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Abstract of document:

The present document provides the protocol details for the messaging service within the IP Multimedia CN Subsystem (IMS) based on the Session Initiation Protocol (SIP), the Session Description Protocol (SDP), the Message Session Relay Protocol (MSRP) and other protocols. The document covers immediate messaging, session-based messaging and session-based messaging conferences.

Where possible the present document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of SIP, SDP, MSRP and other protocols, either directly, or as modified by 3GPP TS 24.229. The present document is applicable to Application Servers (ASs) , Media Resource Function Controllers (MRFCs), Media Resource Function Processors (MRFPs) and to User Equipment (UE) providing messaging capabilities. This document does not cover the signalling between a MRFC and a MRFP.

Changes since last presentation to TSG Meeting #25:

CRs approved in CN1#36.

Outstanding Issues:

- MSRP protocol completion (dependant on IETF)
 - minor terminology and editorial issues
 - Call flows in Annex A are out of date and incorrect. To be corrected by CN1.
-

Contentious Issues:

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Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Core Network;
Messaging service using the IP Multimedia (IM) Core Network
(CN) subsystem;
Stage 3
(Release 6)**



The present document has been developed within the 3rd Generation Partnership Project (3GPP™) and may be further elaborated for the purposes of 3GPP.

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Keywords

UMTS, Network, IP, SIP, SDP, multimedia

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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document provides the protocol details for the messaging service within the IP Multimedia CN Subsystem (IMS) based on the Session Initiation Protocol (SIP), the Session Description Protocol (SDP), the Message Session Relay Protocol (MSRP) and the Conference Policy Control Protocol (CPCP). The document covers immediate messaging, session based messaging and session-based messaging conferences, as described in TS 22.340.

Where possible the present document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of SIP, SDP, MSRP and other protocols, either directly, or as modified by 3GPP TS 24.229.

The present document is applicable to Application Servers (ASs) , Media Resource Function Controllers (MRFCs), Media Resource Function Processors (MRFPs) and to User Equipment (UE) providing messaging capabilities.

This document does not cover the signalling between a MRFC and a MRFP.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "3G Vocabulary".
- [2] 3GPP TS 22.228: " Service requirements for the Internet Protocol (IP) multimedia core network subsystem; Stage 1".
- [3] 3GPP TS 23.218: "IP Multimedia (IM) Session Handling; IP Multimedia (IM) call model; Stage 2".
- [4] 3GPP TS 24.228: "Signalling flows for the IP multimedia call control based on SIP and SDP; Stage 3".
- [5] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP; Stage 3".
- [6] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [7] RFC 3261 (March 2002): "SIP: Session Initiation Protocol".
- [8] RFC 3428 (December 2002): "Session Initiation Protocol (SIP) Extension for Instant Messaging".
- [9] draft-ietf-simple-message-sessions-06.txt (May 2004): "The Message Session Relay Protocol".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

- [10] 3GPP TS 24.147: "Conferencing using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3".
- [11] 3GPP TS 22.340: "IP Multimedia System (IMS) messaging; Stage 1".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions given in TS 22.340 [11] apply:

Immediate messaging

Session based messaging

Session based messaging conferences

For the purposes of the present document, the [following] terms and definitions given in draft-ietf-simple-message-sessions [9] apply:

Host

Page-mode messaging

Session inactivity timer

Session-mode messaging

Session-mode messaging conferences

Visitor

For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.147 [10] apply:

Conferencing Application Server

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AS	Application Server
CN	Core Network
DM	Data manipulator
DMS	Data manipulation server
IM	IP Multimedia
IMS	IP Multimedia CN subsystem
IP	Internet Protocol
MRFC	Media Resource Function Controllers
MRFP	Media Resource Function Processors
MSRP	Message Session Relay Protocol
SBLP	Service Based Local Policy
SDP	Session Description Protocol
SIP	Session Initiation Protocol
UE	User Equipment
URL	Uniform Resource Locator

4 Messaging overview

The basic services for the IP Multimedia core network Subsystem (IMS), as defined in 3GPP TS 24.229 [5], allow a user to initiate, modify and terminate media sessions using the Session Initiation Protocol, as defined in RFC 3261 [7]. Although these basic mechanisms already allow the exchange of instant messaging information using SIP, this functionality can be extended to provide a richer service within the IMS.

The messaging service within the IM CN subsystem provides the means for a user to send or receive single messages immediately to / from another user and to create and participate in a messaging conference with one or more other users. Participants to such message based communication may be internal or external to the home network.

When to use an immediate message and when to use a session-based messaging session will depend on the application.

NOTE: Some participants may always use session-based messaging, while others may use immediate messaging or a combination of session-based messaging and immediate messaging dependant of the characteristics of the messaging session. The criteria are implementation and application specific.

For immediate messaging the procedures for page-mode messaging, as defined in RFC 3428 or for session-mode messaging, as defined in draft-ietf-simple-message-sessions are utilized. When to use an page-mode messaging and when to use session-mode messaging session for the purpose of immediate messaging will depend on the application.

For session-based messaging and session-based messaging conferences, the Message Session Relay Protocol (MSRP) is utilized to transport messages.

The architecture for the 3GPP messaging is specified in 3GPP TS 23.228 [6] and 3GPP TS 23.218 [3].

5 Protocol using SIP for page-mode messaging

5.1 Introduction

5.2 Functional entities

5.2.1 User Equipment (UE)

For the purpose of page-mode messaging, the UE shall implement the role of a Participant as described in subclause 5.3.1.

5.2.2 Application Server (AS)

For the purpose of page-mode messaging, an Application Server may implement the role of a List Server as described in subclause 5.3.2. An Application Server may implement the role of a Participant as described in subclause 5.3.1

5.3 Role

5.3.1 Participant

5.3.1.1 General

For the purpose of page-mode messaging a participant will send a page-mode message using a SIP MESSAGE request as defined in RFC 3428 [8] to another participant.

5.3.1.2 Sending of an immediate message

When sending an page-mode message to another participant, the participant shall construct and send a MESSAGE request in accordance with RFC 3428 [8] and subclause 5.1.2A.1 of 3GPP TS 24.229 [5].

5.3.1.3 Receiving an immediate message

Upon receipt of a MESSAGE request, the participant shall perform the procedures as described in RFC 3428 [8] and subclause 5.1.2A.2 of 3GPP TS 24.229 [5].

NOTE: A MESSAGE request can be used for applications other than immediate messaging (e.g. 3GPP TS 23.228 [6] subclause 5.4.9), and the handling of received MESSAGE requests for such applications is outside the scope of this specification.

6 Protocol using SIP for session-mode messaging

6.1 Introduction

6.2 Functional entities

6.2.1 User Equipment (UE)

For the purpose of session-mode messaging, the UE shall implement the role of a Participant as described in subclause 6.3.1.

6.3 Role

6.3.1 Participant

6.3.1.1 General

The participant shall perform SIP related session procedures in accordance with 3GPP TS 24.229 [5] to set up the dialog used for session-based messaging.

6.3.1.2 Session initiation - mobile originating case

When the originating participant wishes to engage the terminating participant in a session-mode message session, it shall use the call initiation procedure specified in TS 24229 [5]. The Request URI header shall include the URI of the terminating participant.

6.3.1.3 Session initiation - mobile terminating case

When the terminating participant receives an initial INVITE request from the originating endpoint proposing a message session, the terminating participant shall apply the procedures as specified in 3GPP TS 24.229 [5].

6.3.2 Intermediate Node

6.3.2.1 General

The intermediate node shall act as a Routing B2BUA as specified in subclause 5.7 in TS 24.229 [5].

6.3.2.2 Generic procedures for all methods at the intermediate node

6.3.2.2.1 Intermediate node ñ originating case

The intermediate node shall follow the procedures of 3GPP TS 24.229 [5] subclause 5.7.3 when acting as an originating UA.

6.3.2.2.2 Intermediate node ñ terminating case

Upon receipt of an initial request the intermediate node shall follow the procedures of 3GPP TS 24.229 [5] subclause 5.7.1.2 in relation to the contents of the P-Charging-Function-Addresses header and the P-Charging-Vector header.

When creating the first response for this initial request, the intermediate node shall:

- 1) include the P-Charging-Vector header including:
 - a) the value of the icid parameter as received in the initial request; and
 - b) the value of the orig-ioi parameter as received in the initial request; and
 - c) the term-ioi parameter, indicating the network of the intermediate node; and
- 2) include the P-Charging-Function-Addresses header as received in the initial request or, if the P-Charging-Function-Addresses header was not received in the initial request indicate the values applicable for the conference in the P-Charging-Function-Addresses header.

When creating responses for an initial INVITE request, the intermediate node shall additionally send the 200 (OK) response to the initial INVITE request only after the resource reservation has been completed.

6.3.2.3 Session Initiation

6.3.2.3.1 Session initiation ñ originating case

The intermediate node shall follow the procedures of 3GPP TS 24.229 [5] at call initiation.

The intermediate node shall populate the INVITE as specified for a Routing B2BUA with the following clarification:

- a) the Request URI to the URI as in the received Request URI;
- b) the To header to the same display name and URI as in the received To header;
- c) the From header sent includes the same display name and URI as in the From header in the received INVITE; and
- d) the P-Asserted-Identity header and privacy includes the same information as in the received P-Asserted-Identity header and Privacy header; and

If the intermediate node is not able to establish a TCP connection for the MSRP session the intermediate node shall send BYE towards the participant and release the associated resources.

6.3.2.3.2 Session initiation ñ terminating case

Upon receipt of an INVITE request that includes an the terminating participant URI in the request URI, the intermediate node shall:

- 1) verify the identity of the user as described in subclause 5.7.1.4 of 3GPP TS 24.229 [5] and authorize the request as described in subclause 5.7.1.5 of 3GPP TS 24.229 [5]. The following actions in this subclause shall only be performed if the request can be authorized; and
- 2) establish the session in accordance with TS 24.229 [5].
- 3) create a 200 (OK) response.

7 Protocol using SIP for session-mode messaging conferences

7.1 Introduction

Void.

7.2 Functional entities

7.2.1 User Equipment (UE)

For the purpose of session-mode messaging conferences, the UE shall implement the role of a Participant as described in subclause 6.3.1 and the the procedures described in subclause 5.2.1 in 3GPP TS 24.147 [10].

7.2.2 Media Resource Function Controller (MRFC)

For the purpose of session-based messaging conferences, the MRFC shall follow the procedures described in subclause 5.2.2 in 3GPP TS 24.147 [10].

7.2.3 Conferencing Application Server (AS)

For the purpose of session-based messaging conferences, the AS shall follow the procedures described in subclause 5.2.3 in 3GPP TS 24.147 [10].

8 Protocol using SDP for session-mode messaging and session-mode messaging conferences

8.1 Introduction

8.2 Functional entities

8.2.1 User Equipment (UE)

For the purpose of session-mode messaging and session-mode messaging conferences, the UE shall implement the role of

- an SDP offerer as described in subclause 8.3.1; and
- an SDP answerer as described in subclause 8.3.2.

8.2.2 Media Resource Function Controller (MRFC)

As the function split between the MRFC and the AS is out of scope of the present document, the procedures for the MRFC are described together with those for the AS in subclause 8.2.3.

8.2.3 Application Server (AS)

As the functional split between the AS and the MRFC is out of scope of the present document, the procedures are described for a combined AS and MRFC. The AS and MRFC may either be collocated, or interoperate using a proprietary protocol and a proprietary functional split.

The AS shall implement the role of

- an intermediate node as described in subclause 8.3.3 when engaged in a session mode messaging conference; or
- a SDP offerer, as described in subclause 8.3.1, and a SDP answerer, as described in subclause 8.3.2 when engaged in a session mode session between a SDP offerer and SDP answerer. NOTE: An AS, not performing one of the above specific functionalities, that is on the signalling path for the related SIP signalling, is not mandated to terminate the related MSRP.

8.3 Role

8.3.1 SDP offerer

When an SDP offerer wants to create a session mode messaging session, the SDP offerer shall populate the SDP as specified in subclause 6.1 in TS 24.229[5]. SDP offerer shall also include:

- a) a media attribute in accordance with draft-ietf-simple-message-sessions [9]; and
- b) the supported MIME types in the accept-types or accept-wrapped-types attributes in accordance with draft-ietf-simple-message-sessions [9]; and
- c) the address of the SDP offerer in the path attribute, in accordance with draft-ietf-simple-message-sessions [9].

The SDP may also include a max-size attribute. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

At the receipt of the SDP answer the SDP offerer shall set up a TCP connection (if not already available) when an IP-CAN bearer with sufficient QoS is available.

8.3.2 SDP answerer

When receiving an SDP offer the SDP answerer shall populate the SDP answer as specified in subclause 6.1 in TS 24.229[5]. In addition the answerer shall include:

- a) a media attribute in accordance with the received media attribute in the SDP offer; and
- b) the supported MIME types in the accept-types or accept-wrapped-types attributes in accordance with draft-ietf-simple-message-sessions [9]; and
- c) the MSRP URI of the SDP answerer in the path attribute in accordance with draft-ietf-simple-message-sessions [9].

The SDP may also include a max-size attribute. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

8.3.3 Intermediate node

8.3.3.1 Intermediate node Originating case

8.3.3.1.1 Sending of a SDP offer

The intermediate node shall create a SDP offer, which shall include:

- a) a media attribute in accordance with the media attribute received in the received in the SDP offer.; and
- b) the supported MIME types in the accept-types or accept-wrapped-types attributes as provisioned in the intermediate node. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9]; and
- c) a MSRP URI of the Intermediate node in the path attribute to be used when the SDP answerer wants to send a MSRP message to the conference. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

The SDP may also include a max-size attribute. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

At the receipt of the SDP answer the Intermediate node shall set up a TCP connection (if not already available) when an IP-CAN bearer with sufficient QoS is available.

8.3.3.2 Intermediate node Terminating case

8.3.3.2.1 Sending of a SDP answer

The intermediate node shall at the receipt of a SDP offer create a SDP answer. The SDP answer shall include:

- a) a media attribute in accordance with the received media attribute in the SDP offer; and
- b) the supported MIME types in the accept-types or accept-wrapped-types attributes in accordance with draft-ietf-simple-message-sessions [9]; and
- c) a MSRP URI in the path attribute to be used when the SDP answerer shall send a MSRP message to the conference,. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

The SDP may also include a max-size attribute. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

9 Protocol using MSRP for session-mode messaging and session-mode messaging conferences

9.1 Introduction

9.2 Functional entities

9.2.1 User Equipment (UE)

9.2.1.1 General

The UE shall:

- implement the role of an MSRP sender as described in subclause 9.3.1; and
- implement the role of an MSRP receiver as described in subclause 9.3.2.

9.2.2 Application Server (AS)

As the functional split between the AS and the MRFP is out of scope of the present document, the procedures are described for a combined messaging conferencing AS and MRFP. The AS and MRFP may either be collocated, or interoperate using a proprietary protocol and a proprietary functional split.

For the purpose of an AS acting either as:

- an endpoint for session-mode messaging;
- an intermediate node for session-mode messaging; or
- a conferencing AS for session-mode messaging conferences,

the AS shall implement the role of:

- an intermediate node as described in subclause 9.3.3 when engaged in a session mode messaging conference; or
- a MSRP sender, as described in subclause 9.3.1, and a MSRP receiver, as described in subclause 9.3.2 when engaged in a session mode session between a MSRP sender and MSRP receiver.

NOTE: An AS, not performing one of the above specific functionalities, that is on the signalling path for the related SIP signalling, is not mandated to terminate the related MSRP.

9.2.3 Media Resource Function Processor (MRFP)

As the function split between the MRFP and the conferencing AS is out of scope of the present document, the procedures for the MRFP are described together with those for the AS in subclause 9.2.2.

9.3 Role

9.3.1 MSRP sender

9.3.1.1 MSRP sender sends a message

When a MSRP sender wishes to send a message, the MSRP sender shall ensure that the message length is not longer than the max-size attribute, as received in a SDP offer or a SDP answer. Depending on the message length the message may be included in one SEND request or chunked into a number of SEND requests. The MSRP sender shall follow the procedures and rules as specified in draft-ietf-simple-message-sessions [9], when the MSRP sender fragments a message into a number SEND requests.

The MSRP sender shall create a SEND request in accordance with draft-ietf-simple-message-sessions [9], where the value of To-Path is the MSRP URI shall be set to value of path attribute received in a SDP offer or a SDP answer..

9.3.2 MSRP receiver

When a MSRP receiver receives a SEND request, the MSRP receiver shall parse the SEND request. The MSRP receiver shall either send a response including:

- a) a 200 (OK) status-code , as specified in draft-ietf-simple-message-sessions [9], for the concerned SEND message if the parsing was successful; or
- b) an appropriate status-code, as specified in draft-ietf-simple-message-sessions [9], for the concerned SEND message if the parsing was unsuccessful.

The MSRP receiver shall send a REPORT request if this is explicit or implicit requested in the SEND request(s) belonging to the message. It shall either be:

- a) a successful REPORT request including status-code 200 (OK) if a complete message is received and the Report-Success header in the SEND request was set to `yes`; or
- b) an unsuccessful REPORT request including status-code other than 200 (OK) as defined in draft-ietf-simple-message-sessions [9] if the MSRP receiver can conclude that a complete message is not received and the Report-Failure header is set to `yes` or not included. The criteria to conclude that a complete message is not received are specified in draft-ietf-simple-message-sessions [9].

9.3.3 Intermediate node

9.3.3.1 Intermediate node terminating case

When an intermediate node receives a SEND request, the intermediate node shall:

- 1) parse the SEND request and either send a response including:
 - a) a 200 (OK) status-code, as specified in draft-ietf-simple-message-sessions [9], for the concerned SEND message, if the parsing was successful; or
 - b) an appropriate status-code, as specified in draft-ietf-simple-message-sessions [9], for the concerned SEND message if the parsing was unsuccessful.; and

- 2) determine that a complete message has been received. The following actions in this subclause shall only be performed if a complete message is received.

The MSRP receiver shall send a REPORT request if this is explicit or implicit requested in the SEND request(s) associated to the same message. It shall either be:

- a) a successful REPORT request including status-code 200 (OK) if the intermediate node concludes that all available users on the distribution list has received the complete message or a concerned user has received the complete message and the Report-Success header in the SEND request was set to `yes`; or
- b) an unsuccessful REPORT request including status-code other than 200 (OK) as defined in draft-ietf-simple-message-sessions [9] if the intermediate node conclude that a complete message has not been received or that a complete message has not been able to be delivered to all available users on the distribution list or to a particular member of the distribution list.

9.3.3.2 Intermediate node originating case

When an intermediate node wishes to send a message, the intermediate shall ensure that the message length is not longer than the max-size attribute, as received in a SDP offer or a SDP answer. Depending on the message length the message may be included in one SEND request or chunked into a number of SEND requests. The intermediate shall follow the procedures and rules as specified in draft-ietf-simple-message-sessions [9], when the intermediate node fragments a message into a number SEND requests.

The intermediate shall create a SEND request in accordance with draft-ietf-simple-message-sessions [9] with the following clarifications:

- 1) set the Report-Success header as received in the SEND request;
- 2) set the Report-Failure header as received in the SEND request; and
- 3) depending on the received MSRP URI
 - a) either send the SEND request to all available user of the conference; or
 - b) send the SEND request to one MSRP receiver.

10 Protocol for data manipulation at the Ut reference point

10.1 Introduction

10.2 Functional entities

10.2.1 User Equipment (UE)

For the purpose of SIP based conferences, the UE may implement the role of a XCAP client as described in subclause 10.3.1.

The UE shall implement HTTP digest AKA (see RFC 3310 [X]) and it shall initiate a bootstrapping procedure with the bootstrapping server function located in the home network, as described in 3GPP TS 24.109 [YY].

The UE shall acquire the subscriber's certificate from PKI portal by using a bootstrapping procedure, as described in 3GPP TS 24.109 [YY].

The UE shall implement Transport Layer Security (TLS) (see RFC 2246 [Y]). The UE shall be able to authenticate the authentication proxy based on the received certificate during TLS handshaking phase.

10.2.2 Media Resource Function Controller (MRFC)

As the function split between the MRFC and the AS is out of scope of the present document, the procedures for the MRFC are described together with those for the AS in subclause 10.2.3.

10.2.3 Application Server (AS)

The AS shall implement the role of a XCAP server as described in subclause 10.3.2. As the function split between the AS and the MRFC is out of scope of the present document, only the procedures are described for a combined AS and MRFC. The AS and MRFC may either be collocated, or interoperate using a proprietary protocol and a proprietary functional split.

For the purpose of SIP-based conferences, the AS/MRFC shall act as a XCAP Server, as described in subclause 10.3.2.

The AS/MRFC may implement the role of a privileged user as described in subclause 7.3.1.

If there is no authentication proxy in the network, then the AS/MRFC shall:

- implement the role of a network application function, as described in 3GPP TS 24.109 [YY];
- support HTTP digest authentication and certificate authentication; and
- implement TLS (see RFC 2246 [Y]).

Editor's Note: It needs to be clarified what physical entities can contain the Authentication Proxy and its relationship with the IMS architecture. Documentation for the case of a separate authentication proxy may need to be provided.

10.3 Role

10.3.1 XCAP client

A XCAP client shall support the manipulation of some or all of the conferencing policy data elements that are defined in draft-ietf-xcon-cpcp-xcap [Z]. The XCAP client shall comply with the requirement as specified for a privileged user role in subclause 5.3.1 in TS 24.147 [10].

10.3.2 XCAP Server

The XCAP server shall comply with the requirement as specified for a conference policy server role in subclause 5.3.1 in TS 24.147 [10].

Annex A (informative): Example signalling flows of messaging service operation

A.1 Scope of signalling flows

This annex gives examples of signalling flows for conferencing within the IP Multimedia CN Subsystem (IMS) based on the Session Initiation Protocol (SIP), SIP Events, the Session Description Protocol (SDP) and other protocols.

These signalling flows provide detailed signalling flows, which expand on the overview information flows provided in 3GPP TS 23.228 [6].

A.2 Introduction

A.2.1 General

A.2.2 Key required to interpret signalling flows

The key to interpret signalling flows specified in 3GPP TS 24.228 [4] subclause 4.1 applies with the additions specified below.

In order to differentiate between messages for SIP and MSRP, the following notation is used:

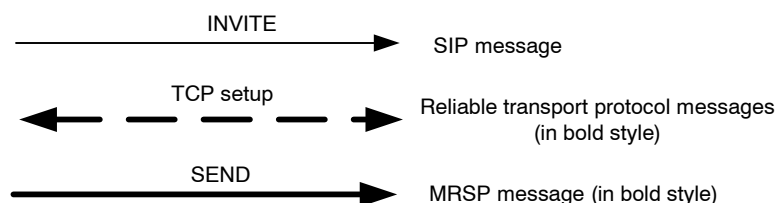


Figure A.2.2-1: Signalling flow notation

A.3 Signalling flows demonstrating immediate messaging

The signalling flow for immediate messaging is shown in subclause 10.6 of 3GPP TS 24.228 [4].

A.4 Signalling flows demonstrating session-based messaging

A.4.1 Introduction

This subclause provides signalling flows for session-based messaging, established both with and without preconditions.

How the signalling flow for session-based messaging looks like depends on the following:

- a) at what point in time the IP-CAN for the media component (MSRP) is set up; or
- b) whether preconditions and reliable provisional responses are used or not.

A.4.2 Establishing a session for session-based messaging without preconditions

Figure A.4.2-1 shows the establishment of an MSRP session between two users without the usage of preconditions and reliable provisional responses as well as the first message being sent over the established connection.

It is assumed that both the originating UE and terminating UE are using an IP-CAN with a separate bearer for SIP signalling which means that each UE needs to reserve a new IP-CAN bearer for the message session media component prior to sending the first MSRP message.

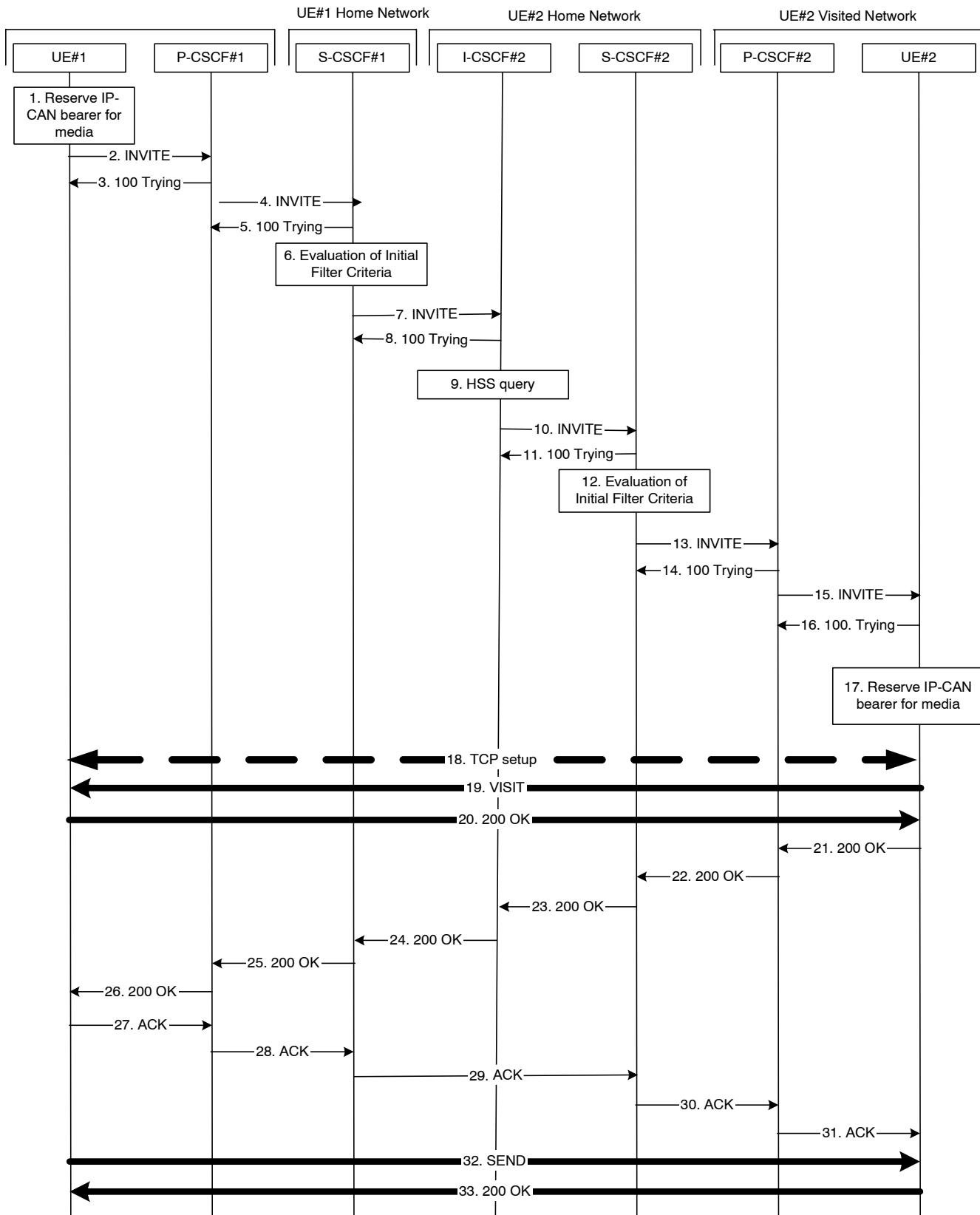


Figure A.4.2-1: Establishment of MSRP session

The details of the signalling flows are as follows:

1. Reserve IP-CAN bearer for media

The originating UE wants to initiate a session-based message session with the terminating UE. The originating UE reserves an IP-CAN bearer for the message session media component.

2. INVITE request (UE#1 to P-CSCF#1) - see example in table A.4.2-2

The originating UE creates a local MSRP URL, which can be used for the communication between the two user agents. It builds a SDP Offer containing the generated MSRP URL and assigns a local port number for the MSRP communication.

Table A.4.2-2: INVITE request (UE#1 to P-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:user2_public1@home2.net>
Call-ID: cb03a0s09a2sdfg1kj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
    port-c=8642; port-s=7531
Contact: <sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 my.msrp.dummy.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271

```

3. 100 (Trying) response (P-CSCF#1 to UE#1) - see example in table A.4.2-3

The P-CSCF responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.2-3: 100 (Trying) response (P-CSCF#1 to UE#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

4. INVITE request (P-CSCF#1 to S-CSCF#1) - see example in table A.4.2-4

The INVITE request is forwarded to the S-CSCF.

Table A.4.2-4: INVITE request (P-CSCF#1 to S-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

5. 100 (Trying) response (S-CSCF#1 to P-CSCF#1) - see example in table A.4.2-5

The S-CSCF responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.2-5: 100 (Trying) response (S-CSCF#1 to P-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

6. Evaluation of initial filter criteria

S-CSCF#1 validates the service profile of this subscriber and evaluates the initial filter criterias.

7. INVITE request (S-CSCF#1 to I-CSCF#2) - see example in table A.41-7

S-CSCF#1 forwards the INVITE request to the I-CSCF#2.

Table A.4.2-7: INVITE request (S-CSCF#1 to I-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+1-212-555-1111>
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"; orig-loi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

8. 100 (Trying) response (I-CSCF#2 to S-CSCF#1) - see example in table A.4.2-8

I-CSCF#2 sends a 100 (Trying) response provisional response to S-CSCF#1.

Table A.4.2-8: 100 (Trying) response (I-CSCF#2 to S-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

9. Cx: User Location Query procedure

The I-CSCF sends a query to the HSS to find out the S-CSCF of the called user. The HSS responds with the address of the current S-CSCF for the terminating subscriber.

10. INVITE request (I-CSCF#2 to S-CSCF#2) ñ see example in table A.4.2-10

I-CSCF#2 forwards the INVITE request to the S-CSCF#2 that will handle the session termination.

Table A.4.2-10: INVITE request (I-CSCF#2 to S-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
Route: <sip:scscf2.home2.net;lr>
Record-Route:
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

11. 100 (Trying) response (S-CSCF#2 to I-CSCF#2) ñ see example in table A.4.2-11

S-CSCF#2 responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.2-11: 100 (Trying) response (S-CSCF#2 to I-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

12. Evaluation of initial filter criterias

S-CSCF#2 validates the service profile of this subscriber and evaluates the initial filter criterias.

13. INVITE request (S-CSCF#2 to P-CSCF#2) ñ see example in table A.4.2-13

S-CSCF#2 forwards the INVITE request, as determined by the termination procedure. S-CSCF#2 remembers (from the registration procedure) the UE Contact address and the next hop CSCF for this UE.

Table A.4.2-13: INVITE request (S-CSCF#2 to P-CSCF#2)

```

INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 66
Route: <sip:pcscf2.visited2.net;lr>
Record-Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>,
    <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
P-Called-Party-ID: <sip:user2_public1@home2.net>
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

14. 100 (Trying) response (P-CSCF#2 to S-CSCF#2) ñ see example in table A.4.2-14

S-CSCF#2 receives a 100 (Trying) response provisional response to the INVITE request.

Table A.4.2-14: 100 (Trying) response (P-CSCF#2 to S-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

15. INVITE request (P-CSCF#2 to UE#2) ñ see example in table A.4.2-15

P-CSCF#2 forwards the INVITE request to the terminating UE.

Table A.4.2-15: INVITE request (P-CSCF#2 to UE#2)

```

INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 65
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>,
<sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
P-Called-Party-ID:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

16. 100 (Trying) response (UE#2 to P-CSCF#2) ñ see example in table A.4.2-16

The terminating UE sends a 100 (Trying) response provisional response to P-CSCF#2.

Table A.4.2-16: 100 (Trying) response (UE#2 to P-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

17. Reserve IP-CAN bearer for media

The terminating UE accepts the message session. The terminating UE reserves an IP-CAN bearer for the message session media component.

18. TCP setup

The terminating UE establishes a TCP connection using the IP-CAN bearers established in step 1 and step 17 to the host address and the port as specified in the MSRP URL received in the SDP Offer from the originating UE.

19. MSRP VISIT request (UE#1 to UE#2) ñ see example in table A.4.2-19

The terminating UE sends an MSRP VISIT request using the established TCP connection.

Table A.4.2-19: MSRP VISIT request (UE to UE)

```
MSRP VISIT
Boundary: dkei38sd
To-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
From-path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167
TR-ID: 2810
Message-ID: 2810
-----dkei38sd$
```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Closing:	Same boundary string as well as Continuation-Flag

20. MSRP 200 (OK) response (UE#2 to UE#1) ñ see example in table A.4.2-20

The originating UE that acts as an MSRP host returns an MSRP 200 (OK) response to the MSRP VISIT request using the established TCP connection.

Table A.4.2-20: 200 (OK) response (UE#2 to UE#1)

```
MSRP 200 OK
Boundary: wej28su
To-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
From-path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167
TR-ID: 2810
-----wej28su$
```

TR-ID:	The transaction ID for this MSRP transaction, as received in the related MSRP request.
---------------	--

21. 200 (OK) response (UE#2 to P-CSCF#2) ñ see example in table A.4.2-21

After the receipt of the the MSRP 200 (OK) response to the MSRP VISIT request, the terminating UE sends a 200 (OK) response for the INVITE request containing SDP that indicates that the terminating UE has successfully visited to the originating UE.

Table A.4.2-21: 200 (OK) response (UE#2 to P-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>>, <sip:scscf2.home2.net;lr>,
<sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
Privacy: none
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:user2_public1@home2.net>; tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Contact: <sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933617 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 my.MSRP.dummy.URL
t=0 0
m=message 9999 msrp *
a=accept-types:text/plain text/html message/cpim
a=path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167

```

22. 200 (OK) response (P-CSCF#2 to S-CSCF#2) ñ see example in table A.4.2-22

P-CSCF#2 forwards the 200 (OK) response to S-CSCF#2.

Table A.4.2-22: 200 (OK) response (P-CSCF#2 to S-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity: John Smith" <sip:user2_public1@home2.net>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

23. 200 (OK) response (S-CSCF#2 to I-CSCF#2) ñ see example in table A.4.2-23

S-CSCF#2 forwards the 200 (OK) response to I-CSCF#2.

Table A.4.2-23: 200 (OK) response (S-CSCF#2 to I-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
    term-ioi=home2.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
    ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

24. 200 (OK) response (I-CSCF#2 to S-CSCF#1) ñ see example in table A.4.2-24

I-CSCF#2 forwards the 200 (OK) response to S-CSCF#1.

Table A.4.2-24: 200 (OK) response (I-CSCF#2 to S-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
Privacy: none
P-Charging-Vector:
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

25. 200 (OK) response (S-CSCF#1 to P-CSCF#1) ñ see example in table A.4.2-25

S-CSCF#1 forwards the 200 (OK) response to P-CSCF#1.

Table A.4.2-25: 200 (OK) response (S-CSCF#1 to P-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

26. 200 (OK) response (P-CSCF#1 to UE#1) ñ see example in table A.4.2-26

P-CSCF#1 forwards the 200 (OK) response to the originating UE.

Table A.4.2-26: 200 (OK) response (P-CSCF#1 to UE#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:pcscf2.visited2.net;lr>, <sip:scscf2.home2.net;lr>,
    <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

27. ACK request (UE#1 to P-CSCF#1) ñ see example in table A.4.2-27

The UE responds to the 200 (OK) response with an ACK request sent to the P-CSCF#1.

Table A.4.2-27: ACK request (UE#1 to P-CSCF#1)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>,
      <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From: <sip:user1_public1@home1.net>;tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfgklkj490333
Cseq: 127 ACK
Content-Length: 0

```

28. ACK request (P-CSCF#1 to S-CSCF#1) ñ see example in table A.4.2-28

The P-CSCF#1 forwards the ACK request to S-CSCF#1.

Table A.4.2-28: ACK request (P-CSCF#1 to S-CSCF#1)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
      [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>, <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

29. ACK request (S-CSCF#1 to S-CSCF#2) - see example in table A.4.2-29

The S-CSCF#1 forwards the ACK request to the the S-CSCF#2.

Table A.4.2-29: ACK request (S-CSCF#1 to S-CSCF#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
      pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
      [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Route: <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

30. ACK request (S-CSCF#2 to P-CSCF#2) ñ see example in table A.4.2-30

S-CSCF#1 forwards the ACK request to P-CSCF#2.

Table A.4.2-30: ACK request (S-CSCF#2 to P-CSCF#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
Route: <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

31. ACK request (P-CSCF#2 to UE#2) ñ see example in table A.4.2.31

P-CSCF#2 forwards the ACK request to the terminating UE.

Table A.4.2-31: ACK request (P-CSCF#2 to UE#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 66
From:
To:
Call-ID:
Cseq:
Content-Length:

```

32. MSRP SEND request (UE#1 to UE#2) ñ see example in table A.4.2-32

The originating UE sends the first message over the MSRP session with an MSRP SEND request using the established TCP connection.

Table A.4.2-32: MSRP SEND request (UE#1 to UE#2)

```

MSRP SEND
Boundary: d93kswow
To-path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167
From-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
TR-ID: 8822
Message-ID: 8822
Content-Type: "text/plain"

those are my principles. If you don't like them I have others - Groucho Marx.
-----d93kswow$

```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Content-Type:	The format of the body of the request.
Closing:	Same boundary string as well as Continuation-Flag

33. MSRP 200 (OK) response (UE#2 to UE#1) ñ see example in table A.4.2-33

The terminating UE acknowledges the reception of the MSRP SEND request with an MSRP 200 (OK) response using the established TCP connection.

Table A.4.2-33: MSRP 200 (OK) response (UE#2 to UE#1)

```
MSRP 200 OK
Boundary: 839s9ed
To-path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167
From-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
TR-ID: 8822
-----839s9ed$
```

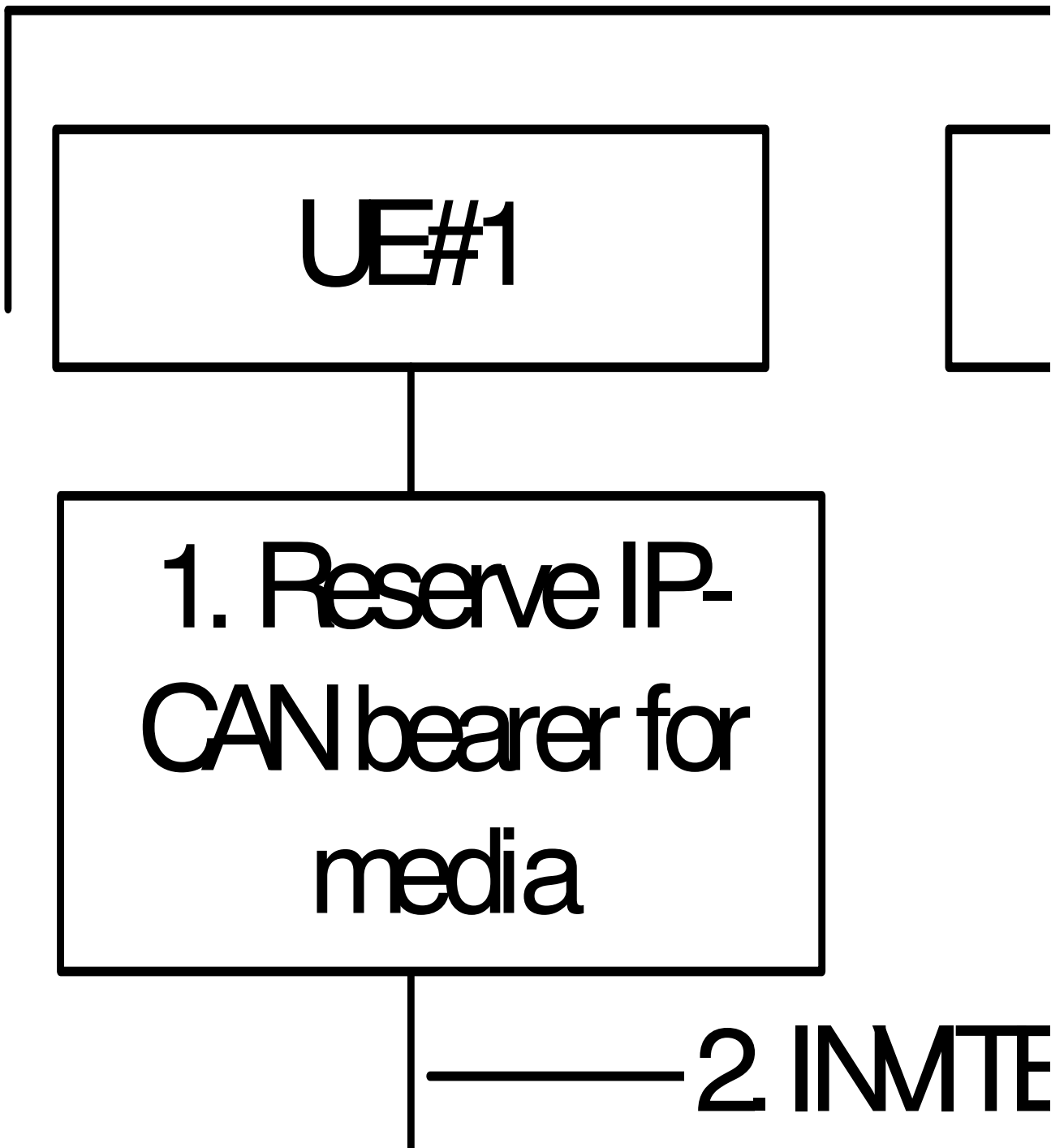
TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

A.4.3 Establishing a session for session-based messaging with Intermediate Nodes

Figure A.4.3-1 shows the establishment of a MSRP session between two users with intermediate nodes being added to the signalling path as well as the first message being sent over the established connection.

It is assumed that both the originating UE and terminating UE are using an IP-CAN with a separate bearer for SIP signalling which means that each UE needs to reserve a new IP-CAN bearer for the message session media component.

UE#1 Visited N



HE#1 Visited N

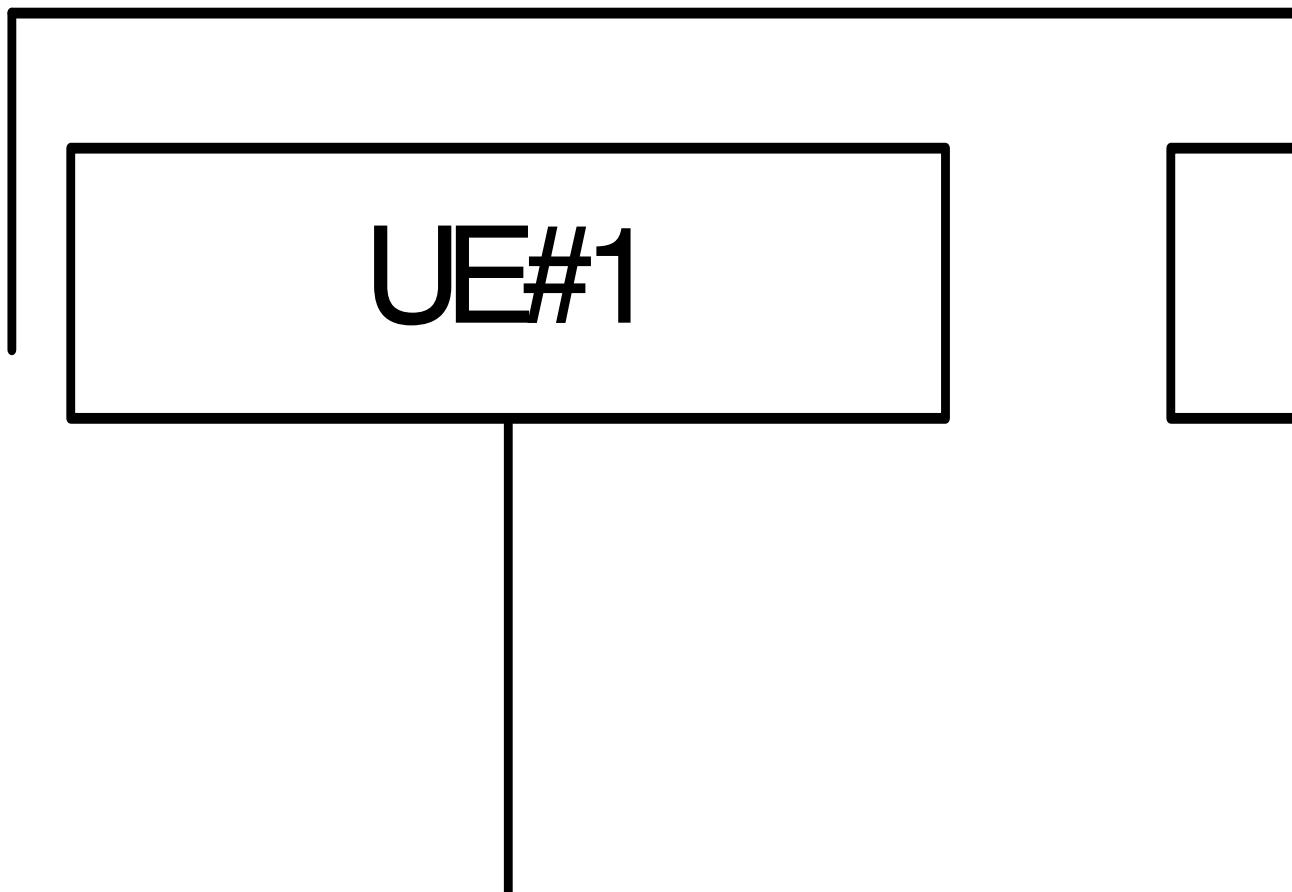


Figure A.4.3-1: Establishment of MSRP session with Intermediate Nodes

Editor's Note: It is FFS if the labelling of the intermediate nodes should be AS or AS/MRFC/MRFP.

The details of the signalling flows are as follows:

1. Reserve IP-CAN bearer for media

The originating UE#1 wants to initiate a session-based message session with the terminating UE#2. UE#1 reserves an IP-CAN bearer for the message session media component.

2. INVITE request (UE#1 to P-CSCF#1) - see example in table A.4.3-2

UE#1 creates a local MSRP URL, which can be used for the communication between the two user agents. It builds a SDP Offer containing the generated MSRP URL and assigns a local port number for the MSRP communication.

Table A.4.3-2: INVITE request (UE#1 to P-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:user2_public1@home2.net>
Call-ID: cb03a0s09a2sdfg1kj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi=87654321; port1=7531
Contact: <sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 my.msrp.dummy.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271

```

3. 100 (Trying) response (P-CSCF#1 to UE#1) - see example in table A.4.3-3

The P-CSCF responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.3-3: 100 (Trying) response (P-CSCF#1 to UE#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

4. INVITE request (P-CSCF#1 to S-CSCF#1) - see example in table A.4.3-4

The INVITE request is forwarded to the S-CSCF.

Table A.4.3-4: INVITE request (P-CSCF#1 to S-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

5. 100 (Trying) response (S-CSCF#1 to P-CSCF#1) - see example in table A.4.3-5

The S-CSCF responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.3-5: 100 (Trying) response (S-CSCF#1 to P-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

6. Evaluation of initial filter criterias

S-CSCF#1 validates the service profile of this subscriber and evaluates the initial filter criterias. For sip:user1_public1@home1.net S-CSCF#2 has origination initial filter criteria with service points of interest of Method = INVITE request and SDP m= 'message' and 'msrp' protocol that informs the S-CSCF to route the INVITE request to the AS sip:as1.home1.net.

7. INVITE request (S-CSCF#1 to AS#1) - see example in table A.4.3-7

S-CSCF#1 forwards the INVITE request to the AS#1.

Table A.4.3-7: INVITE request (S-CSCF#1 to AS#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Route: <sip:asl.home1.net;lr>, <sip:cb03a0s09a2sdfg1kj490333@scscf1.home1.net;lr>
Record-Route: <sip:orig@scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+1-212-555-1111>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
    ecf=[5555::1ff:2ee:3dd:4ee]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

8. 100 (Trying) response (AS#1 to S-CSCF#1) - see example in table A.4.3-8

AS#1 sends a 100 (Trying) response provisional response to S-CSCF#1.

Table A.4.3-8: 100 (Trying) response (AS#1 to S-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

9. TCP setup

AS#1 establishes a TCP connection using the IP-CAN bearers established in step 1 to the host address and port as specified in the MSRP URL received in the SDP Offer from the originating UE#1.

10. INVITE request (AS#1 to S-CSCF#1) - see example in table A.4.3-10

AS#1 sends a new INVITE request to the S-CSCF#1 with the session attribute containing a unique URL for the AS#1 to receive media on.

Table A.4.3-10: INVITE request (AS#1 to S-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 70
Route: <sip:cb03a0s09a2sdfglkj490333@scscf1.home1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+1-212-555-1111>
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=323551024"
Privacy: none
From: <sip:user1_public1@home1.net>; tag=234567
To: <sip:user2_public1@home2.net>
Call-ID: s09a233cbsdfglkj490303a0
Cseq: 278 INVITE
Contact: <sip:[7777::eee:ddd:ccc:aaa]>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933620 2987933620 IN IP6 7777::eee:ddd:ccc:aaa
s=-
c=IN IP6 as1.home1.net.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371

```

11. 100 (Trying) response (S-CSCF#1 to AS#1) - see example in table A.4.3-11

S-CSCF#1 sends a 100 (Trying) response provisional response to AS#1.

Table A.4.3-11: 100 (Trying) response (S-CSCF#1 to AS#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP as1.home1.net;branch=z9hG4bK240f34.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

12. INVITE request (S-CSCF#1 to I-CSCF#2) - see example in table A.4.3-12

S-CSCF#1 forwards the INVITE request to the I-CSCF#2. As the S-CSCF#1 does not know whether the I-CSCF at home2.net is a loose router or not, it does not introduce a Route header.

Table A.4.3-12: INVITE request (S-CSCF#1 to I-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 69
Record-Route: <sip:scscf1.home1.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=323551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

13. 100 (Trying) response (I-CSCF#2 to S-CSCF#1) - see example in table A.4.3-13

I-CSCF#2 sends a 100 (Trying) response provisional response to S-CSCF#1.

Table A.4.3-13: 100 (Trying) response (I-CSCF#1 to S-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

14. Cx: User Location Query procedure

The I-CSCF sends a query to the HSS to find out the S-CSCF of the called user. The HSS responds with the address of the current S-CSCF for the terminating subscriber.

15. INVITE request (I-CSCF#2 to S-CSCF#2) - see example in table A.4.3-15

I-CSCF#2 forwards the INVITE request to the S-CSCF#2 that will handle the session termination.

Table A.4.3-15: INVITE request (I-CSCF#2 to S-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 68
Route: <sip:scscf2.home2.net;lr>
Record-Route:
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

NOTE: The I-CSCF does not add itself to the Record-Route header, as it has no need to remain in the signalling path once the session is established.

16. 100 (Trying) response (S-CSCF#2 to I-CSCF#2) ñ see example in table A.4.3-16

S-CSCF#2 responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.3-16: 100 (Trying) response (S-CSCF#2 to I-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

17. Evaluation of initial filter criterias

S-CSCF#2 validates the service profile of this subscriber and evaluates the initial filter criterias. For sip:user2_public1@home2.net S-CSCF#2 has termination initial filter criteria with service points of interest of Method = INVITE request and SDP m = 'message' and 'msrp' protocol that informs the S-CSCF to route the INVITE request to the AS sip:as2.home2.net.

18. INVITE request (S-CSCF#2 to AS#2) ñ see example in table A.4.3-18

S-CSCF#2 forwards the INVITE request to AS#2

Table A.4.3-18: INVITE request (S-CSCF#2 to AS#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 67
Route: <sip:as2.home2.net;lr>, <sip:s09a233cbdsfglkj490303a0@scscf2.home2.net;lr>
Record-Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>
P-Asserted-Identity:
P-Charging-Vector:
P-Charging-Function-Addresses: ccf=[6666::b99:c88:d77:e66]; ccf=[6666::a55:b44:c33:d22];
    ecf=[6666::1ff:2ee:3dd:4ee]; ecf=[6666::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

19. 100 (Trying) response (AS#2 to S-CSCF#2) ñ see example in table A.4.3-19

S-CSCF#2 receives a 100 (Trying) response provisional response to the INVITE request.

Table A.4.3-19: 100 (Trying) response (AS#2 to S-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

20. TCP setup

AS#2 establishes a TCP connection to the host address and port as specified in the MSRP URL received in the SDP Offer from the AS#1.

21. INVITE request (AS#2 to S-CSCF#2) ñ see example in table A.4.3-21

AS#2 sends a new INVITE request to the S-CSCF#2 with the session attribute containing a unique URL for the AS#2 to receive media on.

Table A.4.3-21: INVITE request (AS#2 to S-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 70
Route: <sip:s09a233cbsdfg1kj490303a0@scscf2.home2.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+602Irt5tAFrbHLso=423551024"
Privacy: none
From: <sip:user1_public1@home1.net>; tag=7871654
To: <sip:user2_public1@home2.net>
Call-ID: 0s09g1kj4903a2sdf33cb03a
Cseq: 210 INVITE
Contact: <sip:[9999::ccc:aaa:bbb:ddd]>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933630 2987933630 IN IP6 9999::ccc:aaa:bbb:ddd
s=-
c=IN IP6 as2.home2.net.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121

```

22. 100 (Trying) response (S-CSCF#2 to AS#2) ñ see example in table A.4.3-22

S-CSCF#2 receives a 100 (Trying) response provisional response to the INVITE request.

Table A.4.3-22: 100 (Trying) response (S-CSCF#2 to AS#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP as2.home2.net;branch=z9hG4bK348923.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

23. INVITE request (S-CSCF#2 to P-CSCF#2) ñ see example in table A.4.3-23

S-CSCF#2 forwards the INVITE request, as determined by the termination procedure. S-CSCF#2 remembers (from the registration procedure) the UE Contact address and the next hop CSCF for this UE.

Table A.4.3-23: INVITE request (S-CSCF#2 to P-CSCF#2)

```

INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 69
Route: <sip:pcscf2.visited2.net;lr>
Record-Route: <sip:scscf2.home2.net;lr>
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
P-Called-Party-ID: <sip:user2_public1@home2.net>
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

24. 100 (Trying) response (P-CSCF#2 to S-CSCF#2) ñ see example in table A.4.3-24

S-CSCF#2 receives a 100 (Trying) response provisional response to the INVITE request.

Table A.4.3-24: 100 (Trying) response (P-CSCF#2 to S-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

25. INVITE request (P-CSCF#2 to UE#2) ñ see example in table A.4.3-25

P-CSCF#2 forwards the INVITE request to the terminating UE.

Table A.4.3-25: INVITE request (P-CSCF#2 to UE#2)

```

INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 68
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
P-Called-Party-ID:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

26. 100 (Trying) response (UE#2 to P-CSCF#2) ñ see example in table A.4.3-26

UE#2 sends a 100 (Trying) response provisional response to P-CSCF#2.

Table A.4.3-26: 100 (Trying) response (UE#2 to P-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
as2.home2.net;branch=z9hG4bK348923.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

27. Reserve IP-CAN bearer for media

The terminating UE#2 accepts the message session and. UE#2 reserves an IP-CAN bearer for the message session media component.

28. TCP setup

UE#2 establishes a TCP connection using the IP-CAN bearers established in step 27 to the host address and port as specified in the MSRP URL received in the SDP Offer from AS#2.

29. MSRP VISIT request (UE#2 to AS#2) ñ see example in table A.4.3-29

UE#2 sends a MSRP VISIT request to AS#2 using the established TCP connection.

Table A.4.3-29: MSRP VISIT request (UE#2 to AS#2)

```

MSRP VISIT
Boundary: 194sy2s
To-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121
From-path:msrp://[5555::eee:fff:aaa:bbb]:3335/s417121
TR-ID: 2810
Message-ID: 2810
-----194sy2s$

```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Closing:	Same boundary string as well as Continuation-Flag

30. MSRP VISIT request (AS#2 to AS#1) ñ see example in table A.4.3-30

AS#2 sends a MSRP VISIT request to AS#1 using the established TCP connection.

Table A.4.3-30: MSRP VISIT request (AS#2 to AS#1)

```
MSRP VISIT
Boundary: 948qa2q
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371
From-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122
TR-ID: 1730
Message-ID: 1730
-----948qa2q$
```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Closing:	Same boundary string as well as Continuation-Flag.

31. MSRP VISIT request (AS#1 to UE#1) ñ see example in table A.4.3-31

AS#1 sends a MSRP VISIT request to UE#1 using the established TCP connection.

Table A.4.3-31: MSRP VISIT request (AS#1 to UE#1)

```
MSRP VISIT
Boundary: i3hd83h
To-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
From-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
TR-ID: 1380
Message-ID: 1380
----- i3hd83h$
```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Closing:	Same boundary string as well as Continuation-Flag

32. MSRP 200 (OK) response (UE#1 to AS#1) ñ see example in table A.4.3-32

UE#1 that acts as a MSRP host returns a MSRP 200 (OK) response to the MSRP VISIT request using the established TCP connection.

Table A.4.3-32: MSRP 200 (OK) response (UE#1 to AS#1)

```
MSRP 200 OK
Boundary: 3hdk39f
To-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
From-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
TR-ID: 1380
-----3hdk39f$
```

TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

33. MSRP 200 (OK) response (AS#1 to AS#2) ñ see example in table A.4.3-33

AS#1 returns a MSRP 200 (OK) response the MSRP VISIT request to AS#2 using the established TCP connection.

Table A.4.3-33: MSRP 200 (OK) response (AS#1 to AS#2)

```
MSRP 200 OK
Boundary: 9sne41k
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371
From-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122
TR-ID: 1730
-----9sne41k$
```

TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

34. MSRP 200 (OK) response (AS#2 to UE#2) ñ see example in table A.4.3-34

AS#2 returns a MSRP 200 (OK) response to the MSRP VISIT request to UE#2 using the established TCP connection.

Table A.4.3-34: MSRP 200 (OK) response (AS#2 to UE#2)

```
MSRP (...) 200 OK
Boundary: skjf93j
To:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121
From:[5555::eee:fff:aaa:bbb]:3335/s417121
TR-ID: 2810
-----skjf93j$
```

TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

35. 200 (OK) response (UE#2 to P-CSCF#2) ñ see example in table A.4.3-35

After the receipt of the MSRP 200 (OK) response to the MSRP VISIT request, the terminating UE#2 sends a 200 (OK) response for the INVITE request containing SDP that indicates that UE#2 has successfully visited AS#2.

Table A.4.3-35: 200 (OK) response (UE#2 to P-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
    scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>
Privacy: none
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>;tag=7871654
To: <sip:user2_public1@home2.net>;tag=999456
Call-ID: 0s09g1kj4903a2sdf33cb03a
Cseq: 210 INVITE
Contact: <sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 29879336302987933630IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 my.MSRP.dummy.URL
t=0 0
m=message 9999 msrp *
a=accept-types:text/plain text/html message/cpim
a=path:msrp://[5555::eee:fff:aaa:bbb]:3335/s417121

```

36. 200 (OK) response (P-CSCF#2 to S-CSCF#2) ñ see example in table A.4.3-36

P-CSCF#2 forwards the 200 (OK) response to S-CSCF#2.

Table A.4.3-36: 200 (OK) response (P-CSCF#2 to S-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=423551024"
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

37. 200 (OK) response (S-CSCF#2 to AS#2) ñ see example in table A.4.3-37

S-CSCF#2 forwards the 200 (OK) response to AS#2.

Table A.4.3-37: 200 (OK) response (S-CSCF#2 to AS#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP as2.home2.net;branch=z9hG4bK348923.1
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=423551024"; orig-ioi=home1.net;
term-ioi=home2.net
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

38. ACK request (AS#2 to S-CSCF#2) ñ see example in table A.4.3-38

AS#2 generates a new ACK request and sends it to S-CSCF#2.

Table A.4.3-38: ACK request (AS#2 to S-CSCF#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 70
Route: <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From: <sip:user1_public1@home1.net>;tag=7871654
To: <sip:user2_public1@home2.net>;tag=2217770
Call-ID: 0s09g1kj4903a2sdf33cb03a
Cseq: 210 ACK
Content-Length: 0

```

39. ACK request (S-CSCF#2 to P-CSCF#2) ñ see example in table A.4.3-39

S-CSCF#1 forwards the ACK request to P-CSCF#2.

Table A.4.3-39: ACK request (S-CSCF#2 to P-CSCF#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 69
Route: <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

40. ACK request (P-CSCF#2 to UE#2) ñ see example in table A.4.3.40

P-CSCF#2 forwards the ACK request to UE#2.

Table A.4.3-40: ACK request (P-CSCF#2 to UE#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pscsf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
    scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:

```

41. 200 (OK) response (AS#2 to S-CSCF#2) ñ see example in table A.4.3-41

AS#2 generates a 200 (OK) response to S-CSCF#2.

Table A.4.3-41: 200 (OK) response (AS#2 to S-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Record-Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"
From: <sip:user1_public1@home1.net>;tag=234567
To: <sip:user2_public1@home2.net>;tag=98989823
Call-ID: s09a233cbsdfglkj490303a0
CSeq: 278 INVITE
Contact: <sip:[9999::ccc:aaa:bbb:ddd]>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933640 2987933640 IN IP6 9999::ccc:aaa:bbb:ddd
s=-
c=IN IP6 as2.home2.net.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a= path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122

```

42. 200 (OK) response (S-CSCF#2 to I-CSCF#2) ñ see example in table A.4.3-42

S-CSCF#2 forwards the 200 (OK) response to I-CSCF#2.

Table A.4.3-42: 200 (OK) response (S-CSCF#2 to I-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
Privacy:
P-Charging-Vector: icid-value"AyretyU0dm+602IrT5tAFrbHLso=323551024"; orig-ioi=home1.net;
    term-ioi=home2.net
P-Charging-Function-Addresses: ccf=[6666::b99:c88:d77:e66]; ccf=[6666::a55:b44:c33:d22];
    ecf=[6666::1ff:2ee:3dd:4ee]; ecf=[6666::6aa:7bb:8cc:9dd]
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

43. 200 (OK) response (I-CSCF#2 to S-CSCF#1) ñ see example in table A.4.3-43

I-CSCF#2 forwards the 200 (OK) response to S-CSCF#1.

Table A.4.3-43: 200 (OK) response (I-CSCF#2 to S-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Record-Route:
P-Asserted-Identity:
Privacy: none
P-Charging-Vector:
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

44. 200 (OK) response (S-CSCF#1 to AS#1) ñ see example in table A.4.3-44

S-CSCF#1 forwards the 200 (OK) response to AS#1.

Table A.4.3-44: 200 (OK) response (S-CSCF#1 to AS#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP as1.home1.net;branch=z9hG4bK240f34.1
Record-Route:
P-Asserted-Identity:
Privacy:
P-Charging-Vector:
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
    ecf=[5555::1ff:2ee:3dd:4ee]; ecf=[5555::6aa:7bb:8cc:9dd]
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

45. ACK request (AS#1 to S-CSCF#1) - see example in table A.4.3-45

AS#1 generates an ACK request and sends it to S-CSCF#1.

Table A.4.3-45: ACK request (AS#1 to S-CSCF#1)

```

ACK sip:[9999::ccc:aaa:bbb:ddd] SIP/2.0
Via: SIP/2.0/UDP as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 70
Route: <sip:scscf1.home1.net;lr>, <sip:scscf2.home2.net;lr>
From: <sip:user1_public1@home1.net>; tag=234567
To: <sip:user2_public1@home2.net>; tag=98989823
Call-ID: s09a233cbsdfglkj490303a0
Cseq: 278 ACK
Content-Length: 0

```

46. ACK request (S-CSCF#1 to S-CSCF#2) - see example in table A.4.3-46

The S-CSCF#1 forwards the ACK request to S-CSCF#2.

Table A.4.3-46: ACK request (S-CSCF#1 to S-CSCF#2)

```

ACK sip:[9999::ccc:aaa:bbb:ddd] SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP as1.home1.net;branch=
    z9hG4bK240f34.1
Max-Forwards: 69
Route: <sip:scscf2.home2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

47. ACK request (S-CSCF#2 to AS#2) - see example in table A.4.3-47

The S-CSCF#2 forwards the ACK request to the AS#2.

Table A.4.3-47: ACK request (S-CSCF#2 to AS#2)

```

ACK sip:[9999::ccc:aaa:bbb:ddd] SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:

```

48. 200 (OK) response (AS#1 to S-CSCF#1) ñ see example in table A.4.3-48

AS#1 generates a 200 (OK) response and sends it to S-CSCF#1.

Table A.4.3-48: 200 (OK) response (AS#1 to S-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"
From: <sip:user1_public1@home1.net>;tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfg1kj490333
CSeq: 127 INVITE
Contact: <sip:[7777::eee:ddd:ccc:aaa]>
Allow:
Content-Type:
Content-Length:

v=0
o=- 2987933642 2987933642 IN IP6 7777::eee:ddd:ccc:aaa
s=-
c=IN IP6 as1.home1.net.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372

```

49. 200 (OK) response (S-CSCF#1 to P-CSCF#1) ñ see example in table A.4.3-49

S-CSCF#1 forwards the 200 (OK) response to P-CSCF#1.

Table A.4.3-49: 200 (OK) response (S-CSCF#1 to P-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

50. 200 (OK) response (P-CSCF#1 to UE#1) ñ see example in table A.4.3-50

P-CSCF#1 forwards the 200 (OK) response to UE#1

Table A.4.3-50: 200 (OK) response (P-CSCF#1 to UE#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

51. ACK request (UE#1 to P-CSCF#1) ñ see example in table A.4.3-51

The UE responds to the 200 (OK) response with an ACK request sent to the P-CSCF#1.

Table A.4.3-51: ACK request (UE#1 to P-CSCF#1)

```

ACK sip:[7777::eee:ddd:ccc:aaa] SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
From: <sip:user1_public1@home1.net>;tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfg1kj490333
Cseq: 127 ACK
Content-Length: 0

```

52. ACK request (P-CSCF#1 to S-CSCF#1) ñ see example in table A.4.3-52

The P-CSCF#1 forwards the ACK request to the S-CSCF#1.

Table A.4.3-52: ACK request (P-CSCF#1 to S-CSCF#1)

```

ACK sip:[7777::eee:ddd:ccc:aaa] SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

53. ACK request (S-CSCF#1 to AS#1) - see example in table A.4.3-53

The S-CSCF#1 forwards the ACK request to AS#1.

Table A.4.3-53: ACK request (S-CSCF#1 to AS#1)

```

ACK sip:[7777::eee:ddd:ccc:aaa] SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:

```

54. MSRP SEND (UE#1 to AS#1) ñ see example in table A.4.3-54

The originating UE sends the first message over the MSRP session with a MSRP SEND request using the established TCP connection.

Table A.4.3-54: MSRP SEND (UE#1 to AS#1)

```

MSRP SEND
Boundary: 34kjf94
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
From-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
TR-ID: 8822
Message-ID: 8822
Content-Type: "text/plain"

I will never be a member of a club that accepts people like me as members - Groucho Marx.
-----34kjf94$

```

Boundary: Boundary string used to terminate message.

To-path:	The sender's remote path.
From-path:	The sender's local URL.
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Content-Type:	The format of the body of the request.
Closing:	Same boundary string as well as Continuation-Flag.

55. MSRP SEND (AS#1 to AS#2) ñ see example in table A.4.3-55

AS#1 forwards the first MSRP SEND request to AS#2 over the MSRP session using the established TCP connection.

Table A.4.3-55: MSRP SEND (AS#1 to AS#2)

```
MSRP SEND
Boundary: shfsoi3
To-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122
From-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371
TR-ID: 2832
Message-ID: 2832
Content-Type: "text/plain"

I will never be a member of a club that accepts people like me as members - Groucho Marx.
-----shfsoi3$
```

Boundary:	Boundary string used to terminate message.
To-path:	The sender's remote path.
From-path:	The sender's local URL.
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Content-Type:	The format of the body of the request.
Closing:	Same boundary string as well as Continuation-Flag.

56. MSRP SEND (AS#2 to UE#2) ñ see example in table A.4.3-56

AS#2 forwards the first MSRP SEND request to UE#2 over the MSRP session using the established TCP connection.

Table A.4.3-56: MSRP SEND (AS#2 to UE#2)

```
MSRP SEND
Boundary: 2oid4sf
To-path:msrp://[5555::eee:fff:aaa:bbb]:3335/s417121
From-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121
TR-ID: 3311
Message-ID: 3311
Content-Type: "text/plain"

I will never be a member of a club that accepts people like me as members - Groucho Marx.
-----2oid4sf$
```

Boundary:	Boundary string used to terminate message.
To-path:	The sender's remote path.
From-path:	The sender's local URL.

- TR-ID:** A unique transaction ID for this MSRP transaction.
- Message-ID:** A unique message ID for MSRP message.
- Content-Type:** The format of the body of the request.
- Closing:** Same boundary string as well as Continuation-Flag.

57. MSRP 200 (OK) response (UE#2 to AS#2) ñ see example in table A.4.3-57

The receiving UE#2 acknowledges the reception of the MSRP SEND request with a MSRP 200 (OK) response sent using the established TCP connection.

Table A.4.3-57: MSRP 200 (OK) response (UE#2 to AS#2)

```
MSRP 200 OK
Boundary: 2j32ri3
To-path:msrp://[5555::eee:fff:aaa:bbb]:3335/s417121
From-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121
TR-ID: 3311
-----2j32ri3$
```

- TR-ID:** The transaction ID for this MSRP transaction, as received in the related MSRP request.

58. MSRP 200 (OK) response (AS#2 to AS#1) ñ see example in table A.4.3-58

AS#2 acknowledges the reception of the MSRP SEND request with a MSRP 200 (OK) response to AS#1 using the established TCP connection.

Table A.4.3-58: MSRP 200 (OK) response (AS#2 to AS#1)

```
MSRP 200 OK
Boundary: wnhus9o
To-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122
From-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371
TR-ID: 2832
-----wnhus9o$
```

- TR-ID:** The transaction ID for this MSRP transaction, as received in the related MSRP request.

59. MSRP 200 (OK) response (AS#1 to UE#1) ñ see example in table A.4.3-59

AS#1 acknowledges the reception of the MSRP SEND request with a MSRP 200 (OK) response to UE#1 sent using the established TCP connection.

Table A.4.3-59: MSRP 200 (OK) response (AS#1 to UE#1)

```
MSRP 200 OK
Boundary: 3is09wh
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
TR-ID: 8822
-----3is09wh$
```

- TR-ID:** The transaction ID for this MSRP transaction, as received in the related MSRP request.

A.4.4 Establishing a session for session-based messaging with preconditions

This signalling flow is not provided as it is the same as the session establishment flows with preconditions in 3GPP TS 24.228 [4] except that the SDP contents are for setting up MSRP sessions over TCP rather than RTP sessions over UDP.

A.5 Flows demonstrating session-based messaging conferences

Annex C (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2003-06					Version 0.0.1: Initial version for discussion		0.0.1
2003-06	CN#31				Version 0.0.2: Title and text changed in order to reflect that Messaging is a service.	N1-031123	N1-031281
2003-09					Version 0.1.0: Title changed	0.0.2	0.1.0
2003-12					Version 0.2.0: Incorporated the following CRs as approved at CN#32 meeting: N1-031676: Message Sessions in IMS ñ Call Flow N1-031677: Immediate Messaging ñ Call Flow reference to 24.228 N1-031722: Message Sessions in IMS ñ Text (created Annex B) N1-031723: Immediate Messaging ñ Text Additionally the editor took the freedom to change the heading formats in subclause B.5. Also the title <void> of subclause B.5 was replaced with the title of clause 5 in the main part of the text and subclauses B.5.1 and B.5.2 were added (both <void>).	0.1.0	0.2.0
2003-12					Version 0.2.1: Including minor issues that were left out by mistake when creating version 0.2.0	0.2.0	0.2.1
2004-01					Version 0.3.0: Incorporated the following CRs as approved at CN#32bis meeting: N1-040151 ñ Message Session in IMS N1-040189 ñ Deletion of imported and unused Definitions N1-040197 ñ UE to UE message session flow N1-040198 ñ Message Session Initiation ñ mobile originating case N1-040199 ñ Message Session Initiation ñ mobile terminating case N1-040200 ñ Use of MESSAGE versus MSRP	0.2.1	0.3.0
2004-01					Version 0.3.1: Including N1-040200, that was left out (although listed) by mistake when creating version 0.3.0	0.3.0	0.3.1
2004-02					Version 0.4.0: Incorporated the following CRs as approved at CN1#33 meeting: - N1-040261 ñ Update of Scope - N1-040262 ñ Correction of Flows - N1-040280 ñ Editorial Changes - N1-040306 ñ Corrections to Annex A.4.3 - N1-040307 ñ Corrections to Annex B - N1-040426 ñ SDP for session-based messaging - N1-040429 ñ Corrections to Annex A.1 ñ A.4.2 - N1-040486 ñ Definition of MSRP Role for AS and MRFP - N1-040488 ñ Session-based Messaging with Intermediate Node Flow A.4.3	0.3.1	0.4.0
2004-02					Version 0.4.1: Added subclause 9.2.2, which was missing from last update. Minor editorials	0.4.0	0.4.1
2004-04					Version 0.5.0: Incorporated the following CRs as approved as CN1#33bis meeting: - N1-040561 ñ MSRP in AS - N1-040648 ñ Editorial changes to Annex A - N1-040738 ñ MSRP terminating UE hosting flow as well as minor editorial changes	0.4.1	0.5.0
2004-05					Version 1.0.0: Incorporated the following CRs as approved during CN1#34 meeting: - N1-041038 ñ Shifting Material from Annex B to main body - N1-041036 ñ Corrections to Message Sessions Flows - N1-041040 ñ Ut for Messaging - N1-040850 ñ Correction of signalling flow example - N1-041037 ñ Establishing a session with active intermediate nodes, with originating UE hosting, and without SBLP - N1-041039 ñ Addition of Note to 5.3.1.1 - several smaller editorial changes Note: the material was first shifted from Annex B to the main body (approved CR in N1-041038), all CRs that were written against material in Annex B were afterwards applied against the material in the main body.	0.5.0	1.0.0
2004-05					Version 1.0.1 produced to correct smaller editorial mistakes.	1.0.0	1.0.1
2004-06					Version 1.1.0 produced as outcome of CN#34bis meeting in Helsinki, Finland. Todc N1-041172 (Changes in MSRP) and	1.0.1	1.1.0

				smaller editorial changes incorporated.		
2004-08				Version 1.2.0 produced as outcome CN#35 meeting in Sophia Antipolis, France. Tdoc N1-041585 (AS section) and smaller editorial changes incorporated.	1.1.0	1.2.0
2004-11				Version 6.0.0 produces as outcome of CN#36 meeting in Seoul, South Korea. The following documents were incorporated: N1-041714 ñ deletion of intro claus N1-041716 ñ Terminology alignment N1-041989 ñ Data Manipulation for IMS Messaging in Rel-6 N1-041995 ñ Session establishment for session-mode messaging N1-041996 ñ Session-based messaging conferences N1-041997 ñ subclause 8 rework N1-041998 ñ general subclause in participant section N1-041999 ñ subclause 9 rework N1-042001 ñ Participant in immediate messaging N1-042114 ñ subclause 10 rework N1-042115 ñ subclause 6 rework	1.2.0	2.0.0

3GPP TS 24.247 v21.02.0 (2004-12108)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Core Network;
Messaging service using the IP Multimedia (IM) Core Network
(CN) subsystem;
Stage 3
(Release 6)**



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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

~~Editor's note: No material proposed for this optional informative clause.~~

1 Scope

The present document provides the protocol details for the messaging service within the IP Multimedia CN Subsystem (IMS) based on the Session Initiation Protocol (SIP), the Session Description Protocol (SDP), the Message Session Relay Protocol (MSRP) and [the Conference Policy Control Protocol \(CPCP\)](#)~~other protocols~~. The document covers immediate messaging, session-based messaging and session-based messaging conferences, [as described in TS 22.340](#).

~~Editor's note: This TS will also include information on Data Manipulation / Group Management (see clause 10).~~

~~Editor's note: The "other protocols" that are mentioned here need to be listed in detail, in order to replace the phrase "other protocols". This TS only covers protocols in the scope of CN1.~~

~~Editor's note: The work on Ut interface / data manipulation is related to the work under the work item for IMS group management, WID-11036, and the decision is to be made on contributed text as in which document it will appear.~~

~~Editor's note: The work on session-based messaging conferences is related to the work under the work item for IMS conferencing, WID-11039, and the decision is to be made on contributed text as in which document it will appear.~~

Where possible the present document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of SIP, SDP, MSRP and other protocols, either directly, or as modified by 3GPP TS 24.229.

The present document is applicable to Application Servers (ASs), Media Resource Function Controllers (MRFCs), Media Resource Function Processors (MRFPs) and to User Equipment (UE) providing messaging capabilities.

This document does not cover the signalling between a MRFC and a MRFP.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

~~1)~~• References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

~~2)~~• For a specific reference, subsequent revisions do not apply.

~~3)~~• For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "3G Vocabulary".
- [2] 3GPP TS 22.228: "Service requirements for the Internet Protocol (IP) multimedia core network subsystem; Stage 1".
- [3] 3GPP TS 23.218: "IP Multimedia (IM) Session Handling; IP Multimedia (IM) call model; Stage 2".
- [4] 3GPP TS 24.228: "Signalling flows for the IP multimedia call control based on SIP and SDP; Stage 3".
- [5] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP; Stage 3".
- [6] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [7] RFC 3261 (March 2002): "SIP: Session Initiation Protocol".
- [8] RFC 3428 (December 2002): "Session Initiation Protocol (SIP) Extension for Instant Messaging".

[9] draft-ietf-simple-message-sessions-06.txt (May 2004): "The Message Session Relay Protocol".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[10] [3GPP TS 24.147: "Conferencing using the IP Multimedia \(IM\) Core Network \(CN\) subsystem; Stage 3"](#).

[11] [3GPP TS 22.340: "IP Multimedia System \(IMS\) messaging; Stage 1i"](#).

3 Definitions, symbols and abbreviations

3.1 Definitions

[For the purposes of the present document, the following terms and definitions given in TS 22.340 \[11\] apply:](#)

[Immediate messaging](#)

[Session based messaging](#)

[Session based messaging conferences](#)

For the purposes of the present document, the [following] terms and definitions given in draft-ietf-simple-message-sessions [9] apply:

Host

[Page-mode messaging](#)

Session inactivity timer

[Session-mode messaging](#)

[Session-mode messaging conferences](#)

Visitor

Editor's note: This subclause contains elements from subclause 3.1 of 3GPP TR 29.847.

[For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.147 \[10\] apply:](#)

[Conferencing Application Server](#)

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

Editor's note: This subclause will also contains elements from subclause 3.2 of 3GPP TR 29.847. The abbreviations below are those used in this document already.

AS	Application Server
CN	Core Network
DM	Data manipulator
DMS	Data manipulation server
IM	IP Multimedia
IMS	IP Multimedia CN subsystem
IP	Internet Protocol
MRFC	Media Resource Function Controllers
MRFP	Media Resource Function Processors
MSRP	Message Session Relay Protocol
SBLP	Service Based Local Policy
SDP	Session Description Protocol
SIP	Session Initiation Protocol
UE	User Equipment

URL Uniform Resource Locator

4 Messaging overview

~~Editor's note: Reference to Stage1 for Group Management needs to be introduced.~~

The basic services for the IP Multimedia core network Subsystem (IMS), as defined in 3GPP TS 24.229 [5], allow a user to initiate, modify and terminate media sessions using the Session Initiation Protocol, as defined in RFC 3261 [7]. Although these basic mechanisms already allow the exchange of instant messaging information using SIP, this functionality can be extended to provide a richer service within the IMS.

The messaging service within the IM CN subsystem provides the means for a user to send or receive single messages immediately to / from another user and to create and participate in a messaging conference with one or more other users. Participants to such message based communication may be internal or external to the home network.

When to use an immediate message and when to use a session-based messaging session will depend on the application.

NOTE: Some participants may always use session-based messaging, while others may use immediate messaging or a combination of session-based messaging and immediate messaging dependant of the characteristics of the messaging session. The criteria are implementation and application specific.

~~Editors note: Further recommendations for the use of immediate messaging versus session-based messaging are FFS.~~

~~The user may address a message to a dedicated list, so that the message is sent to all participants that are listed therein. Such lists can be created and manipulated by the user.~~

~~The network operator or the user may apply policies which block messages that are originated by certain users or from dedicated domains.~~

For immediate messaging the procedures for page-mode messaging, as defined in RFC 3428 or for session-mode messaging, as defined in draft-ietf-simple-message-sessions are utilized. When to use an page-mode messaging and when to use session-mode messaging session for the purpose of immediate messaging will depend on the application.

For session-based messaging and session-based messaging conferences, the Message Session Relay Protocol (MSRP) is utilized to transport messages.

The architecture for the 3GPP messaging is specified in 3GPP TS 23.228 [6] and 3GPP TS 23.218 [3].

5 Protocol using SIP for ~~immediate~~ page-mode messaging

5.1 Introduction

5.2 Functional entities

5.2.1 User Equipment (UE)

For the purpose of ~~immediate~~ page-mode messaging, the UE shall implement the role of a Participant as described in subclause 5.3.1.

5.2.2 Application Server (AS)

For the purpose of ~~immediate~~ page-mode messaging, an Application Server may implement the role of a List Server as described in subclause 5.3.2. An Application Server may implement the role of a Participant as described in subclause 5.3.1

5.3 Role

5.3.1 Participant

5.3.1.1 General

For the purpose of page-mode messaging a participant will send a page-mode message using a SIP MESSAGE request as defined in RFC 3428 [8] to another participant.

Editor's Note: The term "participant" is e.g. used in RFC 3428, although it is not defined therein. It might be that this term is replaced by a more suitable definition in the future.

5.3.1.2~~1~~ Sending of an immediate message

When sending an immediate page-mode message to another participant, the participant shall construct and send a MESSAGE request in accordance with RFC 3428 [8] and subclause 5.1.2A.1 of 3GPP TS 24.229 [5].

5.3.1.3~~2~~ Receiving an immediate message

Upon receipt of a MESSAGE request, the participant shall perform the procedures as described in RFC 3428 [8] and subclause 5.1.2A.2 of 3GPP TS 24.229 [5].

NOTE: A MESSAGE request can be used for applications other than immediate messaging (e.g. 3GPP TS 23.228 [6] subclause 5.4.9), and the handling of received MESSAGE requests for such applications is outside the scope of this specification.

~~5.3.2 List Server~~

6 Protocol using SIP for session-~~based~~mode messaging

6.1 Introduction

6.2 Functional entities

6.2.1 User Equipment (UE)

For the purpose of session-~~based~~mode messaging, the UE shall implement the role of a Participant as described in subclause 6.3.1.

6.3 Role

6.3.1 Participant

6.3.1.1 General

The participant shall perform SIP related session procedures in accordance with 3GPP TS 24.229 [5] to set up the dialog used for session-based messaging.

Editor's Note: The term "participant" is e.g. used in RFC 3428, although it is not defined therein. It might be that this term is replaced by a more suitable definition in the future.

6.3.1.2 Session initiation - mobile originating case

When the originating participant wishes to engage the terminating participant ~~an endpoint~~ in a session-mode message session, it ~~will~~ shall use the call initiation procedure specified in TS 24.229 [5], ~~send an initial INVITE request to the endpoint. The participant may select to initiate a message session either:~~ The Request URI header shall include the URI of the terminating participant.

- ~~a) without requiring or indicating support for the precondition and reliable provisional responses extensions; or~~
- ~~b) requiring the precondition and reliable provisional responses extensions.~~

~~The procedures are specified in 3GPP TS 24.229 [5].~~

~~If the participant selects to establish a message session without requiring or indicating support for the precondition and reliable provisional responses extensions, it shall not include the "precondition" and "100rel" option tags in the Require and Supported header fields in the initial INVITE request. The originating participant shall use an already established IP-CAN bearer that will be used for media, or it can establish an IP-CAN bearer that will be used for media, prior to sending the initial INVITE request as specified in the draft-ietf-simple-message-sessions [9].~~

~~Editor's note: It needs further clarification which kind of already established IP-CAN bearer can be used.~~

~~Editor's note: The applicability of SBLP to Session-based Messaging is FFS and is awaiting a stage 2 decision. The currently agreed text in this subclause does not allow SBLP to be used for the mobile originating case.~~

6.3.1.3 Session initiation - mobile terminating case

When the terminating participant receives an initial INVITE request from the originating endpoint proposing a message session, the terminating participant shall apply the procedures as specified in 3GPP TS 24.229 [5], ~~the initial INVITE request may indicate that~~

- ~~a) the precondition and reliable provisional responses extensions are neither required nor support;~~
- ~~b) the precondition and reliable provisional responses extensions are required; or~~
- ~~c) the precondition and reliable provisional responses extensions are support but not required.~~

~~If the initial INVITE request does not include the "precondition" and "100rel" option tags in the Require and Supported header fields, indicating that the originating endpoint neither requires nor supports the precondition and reliable provisional responses extensions, the terminating participant shall proceed as specified in the draft-ietf-simple-message-sessions [9]. When opening a TCP connection, the terminating participant shall either establish new IP-CAN bearer that will be used for media or use an already established IP-CAN bearer.~~

~~Editor's note: It needs further clarification which kind of already established IP-CAN bearer can be used.~~

~~When reserving the resources for the IP-CAN bearer that will be used for media, the participant shall, if the media-authorization token was received in the initial INVITE request, process the media-authorization token as specified for the IP-CAN (e.g. according to Annex B of 3GPP TS 24.229 [5] in case of GPRS).~~

~~NOTE:—When reserving the IP-CAN bearer that will be used for media, the terminating participant may specify the bandwidth if it was specified in the received SDP offer and the bandwidth that it may specify in the SDP answer.~~

6.3.2 Intermediate Node

6.3.2.1 General

The intermediate node shall act as a Routing B2BUA as specified in subclause 5.7 in TS 24.229 [5].

6.3.2.2 Generic procedures for all methods at the intermediate node

6.3.2.2.1 Intermediate node ñ originating case

The intermediate node shall follow the procedures of 3GPP TS 24.229 [5] subclause 5.7.3 when acting as an originating UA.

6.3.2.2.2 Intermediate node ñ terminating case

Upon receipt of an initial request the intermediate node shall follow the procedures of 3GPP TS 24.229 [5] subclause 5.7.1.2 in relation to the contents of the P-Charging-Function-Addresses header and the P-Charging-Vector header.

When creating the first response for this initial request, the intermediate node shall:

- 1) include the P-Charging-Vector header including:
 - a) the value of the icid parameter as received in the initial request; and
 - b) the value of the orig-ioi parameter as received in the initial request; and
 - c) the term-ioi parameter, indicating the network of the intermediate node; and
- 2) include the P-Charging-Function-Addresses header as received in the initial request or, if the P-Charging-Function-Addresses header was not received in the initial request indicate the values applicable for the conference in the P-Charging-Function-Addresses header.

When creating responses for an initial INVITE request, the intermediate node shall additionally send the 200 (OK) response to the initial INVITE request only after the resource reservation has been completed.

6.3.2.3 Session Initiation

6.3.2.3.1 Session initiation ñ originating case

The intermediate node shall follow the procedures of 3GPP TS 24.229 [5] at call initiation.

The intermediate node shall populate the INVITE as specified for a Routing B2BUA with the following clarification:

- a) the Request URI to the URI as in the received Request URI;
- b) the To header to the same display name and URI as in the received To header;
- c) the From header sent includes the same display name and URI as in the From header in the received INVITE; and
- d) the P-Asserted-Identity header and privacy includes the same information as in the received P-Asserted-Identity header and Privacy header; and

If the intermediate node is not able to establish a TCP connection for the MSRP session the intermediate node shall send BYE towards the participant and release the associated resources.

6.3.2.3.2 Session initiation ñ terminating case

Upon receipt of an INVITE request that includes an the terminating participant URI in the request URI, the intermediate node shall:

- 1) verify the identity of the user as described in subclause 5.7.1.4 of 3GPP TS 24.229 [5] and authorize the request as described in subclause 5.7.1.5 of 3GPP TS 24.229 [5]. The following actions in this subclause shall only be performed if the request can be authorized; and
- 2) establish the session in accordance with TS 24.229 [5].
- 3) create a 200 (OK) response.

~~6.3.2.2 Session initiation – AS transiting case~~

The intermediate node shall populate the INVITE as specified for a Routing B2BUA with the following clarification:

- ~~— the From header sent in the outgoing INVITE includes the same display name and URI as in the From header in the received INVITE; and~~
- ~~— the P-Asserted-Identity header sent in the outgoing INVITE includes the same information as in the P-Asserted-Identity header in the received INVITE.~~

If the intermediate node is not able to establish a TCP connection for the MSRP session the intermediate node shall send BYE towards the participant and release the associated resources.

7 Protocol using SIP for session-based mode messaging conferences

~~Editor's Note: — This section is coupled with conferencing procedures as described in TS 24.147.~~

7.1 Introduction

Void.

7.2 Functional entities

7.2.1 User Equipment (UE)

For the purpose of session-based mode messaging conferences, the UE shall implement the role of a Participant as described in subclause 6.3.1 and the the procedures described in subclause 5.2.1 in 3GPP TS 24.147 [10].

7.2.2 Media Resource Function Controller (MRFC)

For the purpose of session-based messaging conferences, the MRFC shall follow the procedures described in subclause 5.2.2 in 3GPP TS 24.147 [10].

7.2.3 Conferencing Application Server (AS)

For the purpose of session-based messaging conferences, the AS shall follow the procedures described in subclause 5.2.3 in 3GPP TS 24.147 [10].

~~7.3 Role~~

~~7.3.1 Participant~~

~~Editor's Note: — The term "participant" is e.g. used in RFC 3428, although it is not defined therein. It might be that this term is replaced by a more suitable definition in the future.~~

8 Protocol using SDP for session-~~based-mode~~ messaging and session-~~based-mode~~ messaging conferences

8.1 Introduction

8.2 Functional entities

8.2.1 User Equipment (UE)

For the purpose of session-~~based-mode~~ messaging and session-~~based-mode~~ messaging conferences, the UE shall implement the role of

- an SDP offerer as described in [subclause 8.3.1](#)~~draft-ietf-simple-message-sessions [9]~~; and
- an SDP answerer as described in [subclause 8.3.2](#)~~draft-ietf-simple-message-sessions [9]~~.

8.2.2 Media Resource Function Controller (MRFC)

As the function split between the MRFC and the AS is out of scope of the present document, the procedures for the MRFC are described together with those for the AS in subclause 8.2.3.

~~For the purpose of session-based messaging and session-based messaging conferences, the MRFC shall implement the role of~~

- ~~—an SDP offerer as described in draft-ietf-simple-message-sessions [9]; and~~
- ~~—an SDP answerer as described in draft-ietf-simple-message-sessions [9].~~

8.2.3 Application Server (AS)

~~For the purpose of an AS acting either as:~~

- ~~—an endpoint for session-based messaging;~~
- ~~—an intermediate node for session-based messaging; or~~
- ~~—session-based messaging conferences;~~

As the functional split between the AS and the MRFC is out of scope of the present document, the procedures are described for a combined AS and MRFC. The AS and MRFC may either be collocated, or interoperate using a proprietary protocol and a proprietary functional split.

The AS shall implement the role of

- an intermediate node as described in subclause 8.3.3 when engaged in a session mode messaging conference; or
- a SDP offerer, as described in subclause 8.3.1, and a SDP answerer, as described in subclause 8.3.2 when engaged in a session mode session between a SDP offerer and SDP answerer. ~~—an SDP offerer as described in draft-ietf-simple-message-sessions [9]; and~~
- ~~—an SDP answerer as described in draft-ietf-simple-message-sessions [9].~~

NOTE: An AS, not performing one of the above specific functionalities, that is on the signalling path for the related SIP signalling, is not mandated to terminate the related MSRP.

8.3 Role

8.3.1 SDP offerer

When an SDP offerer wants to create a session mode messaging session, the SDP offerer shall populate the SDP as specified in subclause 6.1 in TS 24.229[5]. SDP offerer shall also include:

- a) a media attribute in accordance with draft-ietf-simple-message-sessions [9]; and
- b) the supported MIME types in the accept-types or accept-wrapped-types attributes in accordance with draft-ietf-simple-message-sessions [9]; and
- c) the address of the SDP offerer in the path attribute, in accordance with draft-ietf-simple-message-sessions [9].

The SDP may also include a max-size attribute. The attribute shall be formatted in accordance with draft-ietf simple-message-sessions [9]

At the receipt of the SDP answer the SDP offerer shall set up a TCP connection (if not already available) when an IP-CAN bearer with sufficient QoS is available.

8.3.2 SDP answerer

When receiving an SDP offer the SDP answerer shall populate the SDP answer as specified in subclause 6.1 in TS 24.229[5]. In addition the answerer shall include:

- a) a media attribute in accordance with the received media attribute in the SDP offer; and
- b) the supported MIME types in the accept-types or accept-wrapped-types attributes in accordance with draft-ietf-simple-message-sessions [9]; and
- c) the MSRP URI of the SDP answerer in the path attribute in accordance with draft-ietf-simple-message-sessions [9].

The SDP may also include a max-size attribute. The attribute shall be formatted in accordance with draft-ietf simple-message-sessions [9].

8.3.3 Intermediate node

8.3.3.1 Intermediate node Originating case

8.3.3.1.1 Sending of a SDP offer

The intermediate node shall create a SDP offer, which shall include:

- a) a media attribute in accordance with the media attribute received in the received in the SDP offer.; and
- b) the supported MIME types in the accept-types or accept-wrapped-types attributes as provisioned in the intermediate node. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9]; and
- c) a MSRP URI of the Intermediate node in the path attribute to be used when the SDP answerer wants to send a MSRP message to the conference. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

The SDP may also include a max-size attribute. The attribute shall be formatted in accordance with draft-ietf simple-message-sessions [9].

At the receipt of the SDP answer the Intermediate node shall set up a TCP connection (if not already available) when an IP-CAN bearer with sufficient QoS is available.

8.3.3.2 Intermediate node Terminating case

8.3.3.2.1 Sending of a SDP answer

The intermediate node shall at the receipt of a SDP offer create a SDP answer. The SDP answer shall include:

- a) a media attribute in accordance with the received media attribute in the SDP offer; and
- b) the supported MIME types in the accept-types or accept-wrapped-types attributes in accordance with draft-ietf-simple-message-sessions [9]; and
- c) a MSRP URI in the path attribute to be used when the SDP answerer shall send a MSRP message to the conference.. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

The SDP may also include a max-size attribute. The attribute shall be formatted in accordance with draft-ietf-simple-message-sessions [9].

9 Protocol using MSRP for session-~~based~~-mode messaging and session-~~based~~-mode messaging conferences

9.1 Introduction

9.2 Functional entities

9.2.1 User Equipment (UE)

9.2.1.1 General

The UE shall:

- ~~— implement the role of an MSRP host as described in draft-ietf-simple-message-sessions [9];~~
- ~~— implement the role of an MSRP visitor as described in draft-ietf-simple-message-sessions [9];~~
- implement the role of an MSRP sender as described in ~~draft-ietf-simple-message-sessions [9]~~ [subclause 9.3.1](#); and
- implement the role of an MSRP receiver as described in ~~draft-ietf-simple-message-sessions [9]~~ [subclause 9.3.2](#).

9.2.2 Application Server (AS)

As the functional split between the AS and the MRFP is out of scope of the present document, the procedures are described for a combined messaging conferencing AS and MRFP. The AS and MRFP may either be collocated, or interoperate using a proprietary protocol and a proprietary functional split.

For the purpose of an AS acting either as:

- an endpoint for session-~~based~~-mode messaging;
- an intermediate node for session-~~based~~-mode messaging; or
- a conferencing AS for session-~~based~~-mode messaging conferences,

the AS shall implement the role of:

- an intermediate node as described in subclause 9.3.3 when engaged in a session mode messaging conference; or
- a MSRP sender, as described in subclause 9.3.1, and a MSRP receiver, as described in subclause 9.3.2 when engaged in a session mode session between a MSRP sender and MSRP receiver.
- ~~—an MSRP host as described in draft-ietf-simple-message-sessions [9];~~
- ~~—an MSRP visitor as described in draft-ietf-simple-message-sessions [9];~~
- ~~—an MSRP sender as described in draft-ietf-simple-message-sessions [9]; and~~
- ~~—an MSRP receiver as described in draft-ietf-simple-message-sessions [9].~~

NOTE: An AS, not performing one of the above specific functionalities, that is on the signalling path for the related SIP signalling, is not mandated to terminate the related MSRP.

9.2.3 Media Resource Function Processor (MRFP)

As the function split between the MRFP and the conferencing AS is out of scope of the present document, the procedures for the MRFP are described together with those for the AS in subclause 9.2.2.

~~The MRFP shall:~~

- ~~—implement the role of an MSRP host as described in draft-ietf-simple-message-sessions [9];~~
- ~~—implement the role of an MSRP visitor as described in draft-ietf-simple-message-sessions [9];~~
- ~~—implement the role of an MSRP sender as described in draft-ietf-simple-message-sessions [9]; and~~
- ~~—implement the role of an MSRP receiver as described in draft-ietf-simple-message-sessions [9].~~

9.3 Role

9.3.1 MSRP sender

9.3.1.1 MSRP sender sends a message

When a MSRP sender wishes to send a message, the MSRP sender shall ensure that the message length is not longer than the max-size attribute, as received in a SDP offer or a SDP answer. Depending on the message length the message may be included in one SEND request or chunked into a number of SEND requests. The MSRP sender shall follow the procedures and rules as specified in draft-ietf-simple-message-sessions [9], when the MSRP sender fragments a message into a number SEND requests.

The MSRP sender shall create a SEND request in accordance with draft-ietf-simple-message-sessions [9], where the value of To-Path is the MSRP URI shall be set to value of path attribute received in a SDP offer or a SDP answer..

9.3.2 MSRP receiver

When a MSRP receiver receives a SEND request, the MSRP receiver shall parse the SEND request. The MSRP receiver shall either send a response including:

- a) a 200 (OK) status-code, as specified in draft-ietf-simple-message-sessions [9], for the concerned SEND message if the parsing was successful; or
- b) an appropriate status-code, as specified in draft-ietf-simple-message-sessions [9], for the concerned SEND message if the parsing was unsuccessful.

The MSRP receiver shall send a REPORT request if this is explicit or implicit requested in the SEND request(s) belonging to the message. It shall either be:

- a) a successful REPORT request including status-code 200 (OK) if a complete message is received and the Report-Success header in the SEND request was set to `!yes!`; or

- b) an unsuccessful REPORT request including status-code other than 200 (OK) as defined in draft-ietf-simple-message-sessions [9] if the MSRP receiver can conclude that a complete message is not received and the Report-Failure header is set to 'yes' or not included. The criteria to conclude that a complete message is not received are specified in draft-ietf-simple-message-sessions [9].

9.3.3 Intermediate node

9.3.3.1 Intermediate node terminating case

When an intermediate node receives a SEND request, the intermediate node shall:

- 1) parse the SEND request and either send a response including:
 - a) a 200 (OK) status-code, as specified in draft-ietf-simple-message-sessions [9], for the concerned SEND message, if the parsing was successful; or
 - b) an appropriate status-code, as specified in draft-ietf-simple-message-sessions [9], for the concerned SEND message if the parsing was unsuccessful.; and
- 2) determine that a complete message has been received. The following actions in this subclause shall only be performed if a complete message is received.

The MSRP receiver shall send a REPORT request if this is explicit or implicit requested in the SEND request(s) associated to the same message. It shall either be:

- a) a successful REPORT request including status-code 200 (OK) if the intermediate node concludes that all available users on the distribution list has received the complete message or a concerned user has received the complete message and the Report-Success header in the SEND request was set to 'yes'; or
- b) an unsuccessful REPORT request including status-code other than 200 (OK) as defined in draft-ietf-simple-message-sessions [9] if the intermediate node conclude that a complete message has not been received or that a complete message has not been able to be delivered to all available users on the distribution list or to a particular member of the distribution list.

9.3.3.2 Intermediate node originating case

When an intermediate node wishes to send a message, the intermediate shall ensure that the message length is not longer than the max-size attribute, as received in a SDP offer or a SDP answer. Depending on the message length the message may be included in one SEND request or chunked into a number of SEND requests. The intermediate shall follow the procedures and rules as specified in draft-ietf-simple-message-sessions [9], when the intermediate node fragments a message into a number SEND requests.

The intermediate shall create a SEND request in accordance with draft-ietf-simple-message-sessions [9] with the following clarifications:

- 1) set the Report-Success header as received in the SEND request;
- 2) set the Report-Failure header as received in the SEND request; and
- 3) depending on the received MSRP URI
 - a) either send the SEND request to all available user of the conference; or
 - b) send the SEND request to one MSRP receiver.

10 Protocol for data manipulation at the Ut reference point

~~Editor's Note: This subclause handles the procedures for generation of recipient lists (similar to Presence Lists)~~

~~Editor's Note: This subclause handles the procedures for blocking of messages from certain senders / domains.~~

~~Editor's Note: This subclause handles the procedures for generating "Message treatment" policies by the user.~~

~~Editor's Note: The usage of the Conference Policy Control Protocol for session-based messaging conferences is described in 3GPP TS 24.147.~~

~~Editor's Note: It has to be indicated which functionality described in this section applies to immediate messaging and which to session-based messaging (sessions).~~

10.1 Introduction

10.2 Functional entities

10.2.1 User Equipment (UE)

For the purpose of SIP based conferences, the UE may implement the role of a XCAP client as described in subclause 10.3.1.

The UE shall implement HTTP digest AKA (see RFC 3310 [X]) and it shall initiate a bootstrapping procedure with the bootstrapping server function located in the home network, as described in 3GPP TS 24.109 [YY].

The UE shall acquire the subscriber's certificate from PKI portal by using a bootstrapping procedure, as described in 3GPP TS 24.109 [YY].

The UE shall implement Transport Layer Security (TLS) (see RFC 2246 [Y]). The UE shall be able to authenticate the authentication proxy based on the received certificate during TLS handshaking phase.

10.2.2 Media Resource Function Controller (MRFC)

As the function split between the MRFC and the AS is out of scope of the present document, the procedures for the MRFC are described together with those for the AS in subclause 10.2.3.

~~The UE shall implement the role of a Data manipulator as described in subclause B.10.3.1.~~

10.2.3~~2~~ Application Server (AS)

The AS shall implement the role of a ~~Data manipulation~~XCAP server as described in subclause ~~B.10.3.2~~. As the function split between the AS and the MRFC is out of scope of the present document, only the procedures are described for a combined AS and MRFC. The AS and MRFC may either be collocated, or interoperate using a proprietary protocol and a proprietary functional split.

For the purpose of SIP-based conferences, the AS/MRFC shall act as a XCAP Server, as described in subclause 10.3.2.

The AS/MRFC may implement the role of a privileged user as described in subclause 7.3.1.

If there is no authentication proxy in the network, then the AS/MRFC shall:

- implement the role of a network application function, as described in 3GPP TS 24.109 [YY];
- support HTTP digest authentication and certificate authentication; and
- implement TLS (see RFC 2246 [Y]).

Editor's Note: It needs to be clarified what physical entities can contain the Authentication Proxy and its relationship with the IMS architecture. Documentation for the case of a separate authentication proxy may need to be provided.

10.3 Role

10.3.1 ~~XCAP client~~**Data Manipulator (DM)**

A XCAP client shall support the manipulation of some or all of the conferencing policy data elements that are defined in draft-ietf-xcon-cpcp-xcap [Z]. The XCAP client shall comply with the requirement as specified for a privileged user role in subclause 5.3.1 in TS 24.147 [10].

Editor's note: It needs to be studied whether the procedures described in TS 24.147 for Conference Policy Control cover all requirements of data manipulation for session-based messaging conferences and therefore whether significant material will appear in this subclause.

10.3.2 ~~Data Manipulation Server (DMS)~~**XCAP Server**

The XCAP server shall comply with the requirement as specified for a conference policy server role in subclause 5.3.1 in TS 24.147 [10].

Editor's note: It needs to be studied whether the procedures described in TS 24.147 for Conference Policy Control cover all requirements of data manipulation for session-based messaging conferences and therefore whether significant material will appear in this subclause.

Annex A (informative): Example signalling flows of messaging service operation

A.1 Scope of signalling flows

This annex gives examples of signalling flows for conferencing within the IP Multimedia CN Subsystem (IMS) based on the Session Initiation Protocol (SIP), SIP Events, the Session Description Protocol (SDP) and other protocols.

These signalling flows provide detailed signalling flows, which expand on the overview information flows provided in 3GPP TS 23.228 [6].

A.2 Introduction

A.2.1 General

A.2.2 Key required to interpret signalling flows

The key to interpret signalling flows specified in 3GPP TS 24.228 [4] subclause 4.1 applies with the additions specified below.

In order to differentiate between messages for SIP and MSRP, the following notation is used:

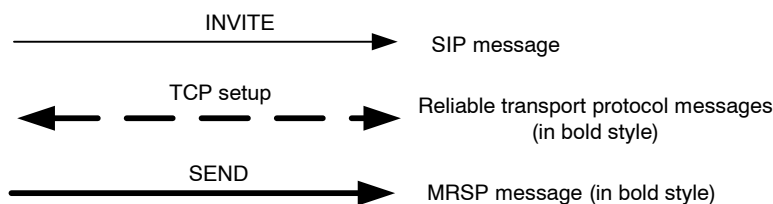


Figure A.2.2-1: Signalling flow notation

A.3 Signalling flows demonstrating immediate messaging

The signalling flow for immediate messaging is shown in subclause 10.6 of 3GPP TS 24.228 [4].

A.4 Signalling flows demonstrating session-based messaging

A.4.1 Introduction

This subclause provides signalling flows for session-based messaging, established both with and without preconditions.

How the signalling flow for session-based messaging looks like depends on the following:

- a) at what point in time the IP-CAN for the media component (MSRP) is set up; or
- b) whether preconditions and reliable provisional responses are used or not.

A.4.2 Establishing a session for session-based messaging without preconditions

Figure A.4.2-1 shows the establishment of an MSRP session between two users without the usage of preconditions and reliable provisional responses as well as the first message being sent over the established connection.

It is assumed that both the originating UE and terminating UE are using an IP-CAN with a separate bearer for SIP signalling which means that each UE needs to reserve a new IP-CAN bearer for the message session media component prior to sending the first MSRP message.

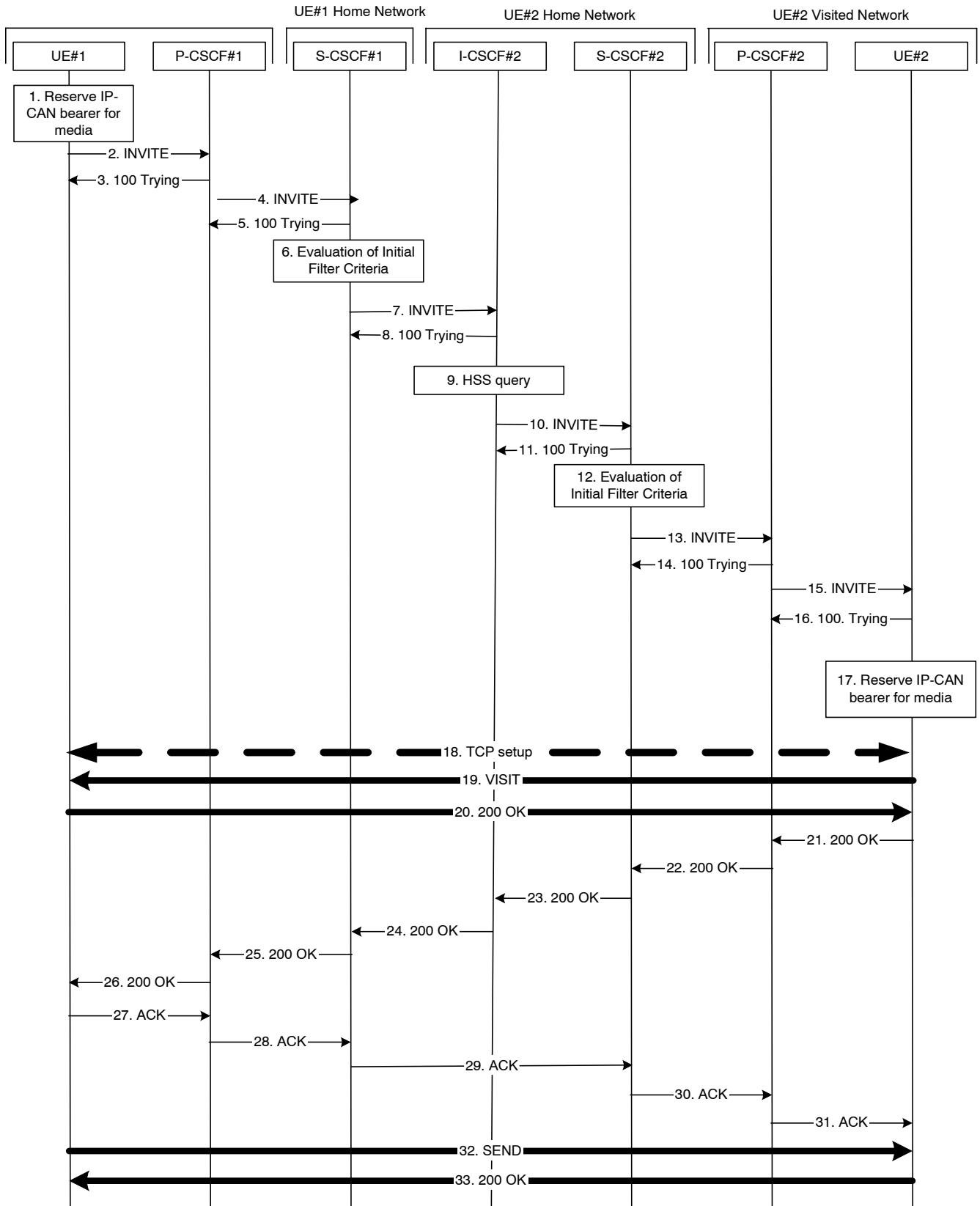


Figure A.4.2-1: Establishment of MSRP session

The details of the signalling flows are as follows:

1. Reserve IP-CAN bearer for media

The originating UE wants to initiate a session-based message session with the terminating UE. The originating UE reserves an IP-CAN bearer for the message session media component.

2. INVITE request (UE#1 to P-CSCF#1) - see example in table A.4.2-2

The originating UE creates a local MSRP URL, which can be used for the communication between the two user agents. It builds a SDP Offer containing the generated MSRP URL and assigns a local port number for the MSRP communication.

Table A.4.2-2: INVITE request (UE#1 to P-CSCF#1)

```
INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:user2_public1@home2.net>
Call-ID: cb03a0s09a2sdfg1kj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
port-c=8642; port-s=7531
Contact: <sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 my.msrp.dummy.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
```

3. 100 (Trying) response (P-CSCF#1 to UE#1) - see example in table A.4.2-3

The P-CSCF responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.2-3: 100 (Trying) response (P-CSCF#1 to UE#1)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

4. INVITE request (P-CSCF#1 to S-CSCF#1) - see example in table A.4.2-4

The INVITE request is forwarded to the S-CSCF.

Table A.4.2-4: INVITE request (P-CSCF#1 to S-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

```

```

v=
o=
s=
c=
t=
m=
a=
a=

```

5. 100 (Trying) response (S-CSCF#1 to P-CSCF#1) - see example in table A.4.2-5

The S-CSCF responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.2-5: 100 (Trying) response (S-CSCF#1 to P-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

6. Evaluation of initial filter criteria

S-CSCF#1 validates the service profile of this subscriber and evaluates the initial filter criterias.

7. INVITE request (S-CSCF#1 to I-CSCF#2) - see example in table A.41-7

S-CSCF#1 forwards the INVITE request to the I-CSCF#2.

Table A.4.2-7: INVITE request (S-CSCF#1 to I-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+1-212-555-1111>
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

8. 100 (Trying) response (I-CSCF#2 to S-CSCF#1) - see example in table A.4.2-8

I-CSCF#2 sends a 100 (Trying) response provisional response to S-CSCF#1.

Table A.4.2-8: 100 (Trying) response (I-CSCF#2 to S-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

9. Cx: User Location Query procedure

The I-CSCF sends a query to the HSS to find out the S-CSCF of the called user. The HSS responds with the address of the current S-CSCF for the terminating subscriber.

10. INVITE request (I-CSCF#2 to S-CSCF#2) ñ see example in table A.4.2-10

I-CSCF#2 forwards the INVITE request to the S-CSCF#2 that will handle the session termination.

Table A.4.2-10: INVITE request (I-CSCF#2 to S-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
Route: <sip:scscf2.home2.net;lr>
Record-Route:
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

11. 100 (Trying) response (S-CSCF#2 to I-CSCF#2) ñ see example in table A.4.2-11

S-CSCF#2 responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.2-11: 100 (Trying) response (S-CSCF#2 to I-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

12. Evaluation of initial filter criterias

S-CSCF#2 validates the service profile of this subscriber and evaluates the initial filter criterias.

13. INVITE request (S-CSCF#2 to P-CSCF#2) ñ see example in table A.4.2-13

S-CSCF#2 forwards the INVITE request, as determined by the termination procedure. S-CSCF#2 remembers (from the registration procedure) the UE Contact address and the next hop CSCF for this UE.

Table A.4.2-13: INVITE request (S-CSCF#2 to P-CSCF#2)

```

INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 66
Route: <sip:pcscf2.visited2.net;lr>
Record-Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>,
    <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
P-Called-Party-ID: <sip:user2_public1@home2.net>
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

14. 100 (Trying) response (P-CSCF#2 to S-CSCF#2) ñ see example in table A.4.2-14

S-CSCF#2 receives a 100 (Trying) response provisional response to the INVITE request.

Table A.4.2-14: 100 (Trying) response (P-CSCF#2 to S-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

15. INVITE request (P-CSCF#2 to UE#2) ñ see example in table A.4.2-15

P-CSCF#2 forwards the INVITE request to the terminating UE.

Table A.4.2-15: INVITE request (P-CSCF#2 to UE#2)

```

INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 65
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>,
<sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
P-Called-Party-ID:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

16. 100 (Trying) response (UE#2 to P-CSCF#2) ñ see example in table A.4.2-16

The terminating UE sends a 100 (Trying) response provisional response to P-CSCF#2.

Table A.4.2-16: 100 (Trying) response (UE#2 to P-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

17. Reserve IP-CAN bearer for media

The terminating UE accepts the message session. The terminating UE reserves an IP-CAN bearer for the message session media component.

18. TCP setup

The terminating UE establishes a TCP connection using the IP-CAN bearers established in step 1 and step 17 to the host address and the port as specified in the MSRP URL received in the SDP Offer from the originating UE.

19. MSRP VISIT request (UE#1 to UE#2) ñ see example in table A.4.2-19

The terminating UE sends an MSRP VISIT request using the established TCP connection.

Table A.4.2-19: MSRP VISIT request (UE to UE)

```

MSRP VISIT
Boundary: dkei38sd
To-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
From-path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167
TR-ID: 2810
Message-ID: 2810
-----dkei38sd$

```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Closing:	Same boundary string as well as Continuation-Flag

20. MSRP 200 (OK) response (UE#2 to UE#1) ñ see example in table A.4.2-20

The originating UE that acts as an MSRP host returns an MSRP 200 (OK) response to the MSRP VISIT request using the established TCP connection.

Table A.4.2-20: 200 (OK) response (UE#2 to UE#1)

```

MSRP 200 OK
Boundary: wej28su
To-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
From-path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167
TR-ID: 2810
-----wej28su$

```

TR-ID:	The transaction ID for this MSRP transaction, as received in the related MSRP request.
---------------	--

21. 200 (OK) response (UE#2 to P-CSCF#2) ñ see example in table A.4.2-21

After the receipt of the the MSRP 200 (OK) response to the MSRP VISIT request, the terminating UE sends a 200 (OK) response for the INVITE request containing SDP that indicates that the terminating UE has successfully visited to the originating UE.

Table A.4.2-21: 200 (OK) response (UE#2 to P-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>>, <sip:scscf2.home2.net;lr>,
<sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
Privacy: none
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:user2_public1@home2.net>; tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Contact: <sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933617 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 my.MSRP.dummy.URL
t=0 0
m=message 9999 msrp *
a=accept-types:text/plain text/html message/cpim
a=path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167

```

22. 200 (OK) response (P-CSCF#2 to S-CSCF#2) ñ see example in table A.4.2-22

P-CSCF#2 forwards the 200 (OK) response to S-CSCF#2.

Table A.4.2-22: 200 (OK) response (P-CSCF#2 to S-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity: John Smith" <sip:user2_public1@home2.net>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

23. 200 (OK) response (S-CSCF#2 to I-CSCF#2) ñ see example in table A.4.2-23

S-CSCF#2 forwards the 200 (OK) response to I-CSCF#2.

Table A.4.2-23: 200 (OK) response (S-CSCF#2 to I-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
    term-ioi=home2.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
    ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

24. 200 (OK) response (I-CSCF#2 to S-CSCF#1) ñ see example in table A.4.2-24

I-CSCF#2 forwards the 200 (OK) response to S-CSCF#1.

Table A.4.2-24: 200 (OK) response (I-CSCF#2 to S-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
Privacy: none
P-Charging-Vector:
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

25. 200 (OK) response (S-CSCF#1 to P-CSCF#1) ñ see example in table A.4.2-25

S-CSCF#1 forwards the 200 (OK) response to P-CSCF#1.

Table A.4.2-25: 200 (OK) response (S-CSCF#1 to P-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

26. 200 (OK) response (P-CSCF#1 to UE#1) ñ see example in table A.4.2-26

P-CSCF#1 forwards the 200 (OK) response to the originating UE.

Table A.4.2-26: 200 (OK) response (P-CSCF#1 to UE#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:pcscf2.visited2.net;lr>, <sip:scscf2.home2.net;lr>,
    <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

27. ACK request (UE#1 to P-CSCF#1) ñ see example in table A.4.2-27

The UE responds to the 200 (OK) response with an ACK request sent to the P-CSCF#1.

Table A.4.2-27: ACK request (UE#1 to P-CSCF#1)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>,
      <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From: <sip:user1_public1@home1.net>;tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 ACK
Content-Length: 0

```

28. ACK request (P-CSCF#1 to S-CSCF#1) ñ see example in table A.4.2-28

The P-CSCF#1 forwards the ACK request to S-CSCF#1.

Table A.4.2-28: ACK request (P-CSCF#1 to S-CSCF#1)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
      [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>, <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

29. ACK request (S-CSCF#1 to S-CSCF#2) - see example in table A.4.2-29

The S-CSCF#1 forwards the ACK request to the the S-CSCF#2.

Table A.4.2-29: ACK request (S-CSCF#1 to S-CSCF#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
      pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
      [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Route: <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

30. ACK request (S-CSCF#2 to P-CSCF#2) ñ see example in table A.4.2-30

S-CSCF#1 forwards the ACK request to P-CSCF#2.

Table A.4.2-30: ACK request (S-CSCF#2 to P-CSCF#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
Route: <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

31. ACK request (P-CSCF#2 to UE#2) ñ see example in table A.4.2.31

P-CSCF#2 forwards the ACK request to the terminating UE.

Table A.4.2-31: ACK request (P-CSCF#2 to UE#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
    scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 66
From:
To:
Call-ID:
Cseq:
Content-Length:

```

32. MSRP SEND request (UE#1 to UE#2) ñ see example in table A.4.2-32

The originating UE sends the first message over the MSRP session with an MSRP SEND request using the established TCP connection.

Table A.4.2-32: MSRP SEND request (UE#1 to UE#2)

```

MSRP SEND
Boundary: d93kswow
To-path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167
From-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
TR-ID: 8822
Message-ID: 8822
Content-Type: "text/plain"

those are my principles. If you don't like them I have others - Groucho Marx.
-----d93kswow$

```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Content-Type:	The format of the body of the request.
Closing:	Same boundary string as well as Continuation-Flag

33. MSRP 200 (OK) response (UE#2 to UE#1) ñ see example in table A.4.2-33

The terminating UE acknowledges the reception of the MSRP SEND request with an MSRP 200 (OK) response using the established TCP connection.

Table A.4.2-33: MSRP 200 (OK) response (UE#2 to UE#1)

```
MSRP 200 OK
Boundary: 839s9ed
To-path:msrp://[5555::eee:fff:aaa:bbb]:3333/s234167
From-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
TR-ID: 8822
-----839s9ed$
```

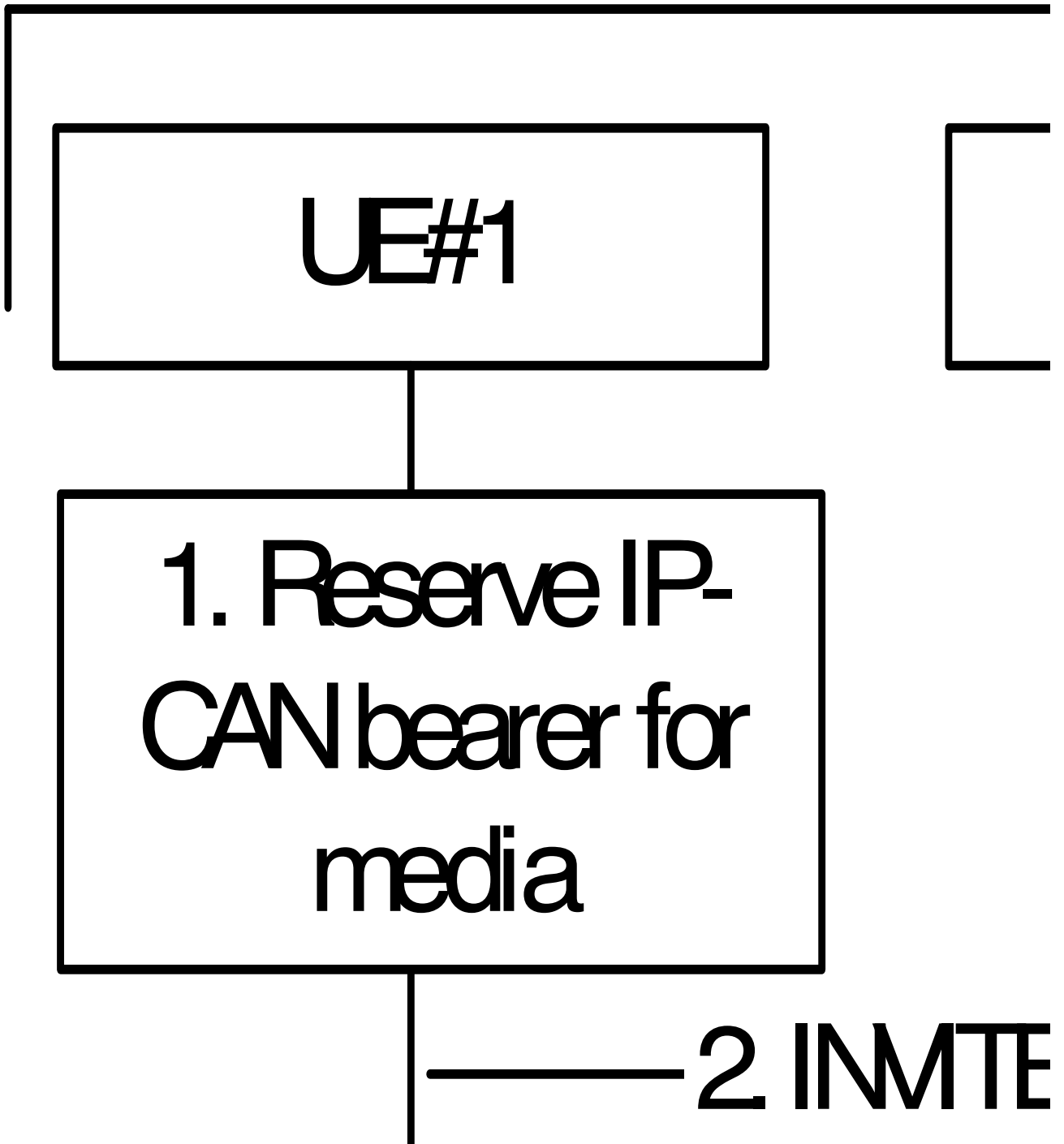
TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

A.4.3 Establishing a session for session-based messaging with Intermediate Nodes

Figure A.4.3-1 shows the establishment of a MSRP session between two users with intermediate nodes being added to the signalling path as well as the first message being sent over the established connection.

It is assumed that both the originating UE and terminating UE are using an IP-CAN with a separate bearer for SIP signalling which means that each UE needs to reserve a new IP-CAN bearer for the message session media component.

UE#1 Visited N



HE#1 Visited N

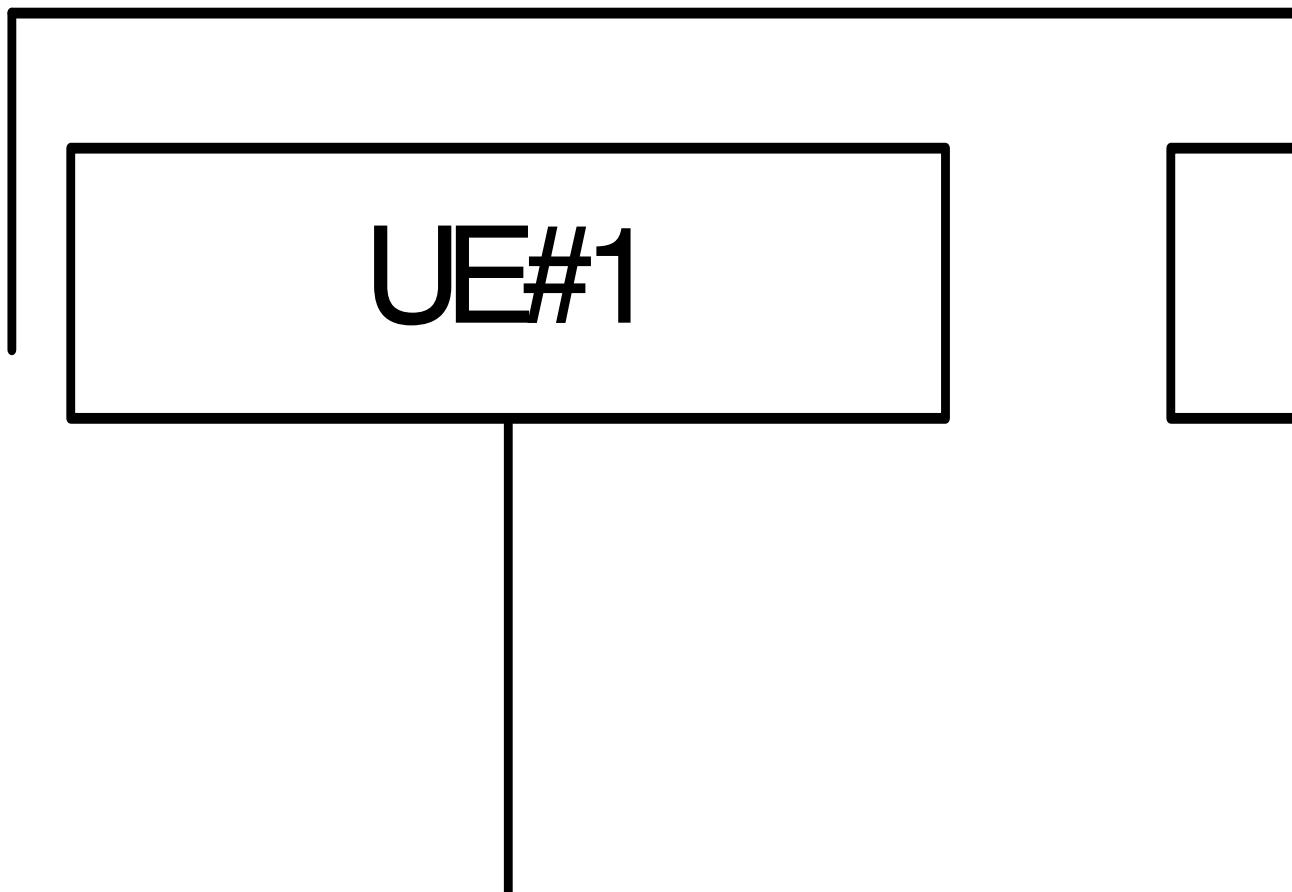


Figure A.4.3-1: Establishment of MSRP session with Intermediate Nodes

Editor's Note: It is FFS if the labelling of the intermediate nodes should be AS or AS/MRFC/MRFP.

The details of the signalling flows are as follows:

1. Reserve IP-CAN bearer for media

The originating UE#1 wants to initiate a session-based message session with the terminating UE#2. UE#1 reserves an IP-CAN bearer for the message session media component.

2. INVITE request (UE#1 to P-CSCF#1) - see example in table A.4.3-2

UE#1 creates a local MSRP URL, which can be used for the communication between the two user agents. It builds a SDP Offer containing the generated MSRP URL and assigns a local port number for the MSRP communication.

Table A.4.3-2: INVITE request (UE#1 to P-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:user2_public1@home2.net>
Call-ID: cb03a0s09a2sdfg1kj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi=87654321; port1=7531
Contact: <sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 my.msrp.dummy.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271

```

3. 100 (Trying) response (P-CSCF#1 to UE#1) - see example in table A.4.3-3

The P-CSCF responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.3-3: 100 (Trying) response (P-CSCF#1 to UE#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

4. INVITE request (P-CSCF#1 to S-CSCF#1) - see example in table A.4.3-4

The INVITE request is forwarded to the S-CSCF.

Table A.4.3-4: INVITE request (P-CSCF#1 to S-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

5. 100 (Trying) response (S-CSCF#1 to P-CSCF#1) - see example in table A.4.3-5

The S-CSCF responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.3-5: 100 (Trying) response (S-CSCF#1 to P-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

6. Evaluation of initial filter criterias

S-CSCF#1 validates the service profile of this subscriber and evaluates the initial filter criterias. For sip:user1_public1@home1.net S-CSCF#2 has origination initial filter criteria with service points of interest of Method = INVITE request and SDP m= 'message' and 'msrp' protocol that informs the S-CSCF to route the INVITE request to the AS sip:as1.home1.net.

7. INVITE request (S-CSCF#1 to AS#1) - see example in table A.4.3-7

S-CSCF#1 forwards the INVITE request to the AS#1.

Table A.4.3-7: INVITE request (S-CSCF#1 to AS#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Route: <sip:asl.home1.net;lr>, <sip:cb03a0s09a2sdfg1kj490333@scscf1.home1.net;lr>
Record-Route: <sip:orig@scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+1-212-555-1111>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
    ecf=[5555::1ff:2ee:3dd:4ee]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

8. 100 (Trying) response (AS#1 to S-CSCF#1) - see example in table A.4.3-8

AS#1 sends a 100 (Trying) response provisional response to S-CSCF#1.

Table A.4.3-8: 100 (Trying) response (AS#1 to S-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

9. TCP setup

AS#1 establishes a TCP connection using the IP-CAN bearers established in step 1 to the host address and port as specified in the MSRP URL received in the SDP Offer from the originating UE#1.

10. INVITE request (AS#1 to S-CSCF#1) - see example in table A.4.3-10

AS#1 sends a new INVITE request to the S-CSCF#1 with the session attribute containing a unique URL for the AS#1 to receive media on.

Table A.4.3-10: INVITE request (AS#1 to S-CSCF#1)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 70
Route: <sip:cb03a0s09a2sdfglkj490333@scscf1.home1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+1-212-555-1111>
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=323551024"
Privacy: none
From: <sip:user1_public1@home1.net>; tag=234567
To: <sip:user2_public1@home2.net>
Call-ID: s09a233cbsdfglkj490303a0
Cseq: 278 INVITE
Contact: <sip:[7777::eee:ddd:ccc:aaa]>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933620 2987933620 IN IP6 7777::eee:ddd:ccc:aaa
s=-
c=IN IP6 as1.home1.net.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371

```

11. 100 (Trying) response (S-CSCF#1 to AS#1) - see example in table A.4.3-11

S-CSCF#1 sends a 100 (Trying) response provisional response to AS#1.

Table A.4.3-11: 100 (Trying) response (S-CSCF#1 to AS#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP as1.home1.net;branch=z9hG4bK240f34.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

12. INVITE request (S-CSCF#1 to I-CSCF#2) - see example in table A.4.3-12

S-CSCF#1 forwards the INVITE request to the I-CSCF#2. As the S-CSCF#1 does not know whether the I-CSCF at home2.net is a loose router or not, it does not introduce a Route header.

Table A.4.3-12: INVITE request (S-CSCF#1 to I-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 69
Record-Route: <sip:scscf1.home1.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=323551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

13. 100 (Trying) response (I-CSCF#2 to S-CSCF#1) - see example in table A.4.3-13

I-CSCF#2 sends a 100 (Trying) response provisional response to S-CSCF#1.

Table A.4.3-13: 100 (Trying) response (I-CSCF#1 to S-CSCF#1)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

14. Cx: User Location Query procedure

The I-CSCF sends a query to the HSS to find out the S-CSCF of the called user. The HSS responds with the address of the current S-CSCF for the terminating subscriber.

15. INVITE request (I-CSCF#2 to S-CSCF#2) ñ see example in table A.4.3-15

I-CSCF#2 forwards the INVITE request to the S-CSCF#2 that will handle the session termination.

Table A.4.3-15: INVITE request (I-CSCF#2 to S-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 68
Route: <sip:scscf2.home2.net;lr>
Record-Route:
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

NOTE: The I-CSCF does not add itself to the Record-Route header, as it has no need to remain in the signalling path once the session is established.

16. 100 (Trying) response (S-CSCF#2 to I-CSCF#2) ñ see example in table A.4.3-16

S-CSCF#2 responds to the INVITE request with a 100 (Trying) response provisional response.

Table A.4.3-16: 100 (Trying) response (S-CSCF#2 to I-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

17. Evaluation of initial filter criterias

S-CSCF#2 validates the service profile of this subscriber and evaluates the initial filter criterias. For sip:user2_public1@home2.net S-CSCF#2 has termination initial filter criteria with service points of interest of Method = INVITE request and SDP m = 'message' and 'msrp' protocol that informs the S-CSCF to route the INVITE request to the AS sip:as2.home2.net.

18. INVITE request (S-CSCF#2 to AS#2) ñ see example in table A.4.3-18

S-CSCF#2 forwards the INVITE request to AS#2

Table A.4.3-18: INVITE request (S-CSCF#2 to AS#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 67
Route: <sip:as2.home2.net;lr>,<sip:s09a233cbsdfglkj490303a0@scscf2.home2.net;lr>
Record-Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>
P-Asserted-Identity:
P-Charging-Vector:
P-Charging-Function-Addresses: ccf=[6666::b99:c88:d77:e66]; ccf=[6666::a55:b44:c33:d22];
    ecf=[6666::1ff:2ee:3dd:4ee]; ecf=[6666::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

19. 100 (Trying) response (AS#2 to S-CSCF#2) ñ see example in table A.4.3-19

S-CSCF#2 receives a 100 (Trying) response provisional response to the INVITE request.

Table A.4.3-19: 100 (Trying) response (AS#2 to S-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

20. TCP setup

AS#2 establishes a TCP connection to the host address and port as specified in the MSRP URL received in the SDP Offer from the AS#1.

21. INVITE request (AS#2 to S-CSCF#2) ñ see example in table A.4.3-21

AS#2 sends a new INVITE request to the S-CSCF#2 with the session attribute containing a unique URL for the AS#2 to receive media on.

Table A.4.3-21: INVITE request (AS#2 to S-CSCF#2)

```

INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 70
Route: <sip:s09a233cbsdfg1kj490303a0@scscf2.home2.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=423551024"
Privacy: none
From: <sip:user1_public1@home1.net>; tag=7871654
To: <sip:user2_public1@home2.net>
Call-ID: 0s09g1kj4903a2sdf33cb03a
Cseq: 210 INVITE
Contact: <sip:[9999::ccc:aaa:bbb:ddd]>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933630 2987933630 IN IP6 9999::ccc:aaa:bbb:ddd
s=-
c=IN IP6 as2.home2.net.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121

```

22. 100 (Trying) response (S-CSCF#2 to AS#2) ñ see example in table A.4.3-22

S-CSCF#2 receives a 100 (Trying) response provisional response to the INVITE request.

Table A.4.3-22: 100 (Trying) response (S-CSCF#2 to AS#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP as2.home2.net;branch=z9hG4bK348923.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

23. INVITE request (S-CSCF#2 to P-CSCF#2) ñ see example in table A.4.3-23

S-CSCF#2 forwards the INVITE request, as determined by the termination procedure. S-CSCF#2 remembers (from the registration procedure) the UE Contact address and the next hop CSCF for this UE.

Table A.4.3-23: INVITE request (S-CSCF#2 to P-CSCF#2)

```

INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 69
Route: <sip:pcscf2.visited2.net;lr>
Record-Route: <sip:scscf2.home2.net;lr>
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
P-Called-Party-ID: <sip:user2_public1@home2.net>
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

24. 100 (Trying) response (P-CSCF#2 to S-CSCF#2) ñ see example in table A.4.3-24

S-CSCF#2 receives a 100 (Trying) response provisional response to the INVITE request.

Table A.4.3-24: 100 (Trying) response (P-CSCF#2 to S-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

25. INVITE request (P-CSCF#2 to UE#2) ñ see example in table A.4.3-25

P-CSCF#2 forwards the INVITE request to the terminating UE.

Table A.4.3-25: INVITE request (P-CSCF#2 to UE#2)

```

INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
    scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 68
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
Cseq:
Contact:
Allow:
P-Called-Party-ID:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
a=
a=

```

26. 100 (Trying) response (UE#2 to P-CSCF#2) ñ see example in table A.4.3-26

UE#2 sends a 100 (Trying) response provisional response to P-CSCF#2.

Table A.4.3-26: 100 (Trying) response (UE#2 to P-CSCF#2)

```

SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
    scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0

```

27. Reserve IP-CAN bearer for media

The terminating UE#2 accepts the message session and. UE#2 reserves an IP-CAN bearer for the message session media component.

28. TCP setup

UE#2 establishes a TCP connection using the IP-CAN bearers established in step 27 to the host address and port as specified in the MSRP URL received in the SDP Offer from AS#2.

29. MSRP VISIT request (UE#2 to AS#2) ñ see example in table A.4.3-29

UE#2 sends a MSRP VISIT request to AS#2 using the established TCP connection.

Table A.4.3-29: MSRP VISIT request (UE#2 to AS#2)

```

MSRP VISIT
Boundary: 194sy2s
To-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121
From-path: msrp:// [5555::eee:fff:aaa:bbb]:3335/s417121
TR-ID: 2810
Message-ID: 2810
-----194sy2s$

```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Closing:	Same boundary string as well as Continuation-Flag

30. MSRP VISIT request (AS#2 to AS#1) – see example in table A.4.3-30

AS#2 sends a MSRP VISIT request to AS#1 using the established TCP connection.

Table A.4.3-30: MSRP VISIT request (AS#2 to AS#1)

```
MSRP VISIT
Boundary: 948qa2q
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371
From-path: msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122
TR-ID: 1730
Message-ID: 1730
-----948qa2q$
```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Closing:	Same boundary string as well as Continuation-Flag.

31. MSRP VISIT request (AS#1 to UE#1) – see example in table A.4.3-31

AS#1 sends a MSRP VISIT request to UE#1 using the established TCP connection.

Table A.4.3-31: MSRP VISIT request (AS#1 to UE#1)

```
MSRP VISIT
Boundary: i3hd83h
To-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
From-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
TR-ID: 1380
Message-ID: 1380
----- i3hd83h$
```

Boundary:	Boundary string used to terminate message
To-path:	The sender's remote path
From-path:	The sender's local URL
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Closing:	Same boundary string as well as Continuation-Flag

32. MSRP 200 (OK) response (UE#1 to AS#1) ñ see example in table A.4.3-32

UE#1 that acts as a MSRP host returns a MSRP 200 (OK) response to the MSRP VISIT request using the established TCP connection.

Table A.4.3-32: MSRP 200 (OK) response (UE#1 to AS#1)

```
MSRP 200 OK
Boundary: 3hdk39f
To-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
From-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
TR-ID: 1380
-----3hdk39f$
```

TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

33. MSRP 200 (OK) response (AS#1 to AS#2) ñ see example in table A.4.3-33

AS#1 returns a MSRP 200 (OK) response the MSRP VISIT request to AS#2 using the established TCP connection.

Table A.4.3-33: MSRP 200 (OK) response (AS#1 to AS#2)

```
MSRP 200 OK
Boundary: 9sne41k
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371
From-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122
TR-ID: 1730
-----9sne41k$
```

TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

34. MSRP 200 (OK) response (AS#2 to UE#2) ñ see example in table A.4.3-34

AS#2 returns a MSRP 200 (OK) response to the MSRP VISIT request to UE#2 using the established TCP connection.

Table A.4.3-34: MSRP 200 (OK) response (AS#2 to UE#2)

```
MSRP (...) 200 OK
Boundary: skjf93j
To:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121
From:[5555::eee:fff:aaa:bbb]:3335/s417121
TR-ID: 2810
-----skjf93j$
```

TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

35. 200 (OK) response (UE#2 to P-CSCF#2) ñ see example in table A.4.3-35

After the receipt of the MSRP 200 (OK) response to the MSRP VISIT request, the terminating UE#2 sends a 200 (OK) response for the INVITE request containing SDP that indicates that UE#2 has successfully visited AS#2.

Table A.4.3-35: 200 (OK) response (UE#2 to P-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
as2.home2.net;branch=z9hG4bK348923.1
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>
Privacy: none
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>;tag=7871654
To: <sip:user2_public1@home2.net>;tag=999456
Call-ID: 0s09g1kj4903a2sdf33cb03a
Cseq: 210 INVITE
Contact: <sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 29879336302987933630IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 my.MSRP.dummy.URL
t=0 0
m=message 9999 msrp *
a=accept-types:text/plain text/html message/cpim
a=path:msrp://[5555::eee:fff:aaa:bbb]:3335/s417121

```

36. 200 (OK) response (P-CSCF#2 to S-CSCF#2) ñ see example in table A.4.3-36

P-CSCF#2 forwards the 200 (OK) response to S-CSCF#2.

Table A.4.3-36: 200 (OK) response (P-CSCF#2 to S-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
as2.home2.net;branch=z9hG4bK348923.1
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=423551024"
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

37. 200 (OK) response (S-CSCF#2 to AS#2) ñ see example in table A.4.3-37

S-CSCF#2 forwards the 200 (OK) response to AS#2.

Table A.4.3-37: 200 (OK) response (S-CSCF#2 to AS#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP as2.home2.net;branch=z9hG4bK348923.1
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=423551024"; orig-ioi=home1.net;
term-ioi=home2.net
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

38. ACK request (AS#2 to S-CSCF#2) ñ see example in table A.4.3-38

AS#2 generates a new ACK request and sends it to S-CSCF#2.

Table A.4.3-38: ACK request (AS#2 to S-CSCF#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 70
Route: <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From: <sip:user1_public1@home1.net>;tag=7871654
To: <sip:user2_public1@home2.net>;tag=2217770
Call-ID: 0s09g1kj4903a2sdf33cb03a
Cseq: 210 ACK
Content-Length: 0

```

39. ACK request (S-CSCF#2 to P-CSCF#2) ñ see example in table A.4.3-39

S-CSCF#1 forwards the ACK request to P-CSCF#2.

Table A.4.3-39: ACK request (S-CSCF#2 to P-CSCF#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 69
Route: <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

40. ACK request (P-CSCF#2 to UE#2) ñ see example in table A.4.3.40

P-CSCF#2 forwards the ACK request to UE#2.

Table A.4.3-40: ACK request (P-CSCF#2 to UE#2)

```

ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK361k21.1, SIP/2.0/UDP
    scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    as2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:

```

41. 200 (OK) response (AS#2 to S-CSCF#2) ñ see example in table A.4.3-41

AS#2 generates a 200 (OK) response to S-CSCF#2.

Table A.4.3-41: 200 (OK) response (AS#2 to S-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
    icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Record-Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"
From: <sip:user1_public1@home1.net>;tag=234567
To: <sip:user2_public1@home2.net>;tag=98989823
Call-ID: s09a233cbsdfglkj490303a0
CSeq: 278 INVITE
Contact: <sip:[9999::ccc:aaa:bbb:ddd]>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933640 2987933640 IN IP6 9999::ccc:aaa:bbb:ddd
s=-
c=IN IP6 as2.home2.net.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a= path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122

```

42. 200 (OK) response (S-CSCF#2 to I-CSCF#2) ñ see example in table A.4.3-42

S-CSCF#2 forwards the 200 (OK) response to I-CSCF#2.

Table A.4.3-42: 200 (OK) response (S-CSCF#2 to I-CSCF#2)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
Privacy:
P-Charging-Vector: icid-value"AyretyU0dm+602IrT5tAFrbHLso=323551024"; orig-ioi=home1.net;
    term-ioi=home2.net
P-Charging-Function-Addresses: ccf=[6666::b99:c88:d77:e66]; ccf=[6666::a55:b44:c33:d22];
    ecf=[6666::1ff:2ee:3dd:4ee]; ecf=[6666::6aa:7bb:8cc:9dd]
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

43. 200 (OK) response (I-CSCF#2 to S-CSCF#1) ñ see example in table A.4.3-43

I-CSCF#2 forwards the 200 (OK) response to S-CSCF#1.

Table A.4.3-43: 200 (OK) response (I-CSCF#2 to S-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Record-Route:
P-Asserted-Identity:
Privacy: none
P-Charging-Vector:
From:
To:
Call-ID:
CSeq:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

44. 200 (OK) response (S-CSCF#1 to AS#1) ñ see example in table A.4.3-44

S-CSCF#1 forwards the 200 (OK) response to AS#1.

Table A.4.3-44: 200 (OK) response (S-CSCF#1 to AS#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP as1.home1.net;branch=z9hG4bK240f34.1
Record-Route:
P-Asserted-Identity:
Privacy:
P-Charging-Vector:
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
    ecf=[5555::1ff:2ee:3dd:4ee]; ecf=[5555::6aa:7bb:8cc:9dd]
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

45. ACK request (AS#1 to S-CSCF#1) - see example in table A.4.3-45

AS#1 generates an ACK request and sends it to S-CSCF#1.

Table A.4.3-45: ACK request (AS#1 to S-CSCF#1)

```

ACK sip:[9999::ccc:aaa:bbb:ddd] SIP/2.0
Via: SIP/2.0/UDP as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 70
Route: <sip:scscf1.home1.net;lr>, <sip:scscf2.home2.net;lr>
From: <sip:user1_public1@home1.net>; tag=234567
To: <sip:user2_public1@home2.net>; tag=98989823
Call-ID: s09a233cbsdfglkj490303a0
Cseq: 278 ACK
Content-Length: 0

```

46. ACK request (S-CSCF#1 to S-CSCF#2) - see example in table A.4.3-46

The S-CSCF#1 forwards the ACK request to S-CSCF#2.

Table A.4.3-46: ACK request (S-CSCF#1 to S-CSCF#2)

```

ACK sip:[9999::ccc:aaa:bbb:ddd] SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP as1.home1.net;branch=
    z9hG4bK240f34.1
Max-Forwards: 69
Route: <sip:scscf2.home2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

47. ACK request (S-CSCF#2 to AS#2) - see example in table A.4.3-47

The S-CSCF#2 forwards the ACK request to the AS#2.

Table A.4.3-47: ACK request (S-CSCF#2 to AS#2)

```

ACK sip:[9999::ccc:aaa:bbb:ddd] SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    as1.home1.net;branch=z9hG4bK240f34.1
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:

```

48. 200 (OK) response (AS#1 to S-CSCF#1) ñ see example in table A.4.3-48

AS#1 generates a 200 (OK) response and sends it to S-CSCF#1.

Table A.4.3-48: 200 (OK) response (AS#1 to S-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"
From: <sip:user1_public1@home1.net>;tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 127 INVITE
Contact: <sip:[7777::eee:ddd:ccc:aaa]>
Allow:
Content-Type:
Content-Length:

v=0
o=- 2987933642 2987933642 IN IP6 7777::eee:ddd:ccc:aaa
s=-
c=IN IP6 as1.home1.net.URL
t=0 0
m=message 9999 msrp *
a=accept-types:message/cpim text/plain text/html
a=path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372

```

49. 200 (OK) response (S-CSCF#1 to P-CSCF#1) ñ see example in table A.4.3-49

S-CSCF#1 forwards the 200 (OK) response to P-CSCF#1.

Table A.4.3-49: 200 (OK) response (S-CSCF#1 to P-CSCF#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
Privacy:
P-Charging-Vector: icid-value="AyretyU0dm+602IrT5tAFrbHLso=023551024"
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

50. 200 (OK) response (P-CSCF#1 to UE#1) ñ see example in table A.4.3-50

P-CSCF#1 forwards the 200 (OK) response to UE#1

Table A.4.3-50: 200 (OK) response (P-CSCF#1 to UE#1)

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
a=

```

51. ACK request (UE#1 to P-CSCF#1) ñ see example in table A.4.3-51

The UE responds to the 200 (OK) response with an ACK request sent to the P-CSCF#1.

Table A.4.3-51: ACK request (UE#1 to P-CSCF#1)

```

ACK sip:[7777::eee:ddd:ccc:aaa] SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
From: <sip:user1_public1@home1.net>;tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfg1kj490333
Cseq: 127 ACK
Content-Length: 0

```

52. ACK request (P-CSCF#1 to S-CSCF#1) ñ see example in table A.4.3-52

The P-CSCF#1 forwards the ACK request to the S-CSCF#1.

Table A.4.3-52: ACK request (P-CSCF#1 to S-CSCF#1)

```

ACK sip:[7777::eee:ddd:ccc:aaa] SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:

```

53. ACK request (S-CSCF#1 to AS#1) - see example in table A.4.3-53

The S-CSCF#1 forwards the ACK request to AS#1.

Table A.4.3-53: ACK request (S-CSCF#1 to AS#1)

```

ACK sip:[7777::eee:ddd:ccc:aaa] SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK344a65.1, SIP/2.0/UDP
    pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:

```

54. MSRP SEND (UE#1 to AS#1) ñ see example in table A.4.3-54

The originating UE sends the first message over the MSRP session with a MSRP SEND request using the established TCP connection.

Table A.4.3-54: MSRP SEND (UE#1 to AS#1)

```

MSRP SEND
Boundary: 34kjf94
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
From-path:msrp://[5555::aaa:bbb:ccc:ddd]:3402/s111271
TR-ID: 8822
Message-ID: 8822
Content-Type: "text/plain"

I will never be a member of a club that accepts people like me as members - Groucho Marx.
-----34kjf94$

```

Boundary: Boundary string used to terminate message.

To-path:	The sender's remote path.
From-path:	The sender's local URL.
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Content-Type:	The format of the body of the request.
Closing:	Same boundary string as well as Continuation-Flag.

55. MSRP SEND (AS#1 to AS#2) ñ see example in table A.4.3-55

AS#1 forwards the first MSRP SEND request to AS#2 over the MSRP session using the established TCP connection.

Table A.4.3-55: MSRP SEND (AS#1 to AS#2)

```
MSRP SEND
Boundary: shfsoi3
To-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122
From-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371
TR-ID: 2832
Message-ID: 2832
Content-Type: "text/plain"

I will never be a member of a club that accepts people like me as members - Groucho Marx.
-----shfsoi3$
```

Boundary:	Boundary string used to terminate message.
To-path:	The sender's remote path.
From-path:	The sender's local URL.
TR-ID:	A unique transaction ID for this MSRP transaction.
Message-ID:	A unique message ID for MSRP message.
Content-Type:	The format of the body of the request.
Closing:	Same boundary string as well as Continuation-Flag.

56. MSRP SEND (AS#2 to UE#2) ñ see example in table A.4.3-56

AS#2 forwards the first MSRP SEND request to UE#2 over the MSRP session using the established TCP connection.

Table A.4.3-56: MSRP SEND (AS#2 to UE#2)

```
MSRP SEND
Boundary: 2oid4sf
To-path:msrp://[5555::eee:fff:aaa:bbb]:3335/s417121
From-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121
TR-ID: 3311
Message-ID: 3311
Content-Type: "text/plain"

I will never be a member of a club that accepts people like me as members - Groucho Marx.
-----2oid4sf$
```

Boundary:	Boundary string used to terminate message.
To-path:	The sender's remote path.
From-path:	The sender's local URL.

- TR-ID:** A unique transaction ID for this MSRP transaction.
- Message-ID:** A unique message ID for MSRP message.
- Content-Type:** The format of the body of the request.
- Closing:** Same boundary string as well as Continuation-Flag.

57. MSRP 200 (OK) response (UE#2 to AS#2) ñ see example in table A.4.3-57

The receiving UE#2 acknowledges the reception of the MSRP SEND request with a MSRP 200 (OK) response sent using the established TCP connection.

Table A.4.3-57: MSRP 200 (OK) response (UE#2 to AS#2)

```
MSRP 200 OK
Boundary: 2j32ri3
To-path:msrp://[5555::eee:fff:aaa:bbb]:3335/s417121
From-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317121
TR-ID: 3311
-----2j32ri3$
```

- TR-ID:** The transaction ID for this MSRP transaction, as received in the related MSRP request.

58. MSRP 200 (OK) response (AS#2 to AS#1) ñ see example in table A.4.3-58

AS#2 acknowledges the reception of the MSRP SEND request with a MSRP 200 (OK) response to AS#1 using the established TCP connection.

Table A.4.3-58: MSRP 200 (OK) response (AS#2 to AS#1)

```
MSRP 200 OK
Boundary: wnhus9o
To-path:msrp://[9999::ccc:aaa:bbb:ddd]:3333/s317122
From-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222371
TR-ID: 2832
-----wnhus9o$
```

- TR-ID:** The transaction ID for this MSRP transaction, as received in the related MSRP request.

59. MSRP 200 (OK) response (AS#1 to UE#1) ñ see example in table A.4.3-59

AS#1 acknowledges the reception of the MSRP SEND request with a MSRP 200 (OK) response to UE#1 sent using the established TCP connection.

Table A.4.3-59: MSRP 200 (OK) response (AS#1 to UE#1)

```
MSRP 200 OK
Boundary: 3is09wh
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
To-path:msrp://[7777::eee:ddd:ccc:aaa]:3927/s222372
TR-ID: 8822
-----3is09wh$
```

- TR-ID:** The transaction ID for this MSRP transaction, as received in the related MSRP request.

A.4.4 Establishing a session for session-based messaging with preconditions

This signalling flow is not provided as it is the same as the session establishment flows with preconditions in 3GPP TS 24.228 [4] except that the SDP contents are for setting up MSRP sessions over TCP rather than RTP sessions over UDP.

A.5 Flows demonstrating session-based messaging conferences

Annex C (informative): Change history

It is usual to include an annex (usually the final annex of the document) for specifications under TSG change control which details the change history of the specification using a table as follows:

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2003-06					Version 0.0.1: Initial version for discussion		
2003-06	CN#31				Version 0.0.2: Title and text changed in order to reflect that Messaging is a service.	N1-031123	N1-031281
2003-09					Version 0.1.0: Title changed		
2003-12					Version 0.2.0: Incorporated the following CRs as approved at CN#32 meeting: N1-031676: Message Sessions in IMS ñ Call Flow N1-031677: Immediate Messaging ñ Call Flow reference to 24.228 N1-031722: Message Sessions in IMS ñ Text (created Annex B) N1-031723: Immediate Messaging ñ Text Additionally the editor took the freedom to change the heading formats in subclause B.5. Also the title <void> of subclause B.5 was replaced with the title of clause 5 in the main part of the text and subclauses B.5.1 and B.5.2 were added (both <void>).		
2003-12					Version 0.2.1: Including minor issues that were left out by mistake when creating version 0.2.0		
2004-01					Version 0.3.0: Incorporated the following CRs as approved at CN#32bis meeting: N1-040151 ñ Message Session in IMS N1-040189 ñ Deletion of imported and unused Definitions N1-040197 ñ UE to UE message session flow N1-040198 ñ Message Session Initiation ñ mobile originating case N1-040199 ñ Message Session Initiation ñ mobile terminating case N1-040200 ñ Use of MESSAGE versus MSRP		
2004-01					Version 0.3.1: Including N1-040200, that was left out (although listed) by mistake when creating version 0.3.0		
2004-02					Version 0.4.0: Incorporated the following CRs as approved at CN1#33 meeting: - N1-040261 ñ Update of Scope - N1-040262 ñ Correction of Flows - N1-040280 ñ Editorial Changes - N1-040306 ñ Corections to Annex A.4.3 - N1-040307 ñ Corrections to Annex B - N1-040426 ñ SDP for session-based messaging - N1-040429 ñ Corrections to Annex A.1 ñ A.4.2 - N1-040486 ñ Definition of MSRP Role for AS and MRFP - N1-040488 ñ Session-based Messaging with Intermediate Node Flow A.4.3		
2004-02					Version 0.4.1: Added subclause 9.2.2, which was missing from last update. Minor editorials		
2004-04					Version 0.5.0: Incorporated the following CRs as approved as CN1#33bis meeting: - N1-040561 ñ MSRP in AS - N1-040648 ñ Editorial changes to Annex A - N1-040738 ñ MSRP terminating UE hosting flow as well as minor editorial changes		
2004-05					Version 1.0.0: Incorporated the following CRs as approved during CN1#34 meeting: - N1-041038 ñ Shifting Material from Annex B to main body - N1-041036 ñ Corrections to Message Sessions Flows - N1-041040 ñ Ut for Messaging - N1-040850 ñ Correction of signalling flow example - N1-041037 ñ Establishing a session with active intermediate nodes, with originating UE hosting, and without SBLP - N1-041039 ñ Addition of Note to 5.3.1.1 - several smaller editorial changes Note: the material was first shifted from Annex B to the main body (approved CR in N1-041038), all CRs that were written against material in Annex B were afterwards applied against the material in the main body.		

2004-05				Version 1.0.1 produced to correct smaller editorial mistakes.		
2004-06				Version 1.1.0 produced as outcome of CN#34bis meeting in Helsinki, Finland. Tdoc N1-041172 (Changes in MSRP) and smaller editorial changes incorporated.		
2004-08				Version 1.2.0 produced as outcome CN#35 meeting in Sophia Antipolis, France. Tdoc N1-041585 (AS section) and smaller editorial changes incorporated.		
2004-11				Version 6.0.0 produces as outcome of CN#36 meeting in Seoul, South Korea. The following documents were incorporated: N1-041714 ñ deletion of intro claus N1-041716 ñ Terminology alignment N1-041989 ñ Data Manipulation for IMS Messaging in Rel-6 N1-041995 ñ Session establishment for session-mode messaging N1-041996 ñ Session-based messaging conferences N1-041997 ñ subclause 8 rework N1-041998 ñ general subclause in participant section N1-041999 ñ subclause 9 rework N1-042001 ñ Participant in immediate messaging N1-042114 ñ subclause 10 rework N1-042115 ñ subclause 6 rework		