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ISUP Cause Location Parameter for the SIP Reason Header Field
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Abstract

The SIP Reason header field is defined for carrying ISUP cause values as well as SIP response codes. Some services in SIP networks may need to know the ISUP location where the call was released in the PSTN network to correctly interpret the reason of release.

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[1.](#) Introduction

The SIP Reason header field specification [[RFC3326](#)] describes a SIP header field that is used to indicate that a SIP request is carrying the reason of release. It may be an SIP response or ISUP release cause as specified within [[Q.850](#)]. [[RFC3326](#)] does specify that a ISUP [[Q.850](#)] cause code can be carried within a SIP response. The [[Q.850](#)] location information identifies the part of the ISUP network where the call was released.

This document adds a location value parameter to the reason-extension parameter in [[RFC3326](#)] so that the [[Q.850](#)] location value can be interworked from the PSTN. The interworking from PTSN needs only to include the location received by the interworking gateway.

[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.](#) Rationale

The primary intent of the parameter defined in this specification is for use in IMS networks defined by 3GPP but also open to be used by any other network. The purpose of this parameter is to transport the location of call release from the originating PSTN entity to the SIP entity receiving the response or BYE message containing the location of the call release. The ISDN location is defined in [[Q.850](#)].

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4. Mechanism

As defined by [\[RFC3326\]](#) a Reason header field MAY appear in any request in a dialog, in any CANCEL request and in any response whose status code explicitly allows the presence of this header field. The syntax of the header field follows the standard SIP parameter syntax.

The mechanism employed adds a parameter with the ISUP location value defined in [\[Q.850\]](#) to the Reason header field that identifies the [\[Q.850\]](#) location of the call release in ISUP as defined in [\[Q.850\]](#). The location is a 4 bit value which reflects the possible locations where an ISUP call is released. Some values are spare or reserved for national use. The Augmented BNF (ABNF) [\[RFC5234\]](#) for this parameter is shown in Figure 1.

```
reason-extension =/ isup-cause-location
isup-cause-location = "location" EQUAL string
```

The following values shall be used as location:

U	for 0 0 0 0 user
LPN	for 0 0 0 1 private network serving the local user
LN	for 0 0 1 0 public network serving the local user
TN	for 0 0 1 1 transit network
RLN	for 0 1 0 0 public network serving the remote user
RPN	for 0 1 0 1 private network serving the remote user
LOC-6	for 0 1 1 0 spare
INTL	for 0 1 1 1 international network
LOC-8	for 1 0 0 0 spare
LOC-9	for 1 0 0 1 spare
BI	for 1 0 1 0 network beyond interworking point
LOC-11	for 1 0 1 1 spare
LOC-12	for 1 1 0 0 reserved for national use
LOC-13	for 1 1 0 1 reserved for national use
LOC-14	for 1 1 1 0 reserved for national use
LOC-15	for 1 1 1 1 reserved for national use

Figure 1: isup-cause-location

Note: These are the values defined within [\[Q.850\]](#) as location. Thus other values are not within the scope of this document.

Depending on the direction the UAC or UAS shall include the isup-cause-location when setting up the Reason header field with a [\[Q.850\]](#) cause. This approach is only valid in cases when the ISUP [\[Q.850\]](#) location is available.

The use of the location header is restricted to Q850 cause values in other cases the location, if present, MUST be silently discarded.

5. Example

The following example shows a SIP 404 response message containing a Reason header field with a [Q.850] cause value and a isup-cause-location value. The 404 Response will be set up when a gateway receives an ISUP Release with a [Q.850] cause set to 1 meaning "Unallocated (unassigned) number", i.e. the number is not known in the PSTN.

404 Not Found

SIP/2.0 404 Not Found

```
From: Alice <sips:alice@atlanta.example.com>;tag=1234567
To: Bob <sips:bob@biloxi.example.com>;tag=765432
Call-ID: 12345600@atlanta.example.com
CSeq: 1 INVITE
Reason: Q.850;cause=1;text="Unallocated (unassigned) number";
location=LN
Content-Length: 0
```

Figure 2: Example Location in Reason header field.

6. Privacy Considerations

This document doesn't change any of the privacy considerations described in [RFC3326]. While the addition of the isup-cause-location parameter does provide an indicator of the entity that added the location in the signaling path this provides little more exposure than the [Q.850] cause itself.

7. Security Considerations

This document doesn't change any of the security considerations described in [RFC3326]. The addition of the isup-cause-location parameter does provide an indicator of the [Q.850] location where the call was released within the PSTN. This information may be used for specific location driven services but does not create any additional security constraints. But since the [Q.850] location is very imprecise the [Q.850] location value itself will not add any major security constraint. The use of this parameter is not restricted to a specific architecture.

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8. IANA Considerations

8.1. Registration of isup-cause-location Parameter for reason header field

This document calls for IANA to register a new SIP header parameter as per the guidelines in [RFC3968], which will be added to Header Field Parameters sub-registry under <http://www.iana.org/assignments/sip-parameters>.

Header Field: Reason

Parameter Name: location

9. Acknowledgments

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