb=no]

```
v=0
o=bob 1890844326 1890844326 IN IP4 host.bangalore.example.com
s=
c=IN IP4 host.bangalore.example.com
t=0 0
m=audio 19140 RTP/AVP 18
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
```

In the above example, the offerer and answerer proceed as if G729 is negotiated with annexb=no.

### 4.2. Offer with G729 annexb=yes and Answer with G729 and No annexb Parameter

[Offer with G729 annexb=yes]

```
v=0
o=alice 2890844526 2890844526 IN IP4 host.atlanta.example.com
s=
c=IN IP4 host.atlanta.example.com
t=0 0
m=audio 49170 RTP/AVP 18
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=yes
```

[Answer with G729 and no annexb parameter]

```
v=0
o=bob 1890844326 1890844326 IN IP4 host.bangalore.example.com
s=
c=IN IP4 host.bangalore.example.com
t=0 0
m=audio 19140 RTP/AVP 18
a=rtpmap:18 G729/8000
```

In the above example, the offerer and answerer proceed as if G729 is negotiated with annexb=yes.

#### 4.3. Offer with G729 and No annexb Parameter and Answer with G729 annexb=no

[Offer with G729 and no annexb parameter]

```
v=0
o=alice 2890844526 2890844526 IN IP4 host.atlanta.example.com
s=
c=IN IP4 host.atlanta.example.com
t=0 0
m=audio 49170 RTP/AVP 18
a=rtpmap:18 G729/8000
```

[Answer with G729 annexb=no]

```
v=0
o=bob 1890844326 1890844326 IN IP4 host.bangalore.example.com
s=
c=IN IP4 host.bangalore.example.com
t=0 0
m=audio 19140 RTP/AVP 18
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
```

In the above example, the offerer and answerer proceed as if G729 is negotiated with annexb=no.

## 5. Security Considerations

The guidelines described in [RFC6562] are to be followed for Use of Voice Activity Detection (i.e., Annex A or Annex B) with the Secure Real-time Transport Protocol (SRTP).

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