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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 #24:

This is the first presentation

Outstanding Issues:

- SBLP and Messaging Sessions (dependant on outstanding SA2 decision)
 - MSRP protocol completion (dependant on IETF)
 - Length of a Instant Message that requires usage of MSRP
 - IETF and 3GPP terminology alignment (based on recent SA1 LS)
 - MSRP procedures at the AS / terminology
 - minor issues
 - Ut procedures (referencing other specifications)
 - usage of other protocols (none foreseen, besides those for Ut)
 - linkage to conferencing for session-based messaging conferences
 - Refrence to Group Management Stage 1
 - terminology clarifications – participant
-

Contentious Issues:

- Outstanding Issues from SA2 and IETF as listed above
-

3GPP TS 24.247 V1.2.0 (2004-09)

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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Contents

Foreword.....	6
Introduction.....	6
1 Scope	7
2 References	7
3 Definitions, symbols and abbreviations.....	8
3.1 Definitions.....	8
3.2 Abbreviations	8
4 Messaging overview	8
5 Protocol using SIP for immediate messaging.....	9
5.1 Introduction.....	9
5.2 Functional entities	9
5.2.1 User Equipment (UE).....	9
5.2.2 Application Server (AS)	9
5.3 Role.....	9
5.3.1 Participant.....	9
5.3.1.1 Sending of an immediate message	9
5.3.1.2 Receiving an immediate message	9
5.3.2 List Server	10
6 Protocol using SIP for session-based messaging.....	10
6.1 Introduction.....	10
6.2 Functional entities	10
6.2.1 User Equipment (UE).....	10
6.3 Role.....	10
6.3.1 Participant.....	10
6.3.1.1 General	10
6.3.1.2 Session initiation - mobile originating case.....	10
6.3.1.3 Session initiation - mobile terminating case	10
6.3.2 Intermediate Node	11
6.3.2.1 General	11
6.3.2.2 Session initiation - AS transiting case	11
7 Protocol using SIP for session-based messaging conferences.....	11
7.1 Introduction.....	11
7.2 Functional entities	11
7.2.1 User Equipment (UE).....	11
7.3 Role.....	11
7.3.1 Participant.....	11
8 Protocol using SDP for session-based messaging and session-based messaging conferences.....	12
8.1 Introduction.....	12
8.2 Functional entities	12
8.2.1 User Equipment (UE).....	12
8.2.2 Media Resource Function Controller (MRFC).....	12
8.2.3 Application Server (AS)	12
8.3 Role.....	13
9 Protocol using MSRP for session-based messaging and session-based messaging conferences	13
9.1 Introduction.....	13
9.2 Functional entities	13
9.2.1 User Equipment (UE).....	13
9.2.1.1 General	13
9.2.2 Application Server (AS)	13
9.2.3 Media Resource Function Processor (MRFP)	13
9.3 Role.....	14

10	Protocol for data manipulation at the Ut reference point.....	14
10.1	Introduction	14
10.2	Functional entities	14
10.2.1	User Equipment (UE)	14
10.2.2	Application Server (AS)	14
10.3	Role	14
10.3.1	Data Manipulator (DM).....	14
10.3.2	Data Manipulation Server (DMS)	14
Annex A (informative): Example signalling flows of messaging service operation		15
A.1	Scope of signalling flows	15
A.2	Introduction.....	15
A.2.1	General	15
A.2.2	Key required to interpret signalling flows	15
A.3	Signalling flows demonstrating immediate messaging	15
A.4	Signalling flows demonstrating session-based messaging	15
A.4.1	Introduction	15
A.4.2	Establishing a session for session-based messaging without preconditions	15
A.4.3	Establishing a session for session-based messaging with Intermediate Nodes.....	30
A.4.4	Establishing a session for session-based messaging with preconditions	54
A.5	Flows demonstrating session-based messaging conferences.....	55
Annex C (informative): Change history		56

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 other protocols. The document covers immediate messaging, session-based messaging and session-based messaging conferences.

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.

- 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.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Host

Session inactivity timer

Visitor

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

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 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 messaging

5.1 Introduction

5.2 Functional entities

5.2.1 User Equipment (UE)

For the purpose of immediate 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 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

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.

5.3.1.1 Sending of an immediate message

When sending an immediate 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].

5.3.1.2 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 messaging

6.1 Introduction

6.2 Functional entities

6.2.1 User Equipment (UE)

For the purpose of session-based 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].

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 participant wishes to engage an endpoint in a message session, it will send an initial INVITE request to the endpoint. The participant may select to initiate a message session either:

- 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 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 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 messaging conferences

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

7.1 Introduction

7.2 Functional entities

7.2.1 User Equipment (UE)

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

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 messaging and session-based messaging conferences

8.1 Introduction

8.2 Functional entities

8.2.1 User Equipment (UE)

For the purpose of session-based messaging and session-based messaging conferences, the UE 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].

8.2.2 Media Resource Function Controller (MRFC)

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,

the AS 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].

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

9 Protocol using MSRP for session-based messaging and session-based 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]; and
- implement the role of an MSRP receiver as described in draft-ietf-simple-message-sessions [9].

9.2.2 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
- a conferencing AS for session-based messaging conferences,

the AS shall implement the role of:

- 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)

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

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)

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

10.2.2 Application Server (AS)

The AS shall implement the role of a Data manipulation server as described in subclause B.10.3.2

10.3 Role

10.3.1 Data Manipulator (DM)

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)

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:

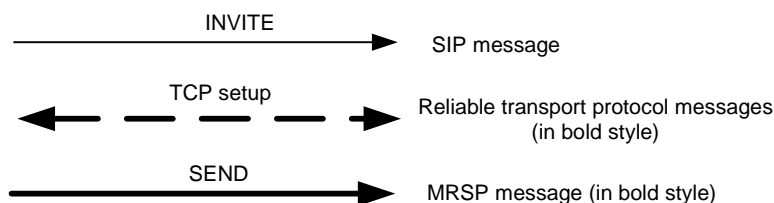


Figure A.2.2-1: Signalling flow notation

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.

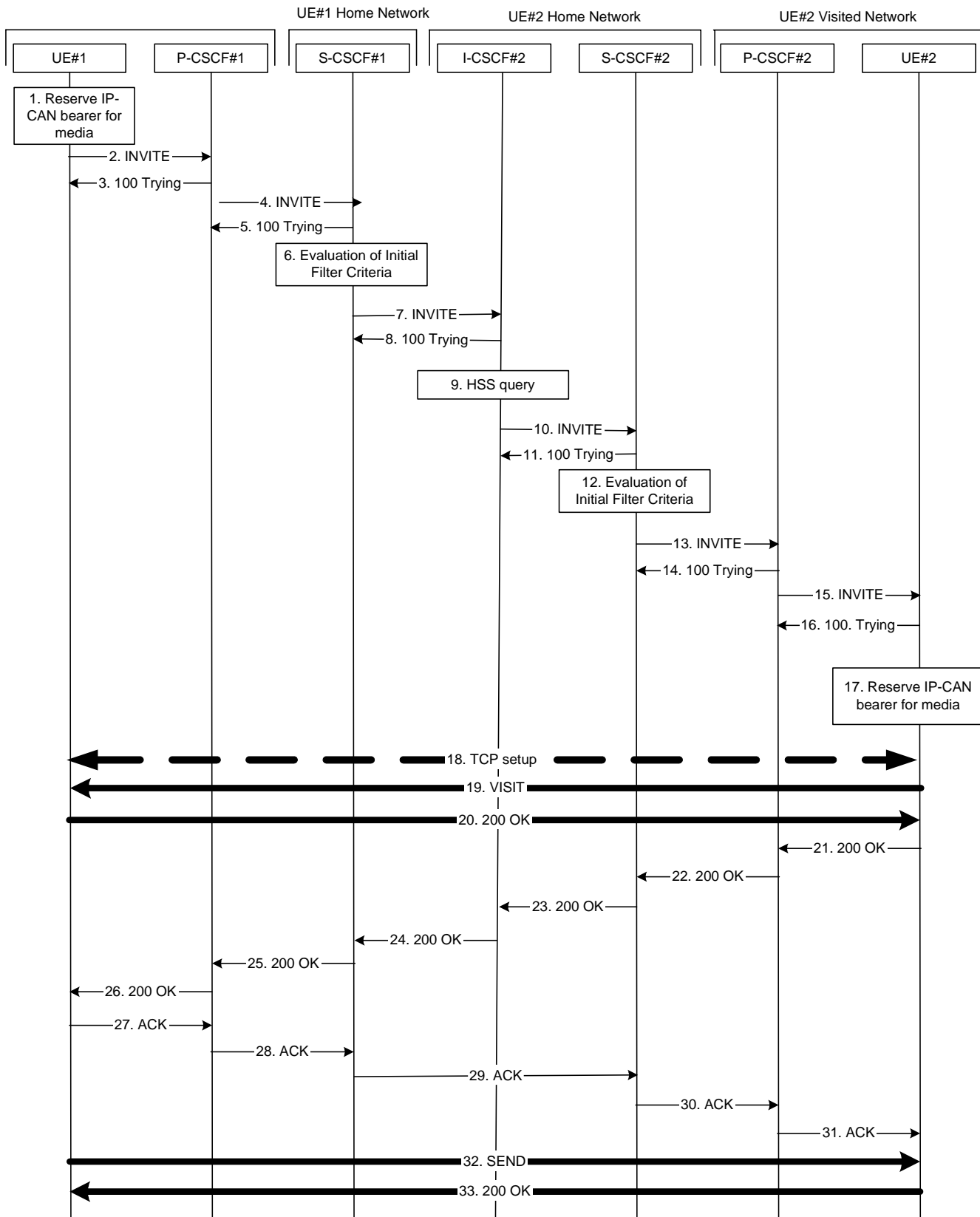


Figure A.4.2-1: Establishment of MSRP session

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+602IrT5tAFrbHLso=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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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: cb03a0s09a2sdfgkjk490333
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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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$
```

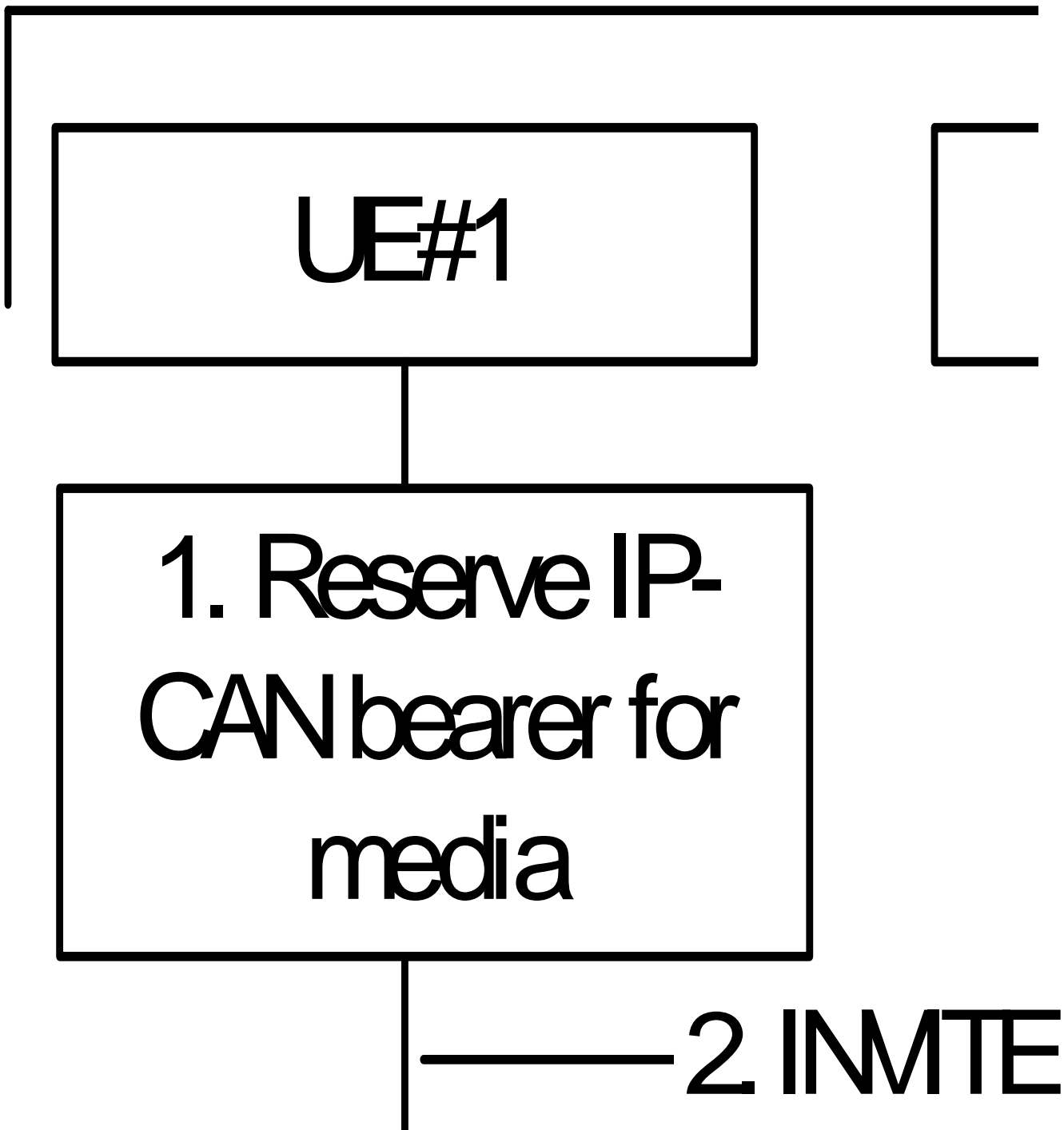
TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

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

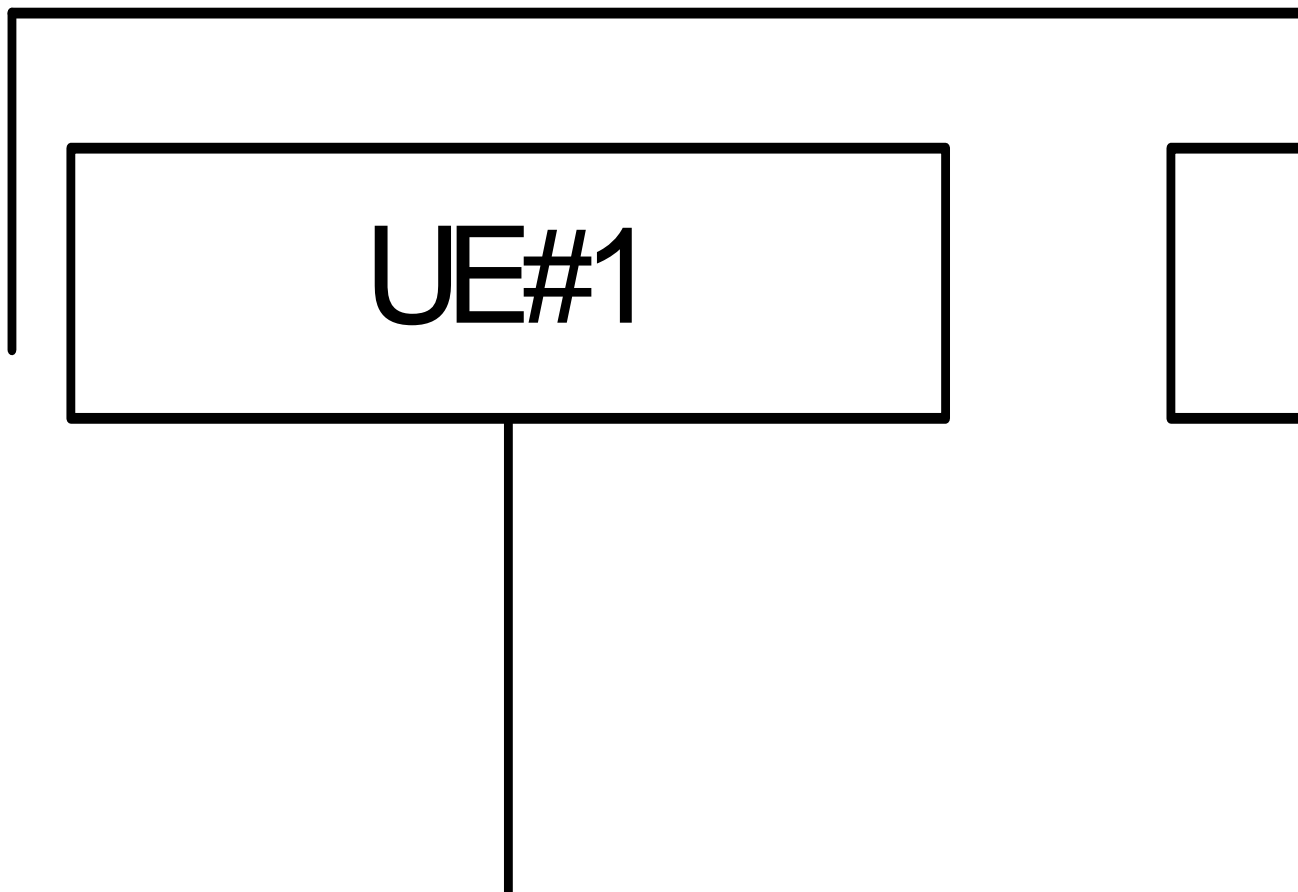


Figure A.4.3-1: Establishment of MSRP session with Intermediate Nodes

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+602IrT5tAFrbHLso=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) – 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) – 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) – 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) – 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:s09a233cbsdfglkj490303a0@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: 0s09glkj4903a2sdf33cb03a
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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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-loi=home1.net;
    term-loi=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) – 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: 0s09glkj4903a2sdf33cb03a
Cseq: 210 ACK
Content-Length: 0

```

39. ACK request (S-CSCF#2 to P-CSCF#2) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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 – Call Flow N1-031677: Immediate Messaging – Call Flow reference to 24.228 N1-031722: Message Sessions in IMS – Text (created Annex B) N1-031723: Immediate Messaging – 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 – Message Session in IMS N1-040189 – Deletion of imported and unused Definitions N1-040197 – UE to UE message session flow N1-040198 – Message Session Initiation – mobile originating case N1-040199 – Message Session Initiation – mobile terminating case N1-040200 – 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 – Update of Scope - N1-040262 – Correction of Flows - N1-040280 – Editorial Changes - N1-040306 – Corections to Annex A.4.3 - N1-040307 – Corrections to Annex B - N1-040426 – SDP for session-based messaging - N1-040429 – Corrections to Annex A.1 – A.4.2 - N1-040486 – Definition of MSRP Role for AS and MRFP - N1-040488 – 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 – MSRP in AS - N1-040648 – Editorial changes to Annex A - N1-040738 – 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 – Shifting Material from Annex B to main body - N1-041036 – Corrections to Message Sessions Flows - N1-041040 – Ut for Messaging - N1-040850 – Correction of signalling flow example - N1-041037 – Establishing a session with active intermediate nodes, with originating UE hosting, and without SBLP - N1-041039 – 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.		

3GPP TS 24.247 V1.24.0 (2004-0986)

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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UMTS, Network, IP, SIP, SDP, multimedia

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Contents

Foreword.....	7
Introduction.....	7
1 Scope	8
2 References	8
3 Definitions, symbols and abbreviations.....	9
3.1 Definitions.....	9
3.2 Abbreviations	9
4 Messaging overview	9
5 Protocol using SIP for immediate messaging.....	10
5.1 Introduction.....	10
5.2 Functional entities.....	10
5.2.1 User Equipment (UE).....	10
5.2.2 Application Server (AS).....	10
5.3 Role.....	10
5.3.1 Participant.....	10
B.5.3.1.1 Sending of an immediate message.....	10
B.5.3.1.2 Receiving an immediate message	10
5.3.2 List Server	11
6 Protocol using SIP for session-based messaging.....	11
6.1 Introduction.....	11
6.2 Functional entities.....	11
6.2.1 User Equipment (UE).....	11
6.3 Role.....	11
6.3.1 Participant.....	11
6.3.1.1 General	11
6.3.1.2 Session initiation - mobile originating case.....	11
6.3.1.3 Session initiation - mobile terminating case.....	11
6.3.2 Intermediate Node	12
6.3.2.1 General	12
6.3.2.2 Session initiation - AS transiting case	12
7 Protocol using SIP for session-based messaging conferences.....	12
7.1 Introduction.....	12
7.2 Functional entities	12
7.2.1 User Equipment (UE).....	12
7.3 Role.....	12
7.3.1 Participant.....	12
8 Protocol using SDP for session-based messaging and session-based messaging conferences.....	13
8.1 Introduction.....	13
8.2 Functional entities	13
8.2.1 User Equipment (UE).....	13
B.8.2.2 Media Resource Function Controller (MRFC).....	13
B.8.2.3 Application Server (AS).....	13
8.3 Role.....	14
9 Protocol using MSRP for session-based messaging and session-based messaging conferences	14
9.1 Introduction.....	14
9.2 Functional entities	14
9.2.1 User Equipment (UE).....	14
9.2.1.1 General	14
9.2.2 Application Server (AS).....	15
9.2.3 Media Resource Function Processor (MRFP)	15
9.3 Role.....	15

10	Protocol for data manipulation at the Ut reference point.....	15
10.1	Introduction	16
10.2	Functional entities	16
10.2.1	User Equipment (UE)	16
10.2.2	Application Server (AS)	16
10.3	Role	16
10.3.1	Data Manipulator (DM)	16
10.3.2	Data Manipulation Server (DMS)	16
Annex A (informative): Example signalling flows of messaging service operation		16
A.1	Scope of signalling flows	16
A.2	Introduction	16
A.2.1	General	16
A.2.2	Key required to interpret signalling flows	16
A.3	Signalling flows demonstrating immediate messaging	17
A.4	Signalling flows demonstrating session-based messaging	17
A.4.1	Introduction	17
A.4.2	Establishing a session for session-based messaging without preconditions	17
A.4.3	Establishing a session for session-based messaging with Intermediate Nodes	31
A.4.4	Establishing a session for session-based messaging with preconditions	55
A.5	Flows demonstrating session-based messaging conferences	56
Annex C (informative): Change history		57
Foreword		7
Introduction		7
1	Scope	8
2	References	8
3	Definitions, symbols and abbreviations	9
3.1	Definitions	9
3.2	Abbreviations	9
4	Messaging overview	9
5	Protocol using SIP for immediate messaging	10
5.1	Introduction	10
5.2	Functional entities	10
5.2.1	User Equipment (UE)	10
5.2.3	Application Server (AS)	10
5.3	Role	10
5.3.1	Participant	10
B.5.3.1.1	Sending of an immediate message	10
B.5.3.1.2	Receiving an immediate message	10
5.3.2	List Server	11
6	Protocol using SIP for session-based messaging	11
6.1	Introduction	11
6.2	Functional entities	11
6.2.1	User Equipment (UE)	11
6.3	Role	11
6.3.1	Participant	11
7	Protocol using SIP for session-based messaging conferences	11
7.1	Introduction	11
7.2	Functional entities	11
7.2.1	User Equipment (UE)	11
7.3	Role	11
7.3.1	Participant	11
8	Protocol using SDP for session-based messaging and session-based messaging conferences	12
8.1	Introduction	12
8.2	Functional entities	12

8.2.1	User Equipment (UE)	12
B.8.2.2	Media Resource Function Controller (MRFC)	12
B.8.2.3	Application Server (AS)	12
8.3	Role	13
9	Protocol using MSRP for session-based messaging and session-based messaging conferences	13
9.1	Introduction	13
9.2	Functional entities	13
9.2.1	User Equipment (UE)	13
B.9.2.1.1	General	13
B.9.2.1.2	Session initiation – mobile originating case	13
B.9.2.1.3	Session initiation – mobile terminating case	13
9.2.2	Application Server (AS)	14
B.9.2.3	Media Resource Function Processor (MRFP)	14
9.3	Role	14
10	Protocol for data manipulation at the Ut reference point	14
10.1	Introduction	15
10.2	Functional entities	15
10.2.1	User Equipment (UE)	15
10.2.2	Application Server (AS)	15
10.3	Role	15
10.3.1	Data Manipulator (DM)	15
10.3.2	Data Manipulation Server (DMS)	15
Annex A (informative): Example signalling flows of messaging service operation		15
A.1	Scope of signalling flows	15
A.2	Introduction	15
A.2.1	General	15
A.2.2	Key required to interpret signalling flows	15
A.3	Signalling flows demonstrating immediate messaging	16
A.4	Signalling flows demonstrating session-based messaging	16
A.4.1	Introduction	16
A.4.2	Establishing a session for session-based messaging without preconditions	16
A.4.3	Establishing a session for session-based messaging with Intermediate Nodes	30
A.4.4	Establishing a session for session-based messaging with preconditions	54
A.5	Flows demonstrating session-based messaging conferences	55
Annex C (informative): Change history		56

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:
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 - 2 presented to TSG for approval;
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- 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 other protocols. The document covers immediate messaging, session-based messaging and session-based messaging conferences.

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.

- 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.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Host

Session inactivity timer

Visitor

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

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 ore 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 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 messaging

5.1 Introduction

5.2 Functional entities

5.2.1 User Equipment (UE)

For the purpose of immediate 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 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

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.

~~B~~5.3.1.1 Sending of an immediate message

When sending an immediate 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].

~~B~~5.3.1.2 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 messaging

6.1 Introduction

6.2 Functional entities

6.2.1 User Equipment (UE)

For the purpose of session-based 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].

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 participant wishes to engage an endpoint in a message session, it will send an initial INVITE request to the endpoint. The participant may select to initiate a message session either:

- 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 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 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 messaging conferences

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

7.1 Introduction

7.2 Functional entities

7.2.1 User Equipment (UE)

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

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 messaging and session-based messaging conferences

8.1 Introduction

8.2 Functional entities

8.2.1 User Equipment (UE)

For the purpose of session-based messaging and session-based messaging conferences, the UE 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].

B.8.2.2 Media Resource Function Controller (MRFC)

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].

B.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,

the AS 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].

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

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

9.1 Introduction

9.2 Functional entities

9.2.1 User Equipment (UE)

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

~~B.9.2.1.2~~ — Session initiation – mobile originating case

~~When the UE wishes to engage an endpoint in a message session, it will send an initial INVITE request to the endpoint. The UE may select to initiate a message session either~~

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

~~If the UE 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 UE 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.~~

~~B.9.2.1.3~~ — Session initiation – mobile terminating case

~~When the terminating UE receives an initial INVITE request from the originating endpoint proposing a message session, the initial INVITE request may indicate that~~

- ~~a) the precondition and reliable provisional responses extensions are neither required nor support; or~~
- ~~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 UE shall proceed as specified in the draft-ietf-simple-message-~~

~~sessions [9]. When opening a TCP connection, the terminating UE 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 UE 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 UE may specify the bandwidth if it was specified in the received SDP offer and the bandwidth that it may specify in the SDP answer.~~

9.2.2 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
- a conferencing AS for session-based messaging conferences,

the AS shall implement the role of:

- 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.

~~B.~~9.2.3 Media Resource Function Processor (MRFP)

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

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)

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

10.2.2 Application Server (AS)

The AS shall implement the role of a Data manipulation server as described in subclause B.10.3.2

10.3 Role

10.3.1 Data Manipulator (DM)

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)

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:

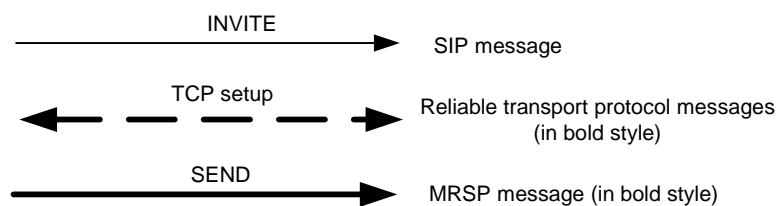


Figure A.2.2-1: Signalling flow notation

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:

- at what point in time the IP-CAN for the media component (MSRP) is set up; or
- 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.

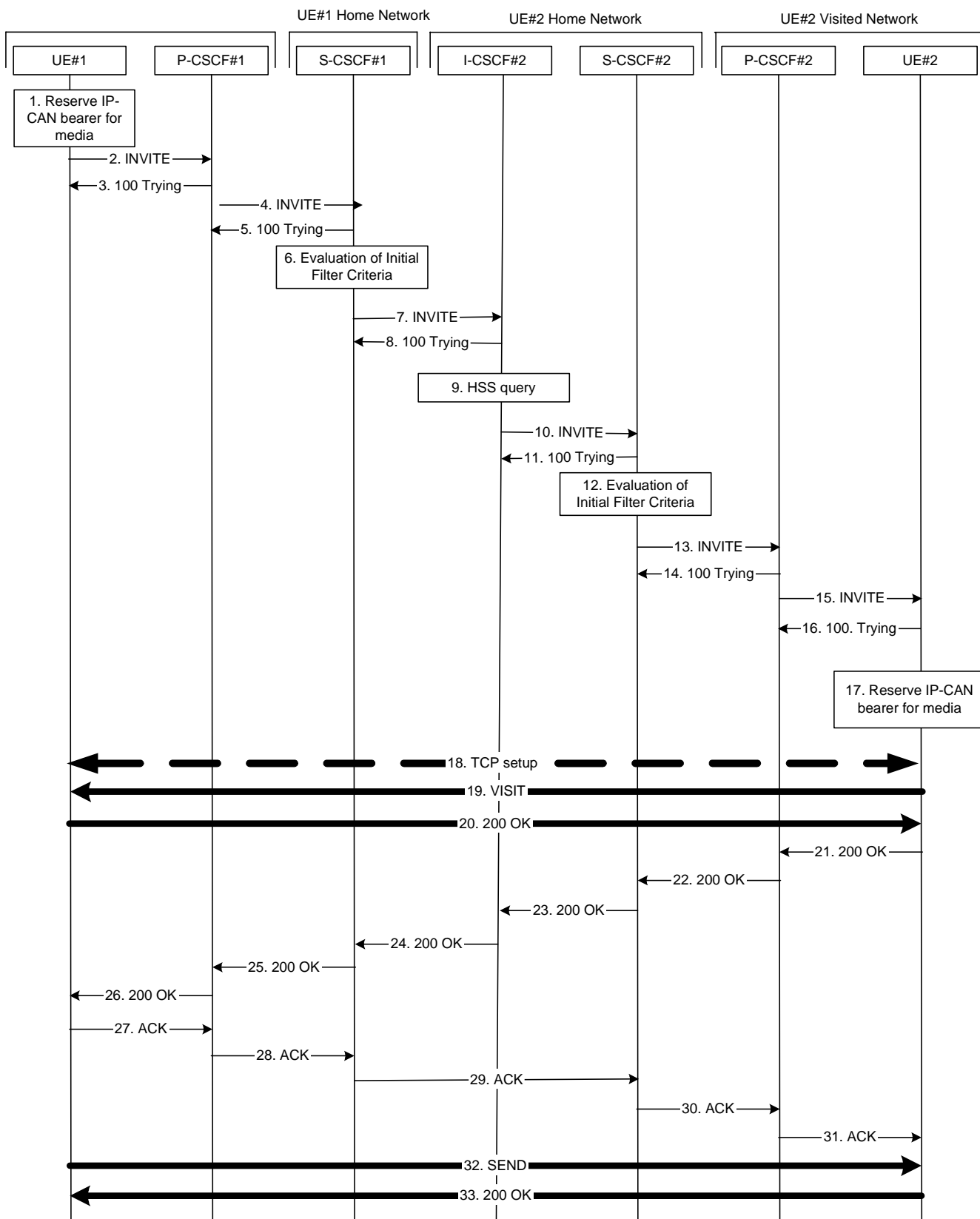


Figure A.4.2-1: Establishment of MSRP session

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+602IrT5tAFrbHLso=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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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: cb03a0s09a2sdfgk490333
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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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$
```

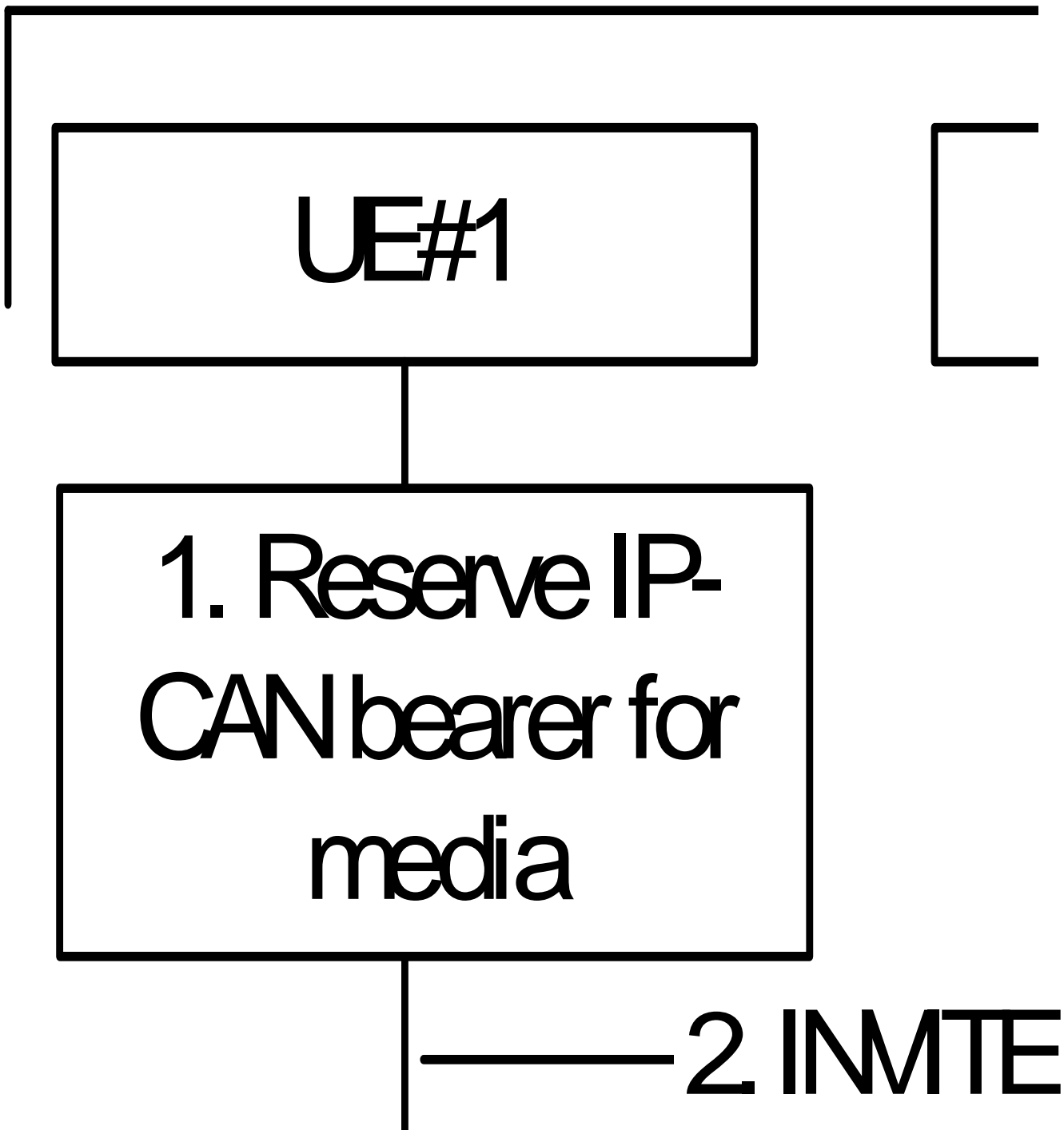
TR-ID: The transaction ID for this MSRP transaction, as received in the related MSRP request.

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

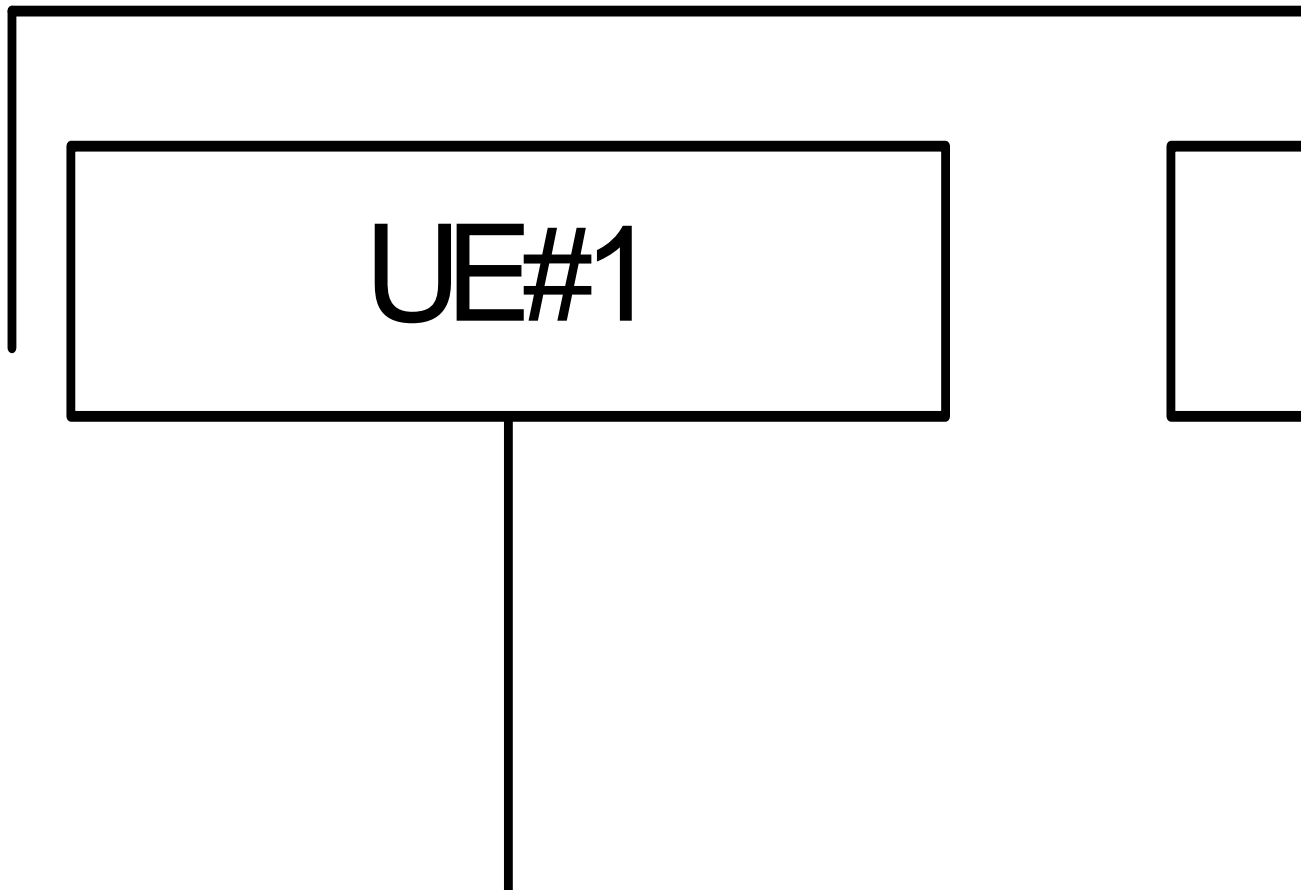


Figure A.4.3-1: Establishment of MSRP session with Intermediate Nodes

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+602IrT5tAFrbHLso=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) – 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) – 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:s09a233cbdsfjglkj490303a0@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) – 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) – 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:s09a233cbsdfglkj490303a0@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: 0s09glkj4903a2sdf33cb03a
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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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) – 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: 0s09glkj4903a2sdf33cb03a
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) – 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) – 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-icid=home1.net;
term-icid=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) – 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: 0s09glkj4903a2sdf33cb03a
Cseq: 210 ACK
Content-Length: 0
```

39. ACK request (S-CSCF#2 to P-CSCF#2) – 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) – 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) – 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+602IrT5tAFrbHLso=323551024"
From: <sip:user1_public1@home1.net>;tag=234567
To: <sip:user2_public1@home2.net>;tag=98989823
Call-ID: s09a233cbdsdfglkj490303a0
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) – 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) – 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) – 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) – 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) – 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) – 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) – 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: cb03a0s09a2sdfgkj490333
Cseq: 127 ACK
Content-Length: 0
```

52. ACK request (P-CSCF#1 to S-CSCF#1) – 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) – 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) – 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) – 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) – 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) – 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) – 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 – Call Flow N1-031677: Immediate Messaging – Call Flow reference to 24.228 N1-031722: Message Sessions in IMS – Text (created Annex B) N1-031723: Immediate Messaging – 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 – Message Session in IMS N1-040189 – Deletion of imported and unused Definitions N1-040197 – UE to UE message session flow N1-040198 – Message Session Initiation – mobile originating case N1-040199 – Message Session Initiation – mobile terminating case N1-040200 – 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 – Update of Scope - N1-040262 – Correction of Flows - N1-040280 – Editorial Changes - N1-040306 – Corections to Annex A.4.3 - N1-040307 – Corrections to Annex B - N1-040426 – SDP for session-based messaging - N1-040429 – Corrections to Annex A.1 – A.4.2 - N1-040486 – Definition of MSRP Role for AS and MRFP - N1-040488 – 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 – MSRP in AS - N1-040648 – Editorial changes to Annex A - N1-040738 – 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 – Shifting Material from Annex B to main body - N1-041036 – Corrections to Message Sessions Flows - N1-041040 – Ut for Messaging - N1-040850 – Correction of signalling flow example - N1-041037 – Establishing a session with active intermediate nodes, with originating UE hosting, and without SBLP - N1-041039 – 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.		

~~Release 6 24.247 V1.21.0 (2004-0986) 3GPP TS 24.247 V1.21.0 (2004-09) 3GPP TS 24.247 V1.21.0 (2004-086) 3GPP TS 24.247 V1.1.0 (2004-06)~~

2004-05				Version 1.2.0.1 produced to correct smaller editorial mistakes.		
2004-06				Version 1.2.1.0 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.		