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Conveying Feature Tags with the Session Initiation Protocol (SIP) REFER Method

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Abstract

The SIP "Caller Preferences" extension defined in RFC 3840 provides a mechanism that allows a SIP request to convey information relating to the originator's capabilities and preferences for handling of that request. The SIP REFER method defined in RFC 3515 provides a mechanism that allows one party to induce another to initiate a SIP request. This document extends the REFER method to use the mechanism of RFC 3840. By doing so, the originator of a REFER may inform the recipient as to the characteristics of the target that the induced request is expected to reach.

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1. Introduction

This document extends the SIP [2] REFER method defined in RFC 3515 [3] to be used with feature parameters defined in RFC 3840 [4].

Feature tags are used by a UA to convey to another UA information about capabilities and features. This information can be shared by a UA using a number of mechanisms, including REGISTER requests and responses and OPTIONS responses. This information can also be shared in the context of a dialog by inclusion with a remote target URI (Contact URI).

Feature tag information can be very useful to another UA. It is especially useful prior to the establishment of a session. For example, if a UA knows (through an OPTIONS query, for example) that the remote UA supports both video and audio, the calling UA might call, offering video in the SDP. Another example is when a UA knows that a remote UA is acting as a focus and hosting a conference. In this case, the UA might first subscribe to the conference URI and find out details about the conference prior to sending an INVITE to join.

This extension to the REFER method provides a mechanism by which the REFER-Issuer can provide this useful information about the REFER-Target capabilities and functionality to the REFER-Recipient by including feature tags in the Refer-To header field in a REFER request.

2. Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in RFC 2119 [1].

To simplify discussions of the REFER method and its extensions, three new terms are used throughout the document:

- REFER-Issuer: the UA issuing the REFER request
- REFER-Recipient: the UA receiving the REFER request
- REFER-Target: the UA designated in the Refer-To URI

3. Definitions

The Refer-To BNF from RFC 3515:

```
Refer-To = ("Refer-To" / "r") HCOLON ( name-addr / addr-spec )
                  *(SEMI generic-param)
```

is extended to:

```
Refer-To = ("Refer-To" / "r") HCOLON ( name-addr / addr-spec )
                  *(SEMI refer-param)
refer-param = generic-param / feature-param
```

where feature-param is defined in Section 9 of RFC 3840 [4].

Note that if any URI parameters are present, the entire URI must be enclosed in "<" and ">". If the "<" and ">" are not present, all parameters after the URI are header parameters, not URI parameters.

4. Examples

4.1. isfocus Feature Tag Usage

The example below shows how the "isfocus" feature tag can be used by REFER-Issuer to tell the REFER-Recipient that the REFER-Target is a conference focus and, consequently, that sending an INVITE will bring the REFER-Recipient into the conference:

```
Refer-To: sip:conf44@example.com;isfocus
```

4.2. Voice and Video Feature Tags Usage

The example below shows how a REFER-Issuer can tell the REFER-Recipient that the REFER-Target supports audio and video and, consequently, that a video and audio session can be established by sending an INVITE to the REFER-Target:

```
Refer-To: "Alice's Videophone" <sip:alice@videophone.example.com>
                ;audio;video
```

4.3. Example with URI parameters and multiple feature tags

The example below shows how the REFER-Issuer can tell the REFER-Recipient that the REFER-Target is a voicemail server. Note that the transport URI parameter is enclosed within the "<" and ">" so that it is not interpreted as a header parameter.

```
Refer-To: <sip:alice-vm@example.com;transport=tcp>
                ;actor="msg-taker";automata;audio
```

5. Security Considerations

Feature tags can provide sensitive information about a user or a UA. As such, RFC 3840 cautions against providing sensitive information to another party. Once this information is given out, any use may be made of it, including relaying to a third party as in this specification.

A REFER-Issuer MUST NOT create or guess feature tags. Instead, a feature tag included in a REFER SHOULD be discovered in an authenticated and secure method (such as an OPTIONS response or from a remote target URI in a dialog) directly from the REFER-Target.

It is RECOMMENDED that the REFER-Issuer includes in the Refer-To header field all feature tags that were listed in the most recent Contact header field of the REFER-Target.

A feature tag provided by a REFER-Issuer cannot be authenticated or certified directly from the REFER request. As such, the REFER-Recipient MUST treat the information as a hint. If the REFER-Recipient application logic or user's action depends on the presence of the expressed feature, the feature tag can be verified. For example, in order to do so, the REFER-Recipient can directly send an OPTIONS query to the REFER-Target over a secure (e.g., mutually authenticated and integrity-protected) connection. This protects the REFER-Recipient against the sending of incorrect or malicious feature tags.

6. Acknowledgements

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7. Normative References

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[4] Rosenberg, J., Schulzrinne, H., and P. Kyzivat, "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)", RFC 3840, August 2004.

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