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C. Holmberg
I. Sedlacek
Ericsson
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Requirements for indication of features supported by a SIP proxy
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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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Internet-Draft

proxy feature

October 2011

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Table of Contents

- [1. Introduction](#) [3](#)
- [1.1. Use-case: IMS Service Continuity, handover of session
in alerting state](#) [3](#)
- [1.2. Use-case: IMS Enhanced Service Continuity](#) [3](#)
- [1.2.1. Use-case: IMS Enhanced Service Continuity, ATCF
discovery](#) [4](#)
- [1.2.2. Use-case: IMS Enhanced Service Continuity,
identifying sessions subject to handover](#) [4](#)
- [1.2.3. Use-case: IMS Enhanced Service Continuity,
indicating handover subfeature support](#) [4](#)
- [1.3. Use-case: IMS Inter-UE Transfer](#) [5](#)
- [2. Conventions](#) [5](#)
- [3. Requirements](#) [5](#)
- [4. Security Considerations](#) [7](#)
- [5. IANA Considerations](#) [7](#)
- [6. Acknowledgements](#) [7](#)
- [7. Change Log](#) [7](#)
- [8. References](#) [8](#)
- [8.1. Normative References](#) [8](#)
- [8.2. Informative References](#) [8](#)
- [Authors' Addresses](#) [8](#)

Internet-Draft

proxy feature

October 2011

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 contolee 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 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: Other SIP entities MUST be able to make routing decisions based on received feature/capability support indications.

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 procedure for registering feature/capability indication values 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-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.

Authors' Addresses

Christer Holmberg
Ericsson
Hirsalantie 11
Jorvas 02420
Finland

Email: christer.holmberg@ericsson.com

Ivo Sedlacek
Ericsson
Scheelevaegen 19C
Lund 22363
Sweden

Email: ivo.sedlacek@ericsson.com