     Requirements for indication of features supported by a SIP proxy
            draft-ietf-sipcore-proxy-feature-reqs-03.txt

Abstract

   The Session Initiation Protocol (SIP) "Caller Preferences" extension
   defined in RFC 3840 provides a mechanism that allows a SIP message to
   convey information relating to the originator's supported features/
   capabilities. This document defines requirements for a mechanism
   that would allow SIP proxies to convey information relating to the
   proxy's supported features/capabilities.

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1. Introduction

The Session Initiation Protocol (SIP) "Caller Preferences" extension
defined in RFC 3840 [RFC3840] provides a mechanism that allows a SIP
message to convey information relating to the originator's supported
features/capabilities.

It can be useful for SIP proxies to indicate supported feature/
capabilities, that might trigger actions and enable functions in
other SIP entities.

This document defines requirements for a mechanism that would allow
SIP proxies to convey information related to the proxy's supported
features/capabilities.

1.1. Use-case: IMS Service Continuity, handover of session in alerting
     state

The 3rd Generation Partnership Project (3GPP) defines a IP Multimedia
Subsystem (IMS) Service Continuity mechanism [3GPP.23.237] for
handover of Packet Switched (PS) sessions to Circuit Switched (CS)
calls.

The handover is controlled by a Service Centralization and Continuity
Application Server (SCC AS). When a session is established the User
Equipment (UE) needs to determine whether SCC AS in signalling path
of the session supports handover of session in alerting state (i.e.
180 Ringing response has already been sent or received but the dialog
is not confirmed dialog yet) or not.

When handover occurs and a session in alerting state exists and both
UE and SCC AS indicated support of the handover of session in
alerting state, then the UE and SCC AS perform handover for the
session in alerting state.

NOTE: The UE indicates the support of the handover of session in
alerting state by the feature tag included in Contact header field.

1.2. Use-case: IMS Enhanced Service Continuity

The 3rd Generation Partnership Project (3GPP) defines a IP Multimedia
Subsystem (IMS) Service Continuity mechanism [3GPP.23.237] for
handover of Packet Switched (PS) sessions to Circuit Switched (CS)
calls. The handover can be performed by a Service Centralization and
Continuity Application Server (SCC AS), or by a SCC AS together with
an Access Transfer Control Function (ATCF), that acts as a SIP proxy.
Delegating part of the session handover functionality to an ATCF
provides advantages related to voice interruption during session

handover etc, since the ATCF is located in the same network as the
user.

1.2.1. Use-case: IMS Enhanced Service Continuity, ATCF discovery

In order for an SCC AS to delegate part of the session handover
functionality to an ATCF, when the SCC AS is informed by the
registrar about an accepted REGISTER transaction, the SCC AS needs to
determine whether a proxy supporting the ATCF functionality is in the
registration path.

1.2.2. Use-case: IMS Enhanced Service Continuity, identifying sessions subject to handover

In order for ATCF to perform the delegated part of the session
handover functionality, when a session is set up, the ATCF needs to
determine whether a SIP proxy supporting the SCC AS functionality is
in the signalling path of the session.

1.2.3. Use-case: IMS Enhanced Service Continuity, indicating handover subfeature support

As the session handover functionality has been specified over several
3GPP releases, some subfeatures of the handover functionality are
optional. Examples are:

- The handover of sessions with audio on hold (called the MSC server
assisted mid-call feature); and

- The handover of sessions where a 180 Ringing response to the
initial SIP INVITE request has already been sent or received but a
final response has not been sent or received yet (called the SRVCC
for calls in alerting phase).

The SCC AS needs to be aware of support of those subfeatures in ATCF,
in order for the UE and the SCC AS to execute the correct handling
when the handover occurs.

When ATCF receives a SIP REGISTER request, the ATCF indicates the
support of those subfeatures along the indication of ATCF
functionality.

When SCC AS is informed about the new/updated binding where a proxy
indicated support of ATCF functionality along with support of those
subfeatures, the SCC AS discovers the support of those subfeatures in
the ATCF.

[1.3](). Use-case: IMS Inter-UE Transfer

The 3rd Generation Partnership Project (3GPP) defines inter-UE transfer enhancements [[3GPP.24.837]()] which enhance delivery of media of a session to several User Equipments (UE).

The Service Centralization and Continuity Application Server (SCC AS) serving one of the UEs acts as local hub for the session. The UE controls the media of the session and is called controller UE.

Triggered by requests from the controller UE, the SCC AS serving the controller UE transfers media of the session to other UEs, called controlee UEs, by sending INVITE request offering the media to be transferred.

When an INVITE request is routed to the UE, the SCC AS serving the UE needs to determine whether a SIP proxy supporting the inter-UE transfer enhancements functionality (i.e. SCC AS of the controller UE) is already in the signalling path.

If so, the SCC AS proxies the signalling without further handling as there is already an existing local hub for the session.

If not, the SCC AS acts as local hub for the session.

[2](). Conventions

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 [BCP 14](), [RFC 2119]() [[RFC2119]()].

[3](). Requirements

REQ-1: It MUST be possible for a SIP proxy to indicate, and convey to other SIP entities in the signalling path of a registration request, support of a particular feature/capability.

REQ-2: It MUST be possible for a SIP proxy to indicate, and convey to other SIP entities in the signalling path of a dialog-forming request, support of a particular feature/capability.

REQ-3: It MUST be possible for a SIP proxy to indicate that the indicated support of a feature/capability only applies to other SIP entities in the direction towards one of the SIP endpoints in the signalling path.

REQ-4: A SIP proxy MUST NOT, when indicating support of a feature/
capability, make any assumptions that SIP entities in the signalling
path that receive the indicator will support, or understand the
meaning of, the feature/capability, or even support the proxy
feature/capability indication mechanism as a whole.

REQ-5: A SIP proxy MUST be able to indicate support of a feature/
capability to other SIP entities in the signaling path, even if some
SIP entities in the signaling path (possibly including the UAC and/or
UAS) do not support, or understand the meaning of, the feature/
capability, or even support the proxy feature/capability indication
mechanism as a whole.

REQ-6: It MUST be possible to indicate whether indicated support of a
feature/capability applies to specific registration, to a specific
dialog, or to all dialogs created as part of INVITE transaction.

NOTE: This requirement might be fully implemented as part of the
protocol mechanism, or parts might be left to be specified in a
feature/capability specification, or it might be left to be specified
in a feature/capability specification completely.

REQ-7: It MUST be possible to assign additional parameters (either as
a single value, or a list of values) to a feature/capability
indicator, in order to provide additional information about the
feature/capability.

REQ-8: If a SIP entity that supports the proxy feature/capability
indication mechanism receives a feature support indication that it
does not understand, it MUST act as if it hadn't received the
indication.

REQ-9: If a SIP entity that does not support the proxy feature/
capability indication mechanism receives a feature support
indication, it MUST act as if it hadn't received the indication.

REQ-10: SIP entities on the path of the SIP message MUST be able to
inspect the feature/capability support indicators introduced by other
entities.

REQ-11: A feature/capability support indicator MUST only be used to
indicate support of a feature/capability, and MUST NOT be used to
indicate whether procedures associated with the feature/capability
have been applied or not.

REQ-12: It MUST be possible to determine which features/capabilities
are supported by the same proxy.

REQ-13: A SIP proxy that indicates support of a feature/capability associated with a dialog MUST take the necessary steps to ensure it is part of the signaling path of the remainder that dialog, by indicating the support of the feature/capability as part of a dialog forming transaction, or as part of a target refresh request within a dialog.

REQ-14: A procedure for registering feature/capability indication values, which prevents name collisions of indicators, with IANA MUST be defined.

4. Security Considerations

Feature/capability support indications can provide sensitive information about a SIP entity. RFC 3840 cautions against providing sensitive information to another party. Once this information is given out, any use may be made of it.

5. IANA Considerations

None identified.

6. Acknowledgements

Thanks to Paul Kyzivat and Robert Sparks for their comments and guidance on the mailing list. Thanks to Andrew Allen and Dale Worley for providing text on additional use-cases. Thanks to Cullen Jennings for providing text on additional requirements. Thanks to Dale Worley for providing comments and text improvement suggestions. Thanks to Hadriel Kaplan for telling us how SBCs mess up the mechanisms we try to specify.

Thanks to Robert Sparks, Adam Roach and Paul Kyzivat for giving working procedure guidance.

7. Change Log

[RFC EDITOR NOTE: Please remove this section when publishing]

Changes from draft-ietf-sipcore-proxy-feature-reqs-02
o   Changes based on comments from Robert Sparks at IETF#82 (http:// www.ietf.org/mail-archive/web/sipcore/current/msg04473.html).

o REQ-10: now talks about having access to the information, rather
   than talking specifically about making routing decisions.
o REQ-8: editorial modification, to better distinguish it from
   REQ-9.
o New REQ-13 (old REQ-13 becomes REQ-14) added.
o REQ-14: indication that the IANA registration procedure will
   prevent name collision between feature indications.
Changes from draft-ietf-sipcore-proxy-feature-reqs-01
o New REQ-12 added (old REQ-12 becomes REQ-13).
o New use-case added (section 1.2.3).
Changes from draft-ietf-sipcore-proxy-feature-reqs-00
o New REQ-5 added (IETF#81).
o New REQ-9 added (Dale Worley).
o Text added to REQ-4 and REQ-5, indicating that the requirement
   applies also in cases where an entity does not support the
   mechanism as a whole (Dale Worley).
o Usage of "session establishment transactions" terminology in
   REQ-6, in order to avoid misunderstanding of "session" (Dale
   Worley).
o Editorial correction in REQ-7: "additional parameter"->"additional
   parameters"
o Editorial clarifications to use-cases.

8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
           Requirement Levels", BCP 14, RFC 2119, March 1997.

8.2. Informative References

[RFC3840] Rosenberg, J., Schulzrinne, H., and P. Kyzivat,
           "Indicating User Agent Capabilities in the Session
           Initiation Protocol (SIP)", RFC 3840, August 2004.

[3GPP.23.237]
           3GPP, "IP Multimedia Subsystem (IMS) Service Continuity;
           Stage 2", 3GPP TS 23.237 10.7.0, September 2011.

[3GPP.24.837]
           3GPP, "IP Multimedia (IM) Core Network (CN) subsystem
           inter-UE transfer enhancements; Stage 3", 3GPP TR 24.837
           10.0.0, April 2011.

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