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SPECIFICATIONS OF SIGNALLING SYSTEM No. 7

STAGE 3 DESCRIPTION FOR CHARGING SUPPLEMENTARY SERVICES USING SIGNALLING SYSTEM No. 7

Clause 3 – Reverse Charging (REV)

ITU-T Recommendation Q.736

(Previously "CCITT Recommendation")

FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation Q.736, clause 3 was prepared by ITU-T Study Group 11 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 17th of October 1995.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

CONTENTS

SUMMARY

Reverse Charging is a supplementary service offered to the calling and called users. It provides the calling user with the means to reverse the call charging at call set-up time or during the active phase of the call. In the latter case, it applies for the rest of the call only. It also provides the called user with the means to reverse call charging during the active phase of the call for either the rest of the call or for the entire call. It also allows for unconditional reversal of the call charging based on subscription data related to the called user.

STAGE 3 DESCRIPTION FOR CHARGING SUPPLEMENTARY SERVICES USING SIGNALLING SYSTEM No. 7

(Geneva, 1995)

3 Reverse Charging (REV)

3.1 Introduction

3.1.1 Scope

Reverse Charging (REV) is a service allowing a called user to be charged for the actual communication, that is for usage-based calls.

There are four cases of reverse charging:

- CASE A: Reverse Charging requested by the calling user at the call set-up time.
- CASE B: Reverse Charging for the rest of the call, requested by the calling user or the called user during the active phase of the call.
- CASE C: Reverse Charging for the entire call requested by the called user during the active phase of the call.
- CASE D: Reverse Charging unconditional.

The Stage 1 definitions for the Reverse Charging are given in Recommendation I.256.3 [5] and the Stage 2 service definitions including network functions are given in Recommendations Q.86.3 [6]. This Stage 3 description for Reverse Charging uses the ISDN User Part defined in Recommendations Q.730 [7], Q.761 [8], Q.762 [9], Q.763 [10], Q.764 [11] and Q.766 [12] and may use the Signalling Connection Control Part (SCCP) protocols defined in Recommendations Q.711 [13], Q.712 [14], Q.713 [15] and Q.714 [16] in order to transmit messages using end-to-end method. DSS 1 signalling information should be referred to Recommendation Q.956.3 [18].

3.1.2 References

The following Recommendations and other references contain provisions which, through reference in text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revisions; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.112 (1993), *Vocabulary of terms for ISDNs.*

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN.*

[3] ITU-T Recommendation I.210 (1993), *Principles of telecommunication services supported by an ISDN and the means to describe them.*

[4] CCITT Recommendation I.250 (1988), *Definition of supplementary services.*

[5] CCITT Recommendation I.256.3 (1992), *Reverse Charging.*

[6] ITU-T Recommendation clause 3/Q.86 (1993), *Reverse Charging (REV).*

[7] ITU-T Recommendation Q.730 (1993), *Signalling System No. 7 – ISDN supplementary services.*

[8] ITU-T Recommendation Q.761 (1993), *Functional description of the ISDN User Part of Signalling System No. 7.*

[9] ITU-T Recommendation Q.762 (1993), *General function of message and signals of the ISDN User Part of Signalling System No. 7.*

[10] ITU-T Recommendation Q.763 (1993), *Format and codes of the ISDN User Part of Signalling System No. 7.*

[11] ITU-T Recommendation Q.764 (1993), *Signalling System No. 7 – ISDN User Part signalling procedures.*

[12] ITU-T Recommendation Q.766 (1993), *Performance objectives in the integrated services digital network application.*

[13] ITU-T Recommendation Q.711 (1993), *Signalling System No. 7 – Functional description of the Signalling connection Control Part.*

[14] ITU-T Recommendation Q.712 (1993), *Signalling System No. 7 – Definition and function of SCCP messages.*

[15] ITU-T Recommendation Q.713 (1993), *Signalling System No. 7 – SCCP formats and codes.*

[16] ITU-T Recommendation Q.714 (1993), *Signalling System No. 7 – Signalling Connection Control Part procedures.*

[17] CCITT Recommendation X.208 (1988), *Specification of Abstract Syntax Notation One (ASN.1).*

[18] ITU-T Recommendation clause 3/Q.956 (1995), *Stage 3 description for charging supplementary services using DSS 1 Reverse Charging (REV).*

[19] ITU-T Recommendation X.680 (1994)/Amendment 1 (1995), *Information technology – Abstract Syntax Notation One (ASN.1) – Specification of basic notation – Amendment 1: Rules of extensibility.*

3.1.3 Terms and definitions

Throughout the Stage 3 description for Reverse Charging, the following terminology will be used:

3.1.3.1 no transfer mode: This indicates that the charging function is done at the originating side when the Reverse Charging is invoked.

3.1.3.2 transfer mode: This indicates that the charging function is done at the destination side when the Reverse Charging is invoked.

3.1.3.3 subscription option: There are two kinds of subscription option:

i) called user's subscription option;

ii) no subscription option. This means that Reverse Charging constitutes a fundamental ISDN service.

3.1.4 Abbreviations

For purpose of this Recommendation, the following abbreviations are used.

REV	Reverse Charging
ISDN	Integrated Services Digital Network
SCCP	Signalling Connection Control Part
DSS 1	Digital Subscriber Signalling System No. 1
ASN.1	Abstract Syntax Notation One
ISUP	ISDN User Part

3.2 Description

3.2.1 General description

3.2.1.1 Classification of Reverse Charging service

There are four cases of Reverse Charging:

CASE A (Reverse Charging requested by the calling user at the call set-up time)

This supplementary service allows a calling user, on a per-call basis, to request Reverse Charging at the call set-up time. The request is sent to a called user within an Initial Address Message. The called user may accept or reject the request within appropriate call control messages (i.e. Answer Message, Connect Message, Release Message). If the called user accepts the request, the network starts charging the called user with notification of acceptance to the calling user and proceeds with the call. If the called user rejects or ignores the request, the network notifies the calling user and disconnects the call.

When a calling user does not explicitly request Reverse Charging, the calling user is charged as usual.

CASE B (Reverse Charging for the rest of the call, requested by the calling user or the called user during the active phase of the call)

This supplementary service allows both a calling user and a called user, on a per-call basis, to request Reverse Charging for the rest of the call during the active phase of the call.

Requested by a calling user

The request is sent to a called user within a Facility Message. The called user may accept or reject the request within the Facility message. If the called user accepts the request, the network starts charging to the called user from that very moment, notifies acceptance to the calling user, and proceeds with the call. If the called user rejects or ignores the request, the network notifies the calling user while the existing call remains unaffected and the calling user is charged continuously.

In order to transmit the messages between the control exchanges, end-to-end signalling as defined in Recommendation Q.730 [7] (pass-along method or SCCP method) may be used if possible.

Requested by a called user

The request is sent to the network by a called user within a Facility Message. The network starts charging to the called user from that very moment with notification of acceptance to the calling and the called user, and proceeds with the call.

In order to transmit the messages between the control exchanges, end-to-end signalling as defined in Recommendation Q.730 [7] (pass-along method or SCCP method) may be used if possible.

CASE C (Reverse Charging for the entire call requested by the called user during the active phase of the call)

This supplementary service allows a called user, on a per-call basis, to request Reverse Charging for the entire call during the active phase of the call.

The request is sent to the network within a Facility Message. The network charges all usage-based charges for the entire call to the called user with notification of acceptance to the calling and the called user, and proceeds with the call.

In order to transmit the messages between the control exchanges, end-to-end signalling as defined in Recommendation Q.730 [7] (pass-along method or SCCP method) may be used if possible.

CASE D (Reverse Charging unconditional)

This service is only applicable to the called user. Regardless whether a calling/called user requests Reverse Charging or not, all usage-based charges or some of them for selected services are charged to the called user. In order to confirm that the Reverse Charging has been invoked, the originating side receives notification within answer messages (i.e. Answer Message or Connect Message) and the called user receives notification within call set-up message.

With this service the usage-based charges are charged to the called user, even if the calling user is not an ISDN user.

3.2.1.2 Calculation of the costs for a call

Making the calculations of the costs for a call based on the charging information is outside the scope of Reverse Charging service.

3.2.1.3 Allocation of the charging function for Reverse Charging

Two modes are defined for allocation of the charging function for Reverse Charging.

No Transfer Mode allocates the charging function to the originating side when Reverse Charging is invoked.

Transfer Mode allocates the charging function to the destination side when Reverse Charging is invoked.

In the case of No Transfer Mode, the control exchange at the destination side shall transfer the called user number to the originating side as required information for charging. In the case of Transfer Mode, the control exchange at the originating side shall transfer the calling user number to the destination side in the same way. This information shall be verified by the sending network in order to charge correctly.

3.2.2 Specific terminology

See 3.1.3, Terms and definitions.

3.2.3 Qualification on the applicability to Telecommunication Services

See Recommendation I.256.3 [5].

3.2.4 State definitions

Throughout the Stage 3 description for Reverse Charging, the following states are defined:

3.2.4.1 wait for REVCallingReqSetup response: This indicates that the Reverse Charging service (CASE A) was requested within an Initial address message, and the originating exchange is waiting for the response to the request.

3.2.4.2 wait for REVCallingReqSetup confirmation: This indicates that the destination exchange is received Reverse Charging request (CASE A) from the originating exchange and waiting for the response to the request from the destination side user-network interface.

3.2.4.3 wait for REVCallingReqActive response: This indicates that the Reverse Charging service (CASE B requested by the calling user) was requested by the calling user, and the originating exchange is waiting for the response to the request.

3.2.4.4 wait for REVCallingReqActive confirmation: This indicates that the destination exchange is received Reverse Charging request (CASE B requested by the calling user) from the originating exchange and waiting for the response to the request from the destination side user-network interface.

3.2.4.5 wait for REVCalledRequest response: This indicates that the destination exchange requested the control for Reverse Charging service (CASE B requested by the called user, CASE C, or CASE D) to the originating exchange, and the destination exchange is waiting for the response to the request.

3.2.4.6 wait for basic call response: This indicates that the originating exchange returns Reverse Charging service (CASE D) acceptance to the destination exchange, and the originating exchange is waiting for the basic call response (i.e. Answer message, Connect message) from destination side.

3.2.4.7 wait for basic call confirmation: This indicates that a call arrived at a called user which subscribed to Reverse Charging CASE D, the destination exchange is waiting for the basic call response from the destination side user-network interface.

3.2.4.8 active reverse charging: This indicates that a Reverse Charging has been invoked successfully in a call.

3.2.4.9 idle: This indicates that the control for the Reverse Charging service has not been performed in a call.

3.3 Operational requirements

3.3.1 Provision/withdrawal

See Recommendation I.256.3 [5] (Stage 1 definitions for Reverse Charging).

3.3.2 Requirements on the originating network side

Not applicable.

3.3.3 Requirements in the network

No specific requirements are needed in the network.

3.3.4 Requirements on the destination network side

Not applicable.

3.4 Coding requirements

Recommendation Q.763 [10] defines the messages and parameters for this service. The following messages and parameters are used to support this service. Remote operations parameter is accompanied by the Parameter compatibility information parameter.

3.4.1 Messages

Initial Address Message

– Remote operations parameter.

Answer message

– Remote operations parameter.

Connect message

– Remote operations parameter.

Release Message

– Remote operations parameter.

Facility Message

– Remote operations parameter.

3.4.2 ASE for REV

This subclause shows the definition of the operations, errors and types required for ISUP Remote operations parameter using ASN.1 as defined in Recommendations X.208 [17] and X.680 [19].

ASN.1 for REV

```
Q736-Reverse-Charging  {itu-t recommendation q 736 reverse-charging(3)
                    modules(2)        operations-and-errors(1)     version1(1)}

DEFINITIONS EXPLICIT TAGS ::=
BEGIN
IMPORTS             OPERATION, ERROR
                    FROM
                    ISUPRemoteOperations {ccitt recommendation q 763 moduleA(0)};
```

```
-- operation types
REVCallingReqSetup ::= OPERATION
        PARAMETER SEQUENCE {
            transferRequested  [0]  IMPLICIT BOOLEAN OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting Transfer mode  and sets true
            callingUserNumber  [1]  IMPLICIT UserNumber OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting Transfer mode.
            ... }
        RESULT SEQUENCE {
            transferAccepted  [0]  IMPLICIT BOOLEAN OPTIONAL,
            -- This parameter is mandatory in case of
            -- accepting Transfer mode  and sets true.
            calledUserNumber  [1]  IMPLICIT UserNumber OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting No Transfer mode.
            ... }
        ERRORS {
            userNotSubscribed,
            rejectedByNetwork,
            rejectedByUser,
            notAvailable,
            supplementaryServiceInteractionNotAllowed,
            basicServiceNotProvided,
            resourceUnavailable,
            userIgnored,
            rEVIsAlreadyRunning }

REVCallingReqActive ::= OPERATION
        PARAMETER SEQUENCE {
            transferRequested  [0]  IMPLICIT BOOLEAN OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting Transfer mode and sets true
            callingUserNumber  [1]  IMPLICIT UserNumber OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting Transfer mode.
            ... }
        RESULT SEQUENCE {
            transferAccepted  [0]  IMPLICIT BOOLEAN OPTIONAL,
            -- This parameter is mandatory in case of
            -- accepting Transfer mode  and sets true.
            calledUserNumber  [1]  IMPLICIT UserNumber OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting No Transfer mode.
            ... }
        ERRORS {
            userNotSubscribed,
            rejectedByNetwork,
            rejectedByUser,
            notAvailable,
            supplementaryServiceInteractionNotAllowed,
            basicServiceNotProvided,
            resourceUnavailable,
            userIgnored,
            rEVIsAlreadyRunning }

REVCalledRequest ::= OPERATION
           PAMETER SEQUENCE {
            transferRequested  [0]  IMPLICIT BOOLEAN OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting Transfer mode and sets true
            calledUserNumber  [1]  IMPLICIT UserNumber OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting No Transfer mode.
```

```
            partialCallOnly  [2]  IMPLICIT BOOLEAN OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting CASE B and sets true
            ... }
        RESULT SEQUENCE {
            transferAccepted  [0]  IMPLICIT BOOLEAN OPTIONAL,
            -- This parameter is mandatory in case of
            -- accepting Transfer mode and sets true.
            callingUserNumber  [1]  IMPLICIT UserNumber OPTIONAL,
            -- This parameter is mandatory in case of
            -- accepting Transfer mode,
            duration  [2]  IMPLICIT OCTET STRING SIZE 3 OPTIONAL,
            -- This parameter is mandatory in case of
            -- requesting CASE C Transfer mode,
            -- The octets represent a number of hours,
            -- minutes, and seconds in that order and
            -- maximum duration is approximately 10
            -- days.
            ... }
        ERRORS {
            rejectedByNetwork,
            notAvailable,
            supplementaryServiceInteractionNotAllowed,
            basicServiceNotProvided,
            resourceUnavailable,
            rEVIsAlreadyRunning }

-- error type definitions
UserNotSubscribed ::= ERROR
RejectedByNetwork ::= ERROR
RejectedByUser ::= ERROR
NotAvailable ::= ERROR
SupplementaryServiceInteractionNotAllowed ::= ERROR
BasicServiceNotProvided ::= ERROR
ResourceUnavailable ::= ERROR
UserIgnored ::= ERROR
REVIsAlreadyRunning ::= ERROR

-- constants and data type definitions

UserNumber ::= OCTET STRING (SIZE(2..10))
-- Formats as for Q.763 calling party number

-- object identifier path
revOID OBJECT IDENTIFIER ::= {itu-t recommendation q 736 3}

-- operation values
rEVCallingReqSetup REVCallingReqSetup ::=
            globalValue:{revOID operations-and-errors(1)
revcallingsetup(1)}
rEVCallingReqActive REVCallingReqActive ::=
            globalValue:{revOID operations-and-errors(1)
revcallingreqactive(2)}
rEVCalledRequest REVCalledRequest ::=
            globalValue:{revOID operations-and-errors(1)
revcalledrequest(3)}

-- error values
userNotSubscribed UserNotSubscribed ::=
            globalValue:{revOID operations-and-errors(1)
usernotsubscribed(4)}
rejectedByNetwork RejectedByNetwork ::=
            globalValue:{revOID operations-and-errors(1)
```

rejectedbynetwork(5)}
rejectedByUser RejectedByUser ::=
globalValue:{revOID operations-and-errors(1)
rejectedbyuser(6)}
notAvailable NotAvailable ::=
globalValue:{revOID operations-and-errors(1)
notavailable(7)}
supplementaryServiceInteractionNotAllowed SupplementaryServiceInteractionNotAllowed ::=
globalValue:{revOID operations-and-errors(1)
supplementaryserviceinteractionnotallowed(8)}
basicServiceNotProvided BasicServiceNotProvided ::=
globalValue:{revOID operations-and-errors(1)
basicservicenotprovided(9)}
resourceUnavailable ResourceUnavailable ::=
globalValue:{revOID operations-and-errors(1)
resourceunavailable(10)}
userIgnored UserIgnored ::=
globalValue:{revOID operations-and-errors(1)
userignored(11)}
rEVIsAlreadyRunning REVIsAlreadyRunning ::=
globalValue:{revOID operations-and-errors(1)
revisalreadyrunning(12)}

END -- *of module Q.736 Reverse Charging.*

3.5 Signalling requirements

3.5.1 Activation/deactivation/registration

None identified.

3.5.2 Invocation and operation

Procedures for Reverse Charging are grouped into five subclauses according to each CASE of Reverse Charging service.

In 3.5.2.1, the procedures of CASE A are described.

In 3.5.2.2, the procedures of CASE B requested by the calling user are described.

In 3.5.2.3, the procedures of CASE B requested by the called user are described.

In 3.5.2.4, the procedures of CASE C are described.

In 3.5.2.5, the procedures of CASE D are described.

3.5.2.1 Procedures for CASE A

3.5.2.1.1 Procedures at the originating exchange

3.5.2.1.1.1 Normal operation

On receipt of a reverse charging request from the originating access, the actions required at the originating exchange are as follows:

i) if the service is supported by No Transfer Mode, the originating exchange shall register static information for charging including at least called party number. Then the exchange will send an Initial Address Message including a Remote Operation parameter with REVCallingReqSetup invoke component to the succeeding exchange and change its state to wait for REVCallingReqSetup response;

ii) if the service is supported by Transfer Mode, the exchange will send an Initial Address Message including a Remote Operation parameter with REVCallingReqSetup invoke component to the succeeding exchange. The operation shall include “Transfer Requested” and “Calling User Number” parameters. The state shall be changed to wait for REVCallingReqSetup response.

When the state is in wait for REVCallingReqSetup response, on receipt of an Answer Message or a Connect Message including a Remote Operations parameter with a Return Result component from the succeeding exchange, the actions required at the originating exchange are as follows:

a) In the case where the exchange has requested the service on:

   – No Transfer Mode; or

   – Transfer Mode and "Transfer Accepted" parameter received from destination side indicates "No Transfer Mode";

   the exchange shall perform the service on No Transfer Mode. In that case, the originating exchange shall notify the acceptance to the originating access, and start charging to the called user. Then the state shall be changed to active reverse charging.

b) In the case where the "Transfer Mode" request is accepted by the destination side, the exchange shall perform the service on "Transfer Mode". In that case, the originating exchange shall notify the acceptance to the originating access, and any functions concerning charging shall not be performed. Then the state shall be changed to active reverse charging.

When the basic call is cleared, the originating exchange shall stop charging in the case of No Transfer Mode and the state shall be returned to idle.

3.5.2.1.1.2 Exceptional procedures

If the result of the validation check for supplementary service interaction indicates that supplementary service interaction is not allowed (see 3.6) the call shall be released (in this case the return error value "Supplementary Service Interaction Not Allowed" and the cause value "29: facility rejected" are sent to the originating access).

When the state is wait for REVCallingReqSetup response, in the following cases, the originating exchange shall clear the call and the state shall be returned to idle:

i) on receipt of a Release Message including a Return error within a Remote operations parameter from the succeeding exchange (in this case if this return error value is correct for REV, the same return error value and cause value are sent to the originating access, if this return error value is not correct for REV, the return error value "Not Available" and the cause value "29: facility rejected" are sent to the originating access);

ii) on receipt of a Release Message including a Reject component within a Remote operations parameter or without a Remote operations parameter from the succeeding exchange (in this case the return error value "Not Available" and the cause value "29: facility rejected" are sent to the originating access);

iii) on receipt of an Answer message/a Connect message without a Remote operations parameter (in this case the return error value "Not Available" and the cause value "29: facility rejected" are sent to the originating access);

iv) in the case that the timer to wait for REVCallingReqSetup response is expired (in this case the return error value "Not Available" and the cause value "29: facility rejected" are sent to the originating access).

Whenever the state is active reverse charging, any requests for Reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the succeeding exchange or the originating access).

3.5.2.1.2 Actions at the transit exchange

No particular actions are required at transit exchanges.

However, if the charging function is allocated at a transit exchange, the same actions as 3.5.2.1.1 and 3.5.2.1.5 are required.

3.5.2.1.3 Procedures at the outgoing international gateway exchange

In order to prevent an invocation of this service on a international call, the outgoing international gateway exchange shall clear the call with the return error "Rejected By Network" when an Initial Address Message includes an invocation of the reverse charging service. This message includes the cause value "29: facility rejected".

3.5.2.1.4 Procedures at the incoming international gateway exchange

None identified.

3.5.2.1.5 Procedures at the destination exchange

3.5.2.1.5.1 Normal operation

On receipt of an Initial Address Message including a Remote operations parameter with REVCallingReqSetup invoke component, the actions required at the destination exchange are as follows:

i) if the network provides the called user's subscription option, a validation check for the called user shall be performed;

ii) if the service is supported by No Transfer Mode or the originating exchange has not requested transfer mode, the destination exchange shall request the reverse charging to the destination access at the call set-up time and change its state to wait for REVCallingReqSetup confirmation;

iii) in the case where the originating side has requested the service on "Transfer Mode" and the destination exchange supports the mode, the service should be performed by "Transfer Mode". In this case, the destination exchange shall register the static information for charging and request the reverse charging to the destination access at the call set-up time and change its state to wait for REVCallingReqSetup confirmation.

When the state is wait for REVCallingReqSetup confirmation, on receipt of an acceptance from the destination access, the actions required at the destination exchange are as follows:

a) in the case of No Transfer Mode, the destination exchange shall send an Answer message or a Connect message including a Remote operations parameter with a Return result component to the preceding exchange. The result shall include "Called User Number" parameter. Then the state shall be changed to active reverse charging;

b) in the case of Transfer Mode, the destination exchange shall start charging to the called user. Then an Answer message or a Connect message including a Remote operations parameter with a Return result component is sent to the preceding exchange. The result shall include "Transfer Accepted" parameter. Then the state shall be changed to active reverse charging.

When the basic call is cleared, the destination exchange shall stop charging in the case of Transfer Mode and the state shall be returned to idle.

3.5.2.1.5.2 Exceptional procedures

If the result of the validation check for the called user's subscription indicates that the called user is not subscribed to this service, the call shall be released. A Release message including a Remote operations parameter with Return error component, which indicates "User Not Subscribed", is sent back to the preceding exchange. This message includes the cause value "29: facility rejected".

If the result of the validation check for the called user's subscription indicates that the called user is subscribed to this service but supplementary service interaction is not allowed (see 3.6) the call shall be released. A Release message including a Remote operations parameter with Return error component, which indicates "Supplementary Service Interaction Not Allowed", is sent back to the preceding exchange. This message includes the cause value "29: facility rejected".

When the state is wait for REVCallingReqSetup confirmation, in the following cases the destination exchange shall clear the call and state shall be returned to idle:

i) on receipt of a call clearing message including a Return error from the destination access (in this case if this Return error value is correct for REV, the same return error value and cause value are sent back to the preceding exchange, if this return error value is not correct for REV, the return error value "Not Available" and the cause value "29: facility rejected" are sent back to the preceding exchange);

ii) on receipt of a call clearing message including a Reject component from the destination access (in this case the return error value "Not Available" and the cause value "29: facility rejected" are sent back to the preceding exchange);

iii) on receipt of a call clearing message without a Return error from the destination access (in this case the return error value and the cause value sent back to the preceding exchange is specified in DSS 1 specification);

iv) on receipt of a CONNECT Message without a Return result or a Return error from the destination access (in this case the return error value "User Ignored" and the cause value "29: facility rejected" are sent back to the preceding exchange);

v) in the case that the destination DSS 1 timer is expired (in this case the return error value "Basic Service Not Provided" and the cause value "102: recovery on timer expiry" are sent back to the preceding exchange).

Whenever the state is active reverse charging, any requests for Reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the preceding exchange or the destination access).

3.5.2.2 Procedures of CASE B requested by a calling user

3.5.2.2.1 Procedures at the originating exchange

3.5.2.2.1.1 Normal operation

On receipt of a request from the originating access during the active phase of a call:

i) if the service is supported by No Transfer Mode, the originating exchange shall register static information for charging. Then a Facility Message including a Remote operations parameter with REVCallingReqActive invoke component is sent to the succeeding exchange. The timer to wait for the response shall be initiated and the state shall be changed to wait for REVCallingReqActive response;

ii) if the service is supported by Transfer Mode, a Facility Message including a Remote operations parameter with REVCallingReqActive invoke component shall be sent to the succeeding exchange. The operation shall include "Transfer Requested" and "Calling User Number" parameters. The timer to wait for the REVCallingReqActive response shall be initiated and the state shall be changed to wait for REVCallingReqActive response.

When the state is wait for REVCallingReqActive response, on receipt of a Facility Message including a Remote operations parameter with a Return result component from the succeeding exchange, the actions required at the originating exchange are as follows:

a) In the case where the exchange has requested the service on:

   – No Transfer Mode; or

   – Transfer Mode and "Transfer Accepted" parameter received from destination side indicates "No Transfer Mode";

   the exchange shall perform the service on No Transfer Mode. In that case, the originating exchange shall stop the response timer and notify the acceptance to the originating access. Any previous charges for the call will be charged to the calling user. Subsequent charges will be charged to the called user. Then the state shall be changed to active reverse charging;

b) in the case where the "Transfer Mode" request is accepted by the destination side, the exchange shall perform the service on "Transfer Mode". In that case, the originating exchange shall stop the response timer and notify the acceptance to the originating access. On the other hand, the exchange shall stop charging to the calling user. Then the state shall be changed to active reverse charging.

When the basic call is cleared, the originating exchange shall stop charging in the case of No Transfer Mode and the state shall be returned to idle.

3.5.2.2.1.2 Exceptional procedures

If the result of the validation check for supplementary service interaction indicates that supplementary service interaction is not allowed (see 3.6) the request shall be rejected (in this case the return error value "Supplementary Service Interaction Not Allowed" is sent to the originating access).

When the state is wait for REVCallingReqActive response, in the following cases the previous request shall be rejected and the state shall be returned to idle while the existing call remains unaffected:

i) on receipt of a Facility Message including a Return error within a Remote operations parameter from the succeeding exchange (in this case if this return error value is correct for REV, the same return error value is sent to the originating access, if this return error value is not correct for REV, the return error value "Not Available" is sent to the originating access);

ii) on receipt of a Facility Message including a Reject component within a Remote operations parameter or without a Remote operations parameter from the succeeding exchange (in this case the return error value "Not Available" is sent to the originating access);

iii) in the case that the timer to wait for REVCallingReqActive response is expired (in this case the return error value "Not Available" is sent to the originating access).

When the state is wait for REVCallingReqActive response, on receipt of a Release Message, the originating exchange shall clear the call with the return error "Basic Service Not Provided", and the state shall be returned to idle.

Whenever the state is in either wait for REVCallingReqActive response or active reverse charging, any requests for reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the succeeding exchange or the originating access).

3.5.2.2.2 Actions at the transit exchange

No particular actions are required at transit exchanges.

However, if the charging function is allocated at a transit exchange, the same actions as 3.5.2.2.1 and 3.5.2.2.5 are required.

3.5.2.2.3 Procedures at the outgoing international gateway exchange

In order to prevent an invocation of this service on a international call, the outgoing international gateway exchange should delete an invoke component requesting reverse charging. The exchange will return the error "Rejected By Network" to the originating exchange in a Remote operations parameter in a Facility message.

3.5.2.2.4 Procedures at the incoming international gateway exchange

None identified.

3.5.2.2.5 Procedures at the destination exchange

3.5.2.2.5.1 Normal operation

On receipt of a Facility Message including a Remote operations parameter with REVCallingReqActive invoke component during the active phase of a call, the actions required at the destination exchange are as follows:

i) if the network provides called user's subscription option, a validation check for the called user shall be performed;

ii) if the service is supported by No Transfer Mode, the destination exchange shall request the reverse charging to the destination access and change its state to wait for REVCallingReqActive confirmation;

iii) in the case where the originating side has requested the service on "Transfer Mode" and the destination exchange support the mode, the service should be performed by "Transfer Mode". In this case, the destination exchange shall register the static information for charging (i.e. Calling user number), request the reverse charging to the destination access, and change its state to wait for REVCallingReqActive confirmation.

When the state is in wait for REVCallingReqActive confirmation, on receipt of an acceptance from the destination access, the actions required at the destination exchange are as follows:

a) in the case of No Transfer Mode, the destination exchange shall send a Facility Message including a Remote operations parameter with Return result component to the preceding exchange. The result shall include "Called User Number" parameter. Then the state shall be changed to active reverse charging;

b) in the case of Transfer Mode, the destination exchange shall start charging to the called user. Then a Facility Message including a Remote operations parameter with a Return result component is sent to the preceding exchange. The result shall include "Transfer Accepted". Then the state shall be changed to active reverse charging.

When the basic call is cleared, the destination exchange shall stop charging in the case of Transfer Mode and the state shall be returned to idle.

3.5.2.2.5.2 Exceptional procedures

If the result of the validation check for the called user's subscription indicates that the called user is not subscribed to this service, a Facility Message including a Remote operations parameter with a Return error component, which indicates "user not subscribed", is sent back to the preceding exchange while the existing call remained unaffected.

If the result of the validation check for the called user's subscription indicates that the called user is subscribed to this service but supplementary service interaction is not allowed (see 3.6), a Facility Message including a Remote operations parameter with a Return error component, which indicates a Facility Message including a Remote operations parameter with a Return error component, which indicates "Supplementary Service Interaction Not Allowed", is sent back to the preceding exchange while the existing call remained unaffected.

When the state is wait for REVCallingReqActive confirmation, in the following cases the destination exchange shall send a Facility Message to the preceding exchange and the state shall be returned to IDLE while the existing call remains unaffected:

i) on receipt of a facility Message including a Return error from the destination access (in this case if this Return error value is correct for REV, the same return error value is sent back to the preceding exchange, if this return error value is not correct for REV, the return error value "Not Available" is sent back to the preceding exchange);

ii) on receipt of a facility Message including a Reject component from the destination access (in this case the return error value "Not Available" is sent back to the preceding exchange);

iii) in the case that the destination DSS 1 timer is expired (in this case the return error value "User Ignored" is sent back to the preceding exchange).

When the state is wait for REVCallingReqActive confirmation, on receipt of a call clearing message from the destination access, the destination exchange shall clear the call with the return error "Basic Service Not Provided", and the state shall be returned to idle.

Whenever the state is in either wait for REVCallingReqActive confirmation or active reverse charging, any requests for Reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the preceding exchange or the destination access).

3.5.2.3 Procedures of CASE B requested by the called user

3.5.2.3.1 Procedures at the originating exchange

3.5.2.3.1.1 Normal operation

On receipt of a Facility Message including a Remote operations parameter with REVCalledRequest invoke component including a "Partial Call Only" during the active phase of a call, the actions required at the originating exchange are as follows:

i) if the service is supported by No Transfer Mode, the originating exchange shall register the static information for charging (i.e. Called user number) and send a Facility Message including a Return result component within a Remote operations parameter to the succeeding exchange. Then the originating exchange shall notify the invocation to the originating access and the exchange shall continue charging while the charged user is changed from the calling user to the called user which is included in the Invoke component. The state shall be changed to Active Reverse Charging;

ii) in the case where the destination side has requested the service on "Transfer Mode" and the originating exchange support the mode, the service should be performed on "Transfer Mode". In this case the originating exchange shall send a Facility Message including a Remote operations parameter with a Return result component to the succeeding exchange. The result shall include "Transfer Accepted" and "Calling User Number" parameters. Then the originating exchange shall notify the invocation to the originating access and any functions concerning charging shall not be performed. And the state shall be changed into Active Reverse Charging.

When the basic call is cleared, the originating exchange shall stop charging in the case of No Transfer Mode and the state shall be returned to idle.

3.5.2.3.1.2 Exceptional procedures

If the result of the validation check for supplementary service interaction indicates that supplementary service interaction is not allowed (see 3.6), the request shall be rejected while the existing call remains unaffected (in this case the return error value "Supplementary Service Interaction Not Allowed" is sent to the succeeding exchange),

Whenever the state is active reverse charging, any request for reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the succeeding exchange or the originating access).

3.5.2.3.2 Actions at the transit exchange

No particular actions are required at intermediate exchanges.

However, if the charging function is allocated at the transit exchange, the same actions as 3.5.2.3.1 and 3.5.2.3.5 are required.

3.5.2.3.3 Procedures at the outgoing international gateway exchange

None identified.

3.5.2.3.4 Procedures at the incoming international gateway exchange

In order to prevent a invocation of this service on a international call, the incoming international gateway exchange should delete an invoke component requesting reverse charging. The exchange will return the error "Rejected By Network" to the destination exchange in a Remote operations parameter an a Facility message.

3.5.2.3.5 Procedures at the destination exchange

3.5.2.3.5.1 Normal operation

On receipt of a reverse charging request from the destination access during the active phase of a call, the actions required at the destination exchange are as follows:

i) if the network provides called user's subscription option, a validation check for the called user's subscription shall be performed;

ii) if the service is supported by No Transfer Mode, the destination exchange shall send a Facility Message including a Remote operations parameter with REVCalledRequest invoke component to the preceding exchange. The operation shall include "Called User Number" and "Partial Call Only" parameters. Then the state shall be changed to wait for REVCalledRequest response;

iii) if the service is supported by Transfer Mode, the destination exchange shall send a Facility Message including a Remote operations parameter with REVCalledRequest invoke component to the preceding exchange. The operation shall include "Transfer Requested" and "Partial Call Only" parameter. Then the state shall be changed to wait for REVCalledRequest response.

When the state is wait for REVCalledRequest response, on receipt of a Facility Message including a Remote operations parameter with a Return result component from the preceding exchange, the actions required at the destination exchange are as follows:

a) In the case where the exchange has requested the service on:

   – No Transfer Mode; or

   – Transfer Mode and "Transfer Accepted" parameter received from originating side indicates "No Transfer Mode";

   the exchange shall perform the service on No Transfer Mode. In that case, the exchange shall notify the acceptance to the destination access. Then the state shall be changed to active reverse charging.

b) In the case where the "Transfer Mode" request is accepted by the originating side, the exchange shall perform the service on "Transfer Mode". In that case, the exchange shall start charging to the called user from that very moment and notify the acceptance to the destination access. Then the state shall be changed to active reverse charging.

When the basic call is cleared, the destination exchange shall stop charging in the case of Transfer Mode and the state shall be returned to idle.

3.5.2.3.5.2 Exceptional procedures

In the following cases the request shall be rejected while the existing call remains unaffected:

i) in the case that the result of the validation check for the called user's subscription indicates that the called user is not subscribed to this service (in this case the return error value "User Not Subscribed" is sent to the destination access);

ii) in the case that the result of the validation check for the called user's subscription indicates that the called user is subscribed to this service but supplementary service interaction is not allowed (see 3.6, in this case the return error value "Supplementary Service Interaction Not Allowed" is sent to the destination access).

When the state is in wait for REVCalledRequest response, in the following cases the previous request shall be rejected and the state shall be returned to idle while the existing call remains unaffected:

a) on receipt of Facility Message including a Return error from the preceding exchange (in this case if this Return error value is correct for REV, the same return error value is sent back to the destination access, if this return error value is not correct for REV, the return error value "Not Available" is sent back to the destination access);

b) on receipt of a facility Message including a Reject component from the preceding exchange (in this case the return error value "Not Available" is sent back to the destination access);

c) in the case where the timer to wait for REVCalledRequest response is expired (in this case the return error value "Not Available" is sent back to the destination access).

When the state is wait for REVCalledRequest response, on receipt of a Release Message from the preceding exchange, the destination exchange shall clear the call with the return error "Basic Service Not Provided", and the state shall be returned to idle.

Whenever the state is active reverse charging, any request for reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the preceding exchange or the destination access).

3.5.2.4 Procedures of CASE C

3.5.2.4.1 Procedures at the originating exchange

3.5.2.4.1.1 Normal operation

On receipt of a Facility Message including a Remote operations parameter with REVCalledRequest invoke component during the active phase of a call, the actions required at the originating exchange are as follows:

i) if the service is supported by No Transfer Mode, the originating exchange shall register the static information for charging (i.e., Called user number) and send a Facility Message including a Return result component within a Remote operations parameter to the succeeding exchange. Then the originating exchange shall notify the invocation to the originating access and the exchange shall continue charging while the charged user is changed from the calling user to the called user which is included in the Invoke component. The state shall be changed to Active Reverse Charging;

ii) in the case where the destination side has requested the service on "Transfer Mode" and the originating exchange support the mode, the service should be performed on "Transfer Mode". In this case the originating exchange shall send a Facility Message including a Remote operations parameter with a Return result component to the succeeding exchange. The result shall include "Transfer Accepted", "Calling User Number", and "Duration" parameters. Then the originating exchange shall notify the invocation to the originating access and any functions concerning charging shall not be performed. And the state shall be changed to Active Reverse Charging.

When the basic call is cleared, the originating exchange shall stop charging in the case of No Transfer Mode and the state shall be returned to idle.

3.5.2.4.1.2 Exceptional procedures

If the result of the validation check for supplementary service interaction indicates that supplementary service interaction is not allowed (see 3.6), the request shall be rejected while the existing call remains unaffected (in this case the return error value "Supplementary Service Interaction Not Allowed" is sent to the succeeding exchange).

Whenever the state is active reverse charging, any request for reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the succeeding exchange or the originating access).

3.5.2.4.2 Actions at the transit exchange

No particular actions are required at intermediate exchanges.

However, if the charging function is allocated at the transit exchange, the same actions as 3.5.2.4.1 and 3.5.2.4.5 are required.

3.5.2.4.3 Procedures at the outgoing international gateway exchange

None identified

3.5.2.4.4 Procedures at the incoming international gateway exchange

In order to prevent an invocation of this service on a international call, the incoming international gateway exchange should delete an invoke component requesting the reverse charging. The exchange will return the error value "Rejected By Network" to the destination exchange in the Remote operations parameter in a Facility message.

3.5.2.4.5 Procedures at the destination exchange

3.5.2.4.5.1 Normal operation

On receipt of a reverse charging request from the destination access during the active phase of a call, the actions required at the destination exchange are as follows:

i) if the network provides called user's subscription option, a validation check for the called user's subscription shall be performed;

ii) if the service is supported by No Transfer Mode, the destination exchange shall send a Facility Message including a Remote operations parameter with REVCalledRequest invoke component to the preceding exchange. The operation shall include "Called User Number" parameter. Then the state shall be changed to wait for REVCalledRequest response;

iii) if the service is supported by Transfer Mode, the destination exchange shall send a Facility Message including a Remote operations parameter with REVCalledRequest invoke component to the preceding exchange. The operation shall include "Transfer Requested". Then the state shall be changed to wait for REVCalledRequest response.

When the state is wait for REVCalledRequest response, on receipt of a Facility Message including a Remote operations parameter with a Return result component from the preceding exchange, the actions required at the destination exchange are as follows:

a) In the case where the exchange has requested the service on:

   – No Transfer Mode; or

   – Transfer Mode and "Transfer Accepted" parameter received from originating side indicates "No Transfer Mode";

   the exchange shall perform the service on No Transfer Mode. In that case, the exchange shall notify the acceptance to the destination access. Then the state shall be changed to active reverse charging.

b) In the case where the "Transfer Mode" request is accepted by the originating side, the exchange shall perform the service on "Transfer Mode". In that case, the exchange shall perform charging the entire call to the called user by using "Calling User Number" and "Duration" parameters and notify the acceptance to the destination access. Then the state shall be changed to active reverse charging.

When the basic call is cleared, the destination exchange shall stop charging in the case of Transfer Mode and the state shall be returned to idle.

3.5.2.4.5.2 Exceptional procedures

In the following cases the request shall be rejected while the existing call remains unaffected:

i) in the case that the result of the validation check for the called user's subscription indicates that the called user is not subscribed to this service (in this case the return error value "User Not Subscribed" is sent to the destination access);

ii) in the case that the result of the validation check for the called user's subscription indicates that the called user is subscribed to this service but supplementary service interaction is not allowed (see 3.6, in this case the return error value "Supplementary Service Interaction Not Allowed" is sent to the destination access).

When the state is in wait for REVCalledRequest response, in the following cases the previous request shall be rejected and the state shall be returned to idle while the existing call remains unaffected:

a) on receipt of Facility Message including a Return error from the preceding exchange (in this case if this Return error value is correct for REV, the same return error value is sent back to the destination access, if this return error value is not correct for REV, the return error value "Not Available" is sent back to the destination access);

b) on receipt of a facility Message including a Reject component from the preceding exchange (in this case the return error value "Not Available" is sent back to the destination access);

c) in the case where the timer to wait for REVCalledRequest response is expired (in this case the return error value "Not Available" is sent back to the destination access).

When the state is wait for REVCalledRequest response, on receipt of a Release Message from the preceding exchange, the destination exchange shall clear the call with the return error "Basic Service Not Provided", and the state shall be returned to idle.

Whenever the state is active reverse charging, any request for reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the preceding exchange or the destination access).

3.5.2.5 Procedures of CASE D

3.5.2.5.1 Procedures at the originating exchange

3.5.2.5.1.1 Normal operation

On receipt of a Facility Message including a Remote operations parameter with REVCalledRequest invoke component during the state of wait for Answer Message from the succeeding exchange, the actions required at the originating exchange are as follows:

i) if the service is supported by No Transfer Mode, the originating exchange shall register the static information for charging (i.e. Called user number) and send a Facility Message including a Return result component within a Remote operations parameter to the succeeding exchange. The state shall be changed to wait for basic call response. On receipt of an Answer Message or a Connect Message from the succeeding exchange, the originating exchange shall notify the invocation to the originating access, and start charging to the called user. The state shall be changed to active reverse charging;

ii) in the case where the destination side has requested the service on "Transfer mode" and the originating exchange support the mode, the service should be performed on "Transfer Mode". In this case, the originating exchange shall send a Facility Message including a Remote operations parameter with a Return result component to the succeeding exchange. The result shall include "Transfer Accepted" and "Calling User Number" parameters. The state shall be changed to wait for basic call response. On receipt of an Answer Message or a Connect Message from the succeeding exchange, the originating exchange shall notify the invocation to the originating access and any functions concerning charging shall not be performed. The state shall be changed to active reverse charging.

When the basic call is cleared, the originating exchange shall stop charging in the case of No Transfer Mode and the state shall be returned into idle.

3.5.2.5.1.2 Exceptional procedures

If the result of the validation check for supplementary service interaction indicates that supplementary service interaction is not allowed (see 3.6), the request shall be rejected while the existing call remains unaffected (in this case the return error value "Supplementary Service Interaction Not Allowed" is sent to the succeeding exchange).

When the state is wait for basic call response, on receipt of a Release Message from the succeeding exchange or a call clearing message from origination access, the call shall be released and state shall be returned to idle.

Whenever the state is active reverse charging, any request for reverse charging shall be rejected (in this case the return error value "REV Is Already Running" is sent to the succeeding exchange or the originating access).

3.5.2.5.2 Actions at the transit exchange

No particular actions are required at intermediate exchanges.

However, if the charging function is allocated at the transit exchange, the same actions as 3.5.2.5.1 and 3.5.2.5.5 are required.

3.5.2.5.3 Procedures at the outgoing international gateway exchange

None identified.

3.5.2.5.4 Procedures at the incoming international gateway exchange

In order to prevent an invocation of this service on a international call, the incoming international gateway exchange should clear the call with the return error "Rejected By Network" when a Facility Message includes an invoke component for the reverse charging. This message includes the cause value "29: facility rejected".

3.5.2.5.5 Procedures at the destination exchange

3.5.2.5.5.1 Normal operation

The validation check for the called user's subscription shall always be performed in order to realize CASE D. If the called user is subscribed to the Reverse Charging CASE D, all usage-based charges or some of them for selected services are charged to the called user. In this case, at the destination exchange the following actions are required:

i) if the service is supported by No Transfer Mode, the destination exchange shall send a Facility Message including a Remote operations parameter with REVCalledRequest invoke component to the preceding exchange. The operation shall include "Called User Number". Then the state shall be changed to wait for REVCalledRequest response;

ii) if the service is supported by Transfer Mode, the destination exchange shall send a Facility Message including a Remote operations parameter with REVCalledRequest invoke component to the preceding exchange. The operation shall include "Transfer Requested". Then the state shall be changed to wait for REVCalledRequest response.

When the state is wait for REVCalledRequest response, on receipt of a Facility Message including a Remote operations parameter with a Return result component from the preceding exchange, then the state shall be changed to wait for basic call confirmation and the following actions are required at the destination exchange:

a) In the case where the exchange has requested the service on:

   – No Transfer Mode; or

   – Transfer Mode and "Transfer Accepted" parameter received from originating side indicates "No Transfer Mode";

   the exchange shall perform the service on No Transfer Mode. In that case, the exchange shall notify the acceptance to the destination access. Then the state shall be changed to active reverse charging.

b) In the case where the "Transfer Mode" request is accepted by the originating side, the exchange shall perform the service on "Transfer Mode". In that case, on receipt of a response from the destination access, the exchange shall start charging to the called user. Then the state shall be changed to active reverse charging.

When the basic call is cleared, the destination exchange shall stop charging in the case of Transfer Mode and the state shall be returned to idle.

3.5.2.5.5.2 Exceptional procedures

If the result of the validation check for supplementary service interaction indicates that supplementary service interaction is not allowed (see 3.6), the destination exchange shall clear the call with the cause value “29: facility rejected”.

When the state is wait for REVCalledRequest response, in the following cases the previous request shall be rejected and the state shall be returned to idle and the call is cleared with the cause value “29: facility rejected":

i) on receipt of Facility Message including a Return error or a Reject component from the preceding exchange;

ii) in the case where the timer to wait for REVCalledRequest response is expired.

When the state is wait for basic call confirmation, on receipt of a Release Message from the proceeding exchange or a call clearing message from destination access, the call shall be released and state shall be returned to idle.

Whenever the state is active reverse charging, any request for reverse charging shall be rejected (in this case the return error value “REV Is Already Running” is sent to the preceding exchange or the destination access).

3.6 Interaction with other supplementary services

3.6.1 Call Waiting (CW)

No impact on ISUP.

3.6.2 Call Transfer (CT)

Not applicable at this time.

3.6.3 Connected Line Identification Presentation (COLP)

No impact on ISUP.

3.6.4 Connected Line Identification Restriction (COLR)

No impact on ISUP.

3.6.5 Calling Line Identification Presentation (CLIP)

No impact on ISUP.

3.6.6 Calling Line Identification Restriction (CLIR)

No impact on ISUP.

3.6.7 Closed User Group (CUG)

No impact on ISUP.

3.6.8 Conference Calling (CONF)

No impact on ISUP.

3.6.9 Direct-Dialling-In (DDI)

No impact on ISUP.

3.6.10 Call diversion services

Where charging on diverted calls occurs on a per-call leg basis, Reverse charging should occur only on the leg on which it is requested.

1) *REV is requested by the diverted call calling user*

   - CASE A:

     If CASE A is requested by the originating user of a diverted call, the diverting exchange shall send a Answer message or Connect message including the Remote operations parameter with Return error component indicating "Supplementary Service Interaction Not Allowed" unless:

     – CASE D applies at the call diversion served user;

     – the network has been informed by the call diversion served user that this charge transfer is allowed.

   - CASE B requested by the calling user:

     CASE B is requested by the calling user of a diverted call, the exchange receiving the request (i.e. the diverting exchange) shall send a Facility message including the Remote operations parameter with Return error component indicating "Supplementary Service Interaction Not Allowed".

   - CASE B requested by the called user, CASE C and CASE D:

     – Not applicable.

2) *REV is requested by the call diversion served user*

   - CASE A, CASE B and CASE C:

     – Not applicable.

   - CASE D:

     – No impact on ISUP.

3) REV is requested by forwarded to user

   - CASE A and CASE B requested by the calling user:

     – Not applicable.

   - CASE B requested by the called user, CASE C and CASE D:

     – No impact on ISUP.

3.6.11 Line Hunting (LH)

No impact on ISUP.

3.6.12 Three-Party Service (3PTY)

No impact on ISUP.

3.6.13 User-to-User Signalling (UUS)

No impact on ISUP.

NOTE – The charging control exchange is required to charge UUS according to the following:

CASE A: UUS is charged to the called user.

CASE B: Before the REV acceptance, UUS is based on normal charging principle. After the REV acceptance, UUS is charged to the called user.

CASE C: UUS is charged to the called user.

CASE D: UUS is charged to the called user.

3.6.14 Multiple Subscriber Number (MSN)

No impact on ISUP.

3.6.15 Call Hold (HOLD)

No impact on ISUP.

3.6.16 Advice Of Charge (AOC)

Not applicable at this time.

3.6.17 Sub-address (SUB)

No impact on ISUP.

3.6.18 Terminal Portability (TP)

No impact on ISUP.

3.6.19 Completion of Calls to Busy Subscriber (CCBS)

Not applicable at this time.

3.6.20 Malicious Call Identification (MCID)

No impact on ISUP.

3.6.21 Reverse Charging (REV)

In the case of collision between case B requested by calling user and case B requested by called user, this handling is the matter of network operator.

NOTE – In the case of collision between case B requested by calling user and case C, the originating exchange accepts the request and the destination exchange rejects the request by sending Facility Message including the error value "supplementary service interaction not allowed".

3.6.22 Multi-level Precedence and Preemption (MLPP)

No impact on ISUP.

3.6.23 Private Numbering Plan (PNP)

Not applicable at this time.

3.6.24 International telecommunication charge card calling

Not applicable at this time.

3.7 Interactions with other networks

In the case of interworking with a network not to support this service, there are the following two possibilities:

i) the Remote operations parameter is discarded by the network. In this case, a timer to wait for the response is expired at the requesting exchange and this service is rejected;

ii) the Gateway exchange returns explicit rejection (in this case the return error value "Rejected By Network" is sent back to the preceding exchange).

3.8 Signalling flows

Successful signalling flows for all CASEs are shown in Figures 3-1 to 3-10.

3.9 Parameter values (Timers)

The following timers are defined for each CASE in order to confirm the capability of the remote node or user for a service request;

- For wait for REVCallingReqSetup response:

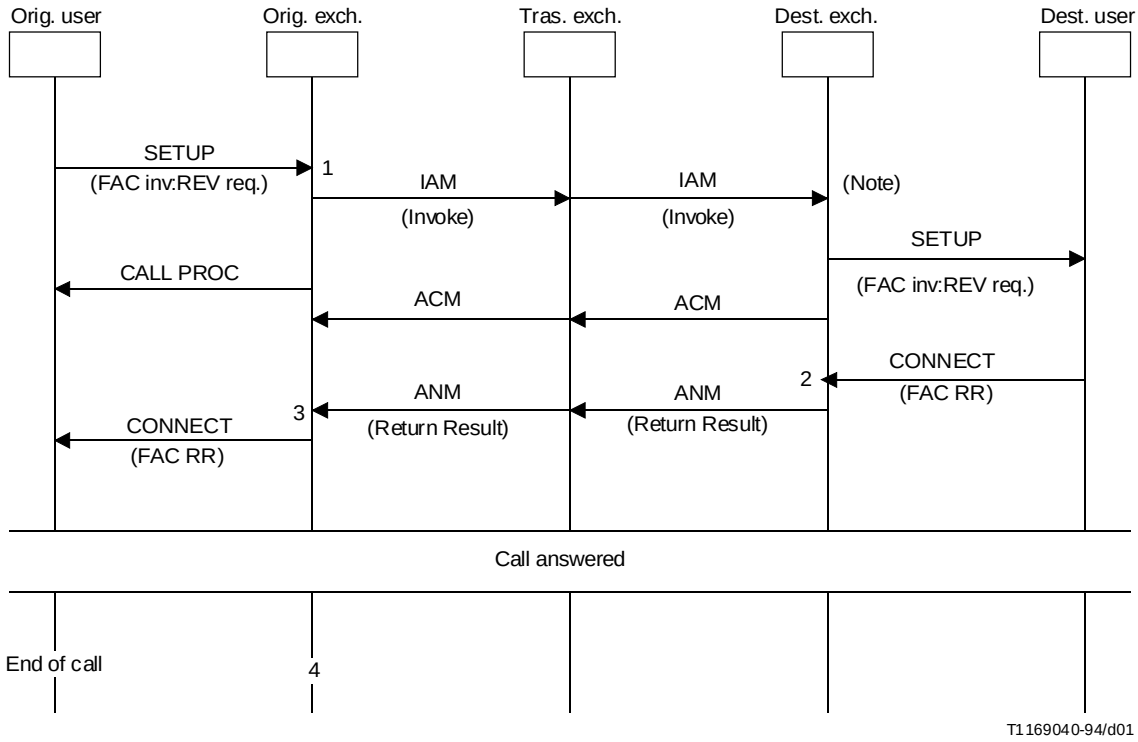
  The timer value is the same as basic call timer to wait for Answer message.

- For wait for REVCallingReqActive response:

  30 seconds.

- For wait for REVCalledRequest response:

  The timer value is national option.



Action 1 – Register static information for charging including called party number.

Action 2 – Send called party number.

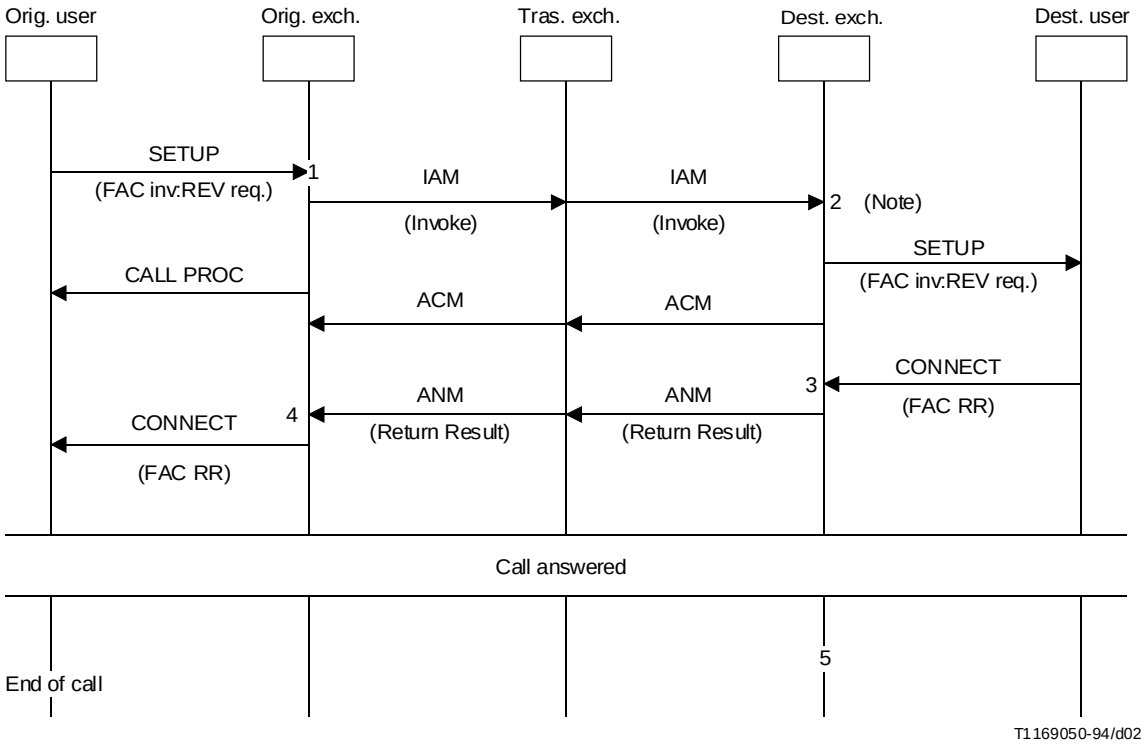
Action 3 – Collect dynamic information for communication.

Action 4 – Stop collecting dynamic information.

NOTE – Validation check for called user's subscription may be performed when the service is provided by subscription basis.

FIGURE 3-1/Q.736

Message flow for CASE A (No Transfer Mode)



Action 1 – Send calling party number and Transfer Mode request.

Action 2 – Register static information for charging.

Action 3 – Collect dynamic information for communication.

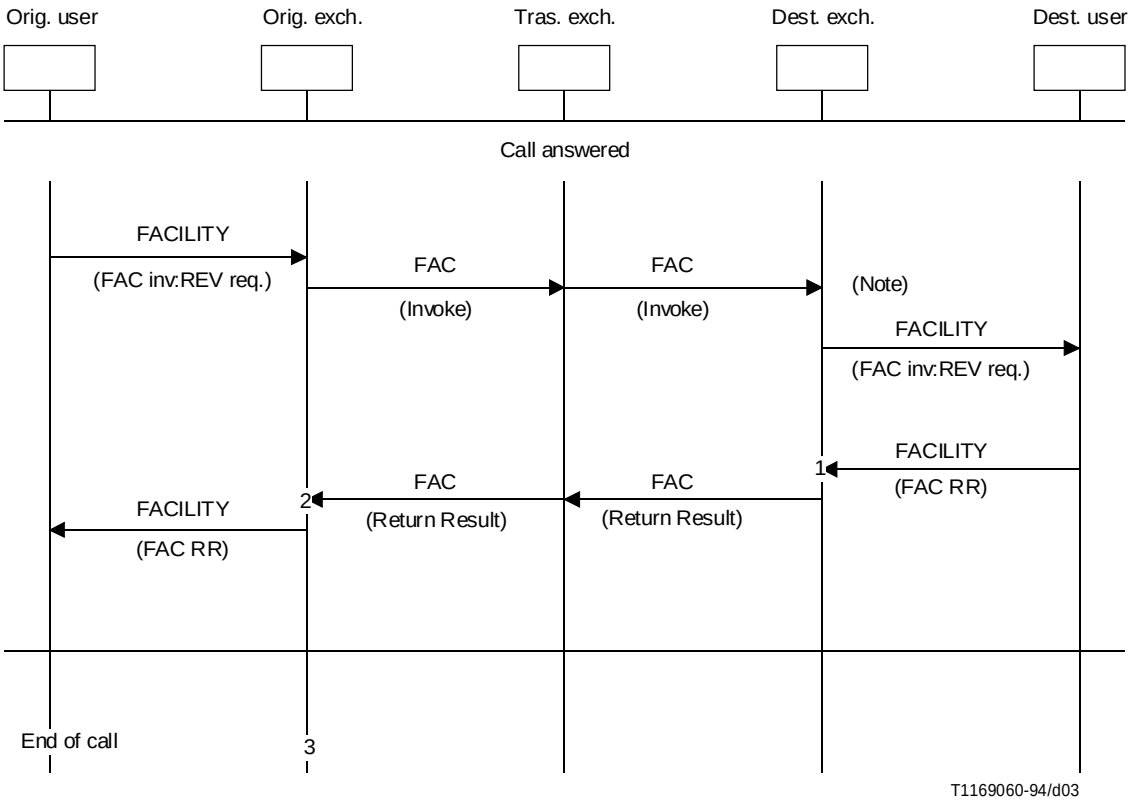
Action 4 – Any operations concerning charging are not performed.

Action 5 – Stop collecting dynamic information and send Transfer Mode acceptance.

NOTE – Validation check for called user's subscription may be performed when the service is provided by subscription basis.

FIGURE 3-2/Q.736

Message flow for CASE A (Transfer Mode)



Action 1 – Send calling party number.

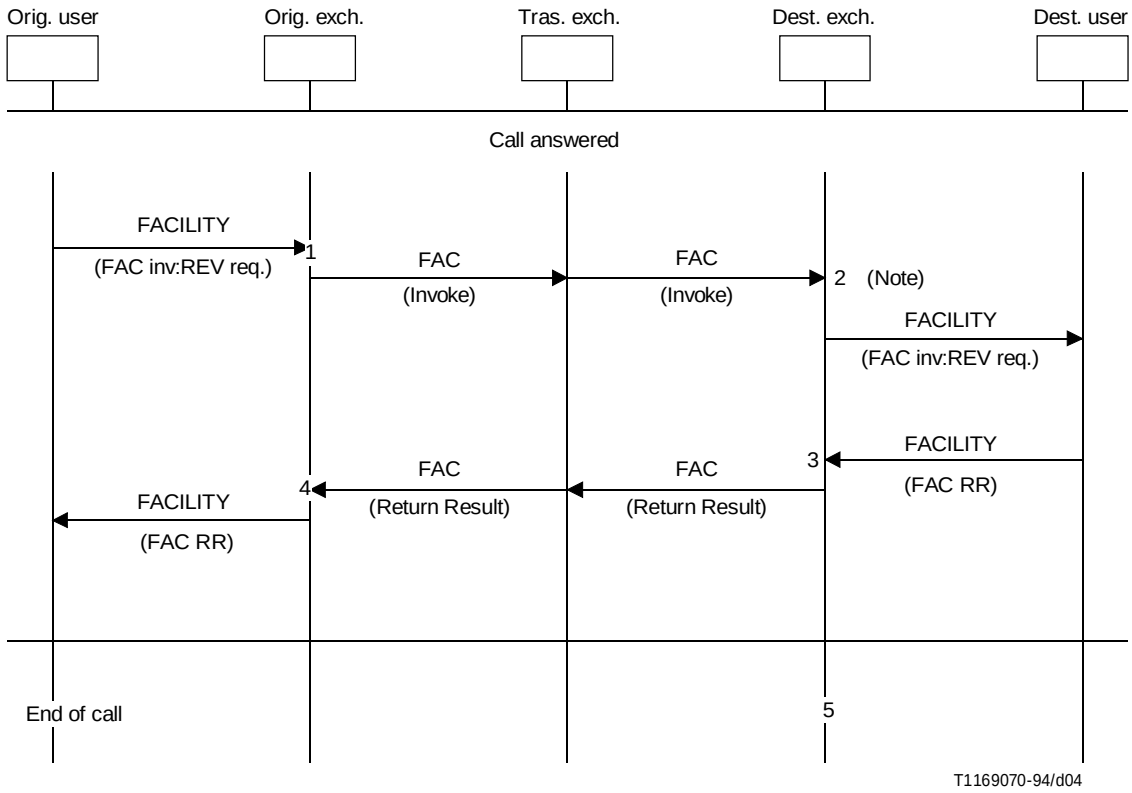
Action 2 – After change charged user from originating user to destination user, continue to collect dynamic information for communication.

Action 3 – Stop collecting dynamic information.

NOTE – Validation check for called user's subscription may be performed when the service is provided by subscription basis.

FIGURE 3-3/Q.736

Message flow for CASE B requested by calling user (No Transfer Mode)



Action 1 – Send calling party number and Transfer Mode request.

Action 2 – Register static information for charging.

Action 3 – Collect dynamic information for communication and send Transfer Mode acceptance.

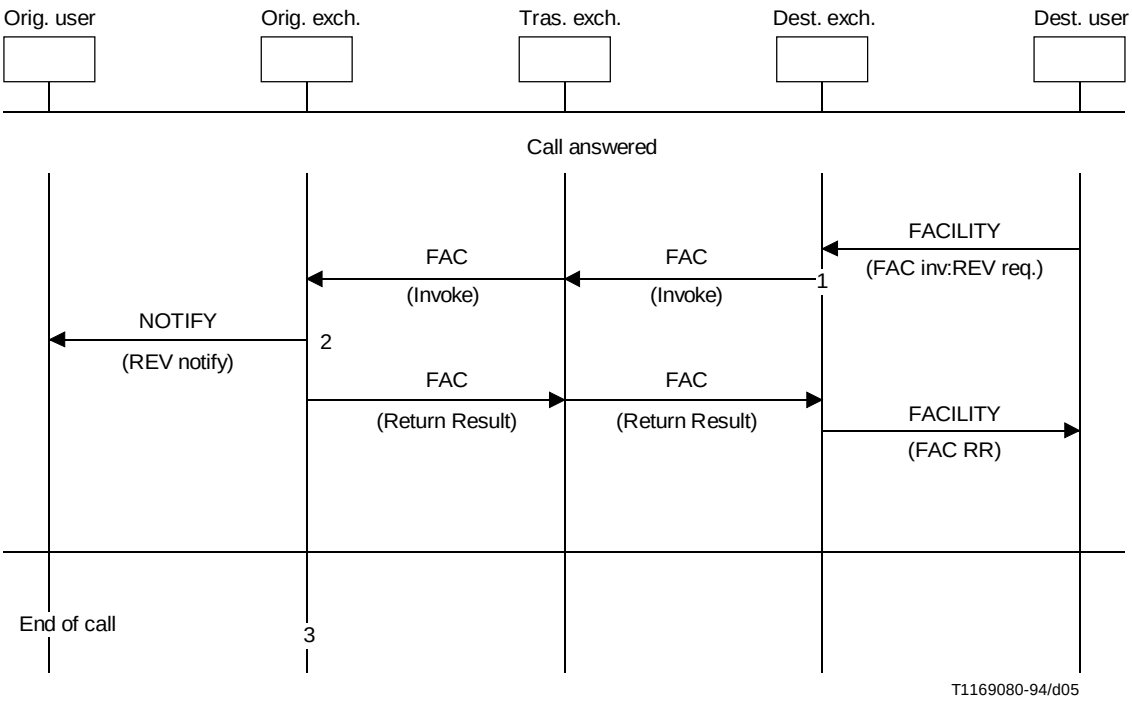
Action 4 – Stop collect dynamic information for communication.

Action 5 – Stop collecting dynamic information.

NOTE – Validation check for called user's subscription may be performed when the service is provided by subscription basis.

FIGURE 3-4/Q.736

Message flow for CASE B requested by calling user (Transfer Mode)



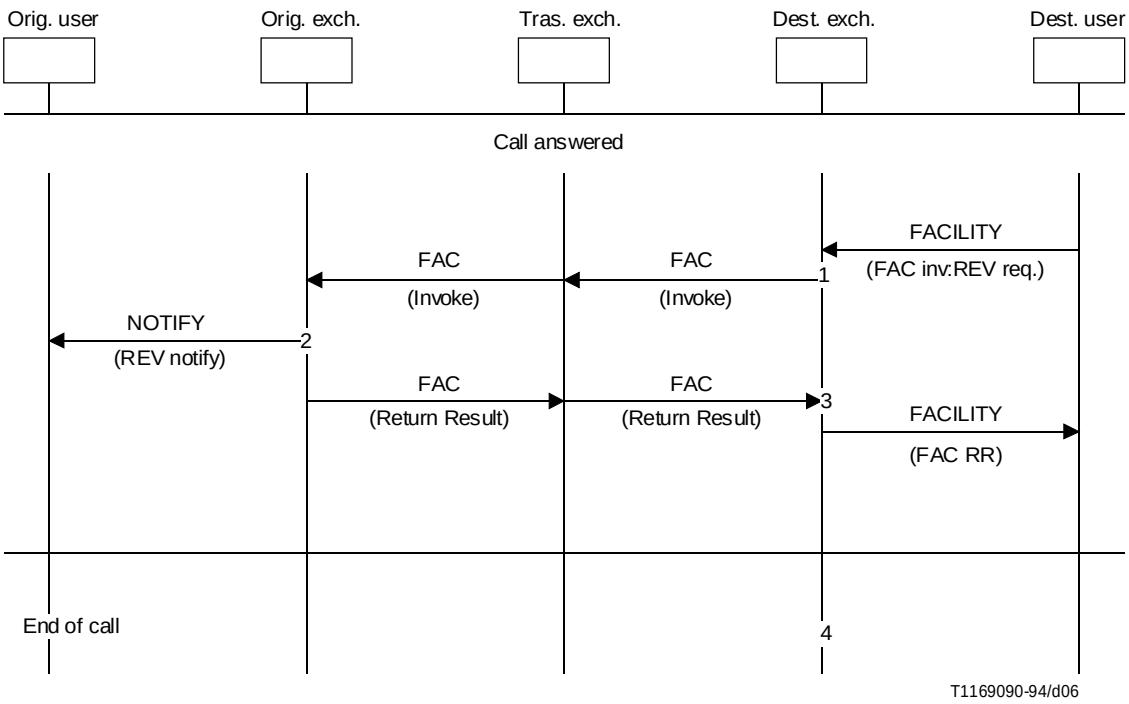
Action 1 – Send called party number and partial reverse charging request.

Action 2 – After change charged user from originating user to destination user, continue to collect dynamic information for communication.

Action 3 – Stop collect dynamic information.

FIGURE 3-5/Q.736

Message flow for CASE B requested by called user (No Transfer Mode)



Action 1 – Send Transfer Mode request and partial reverse charging request.

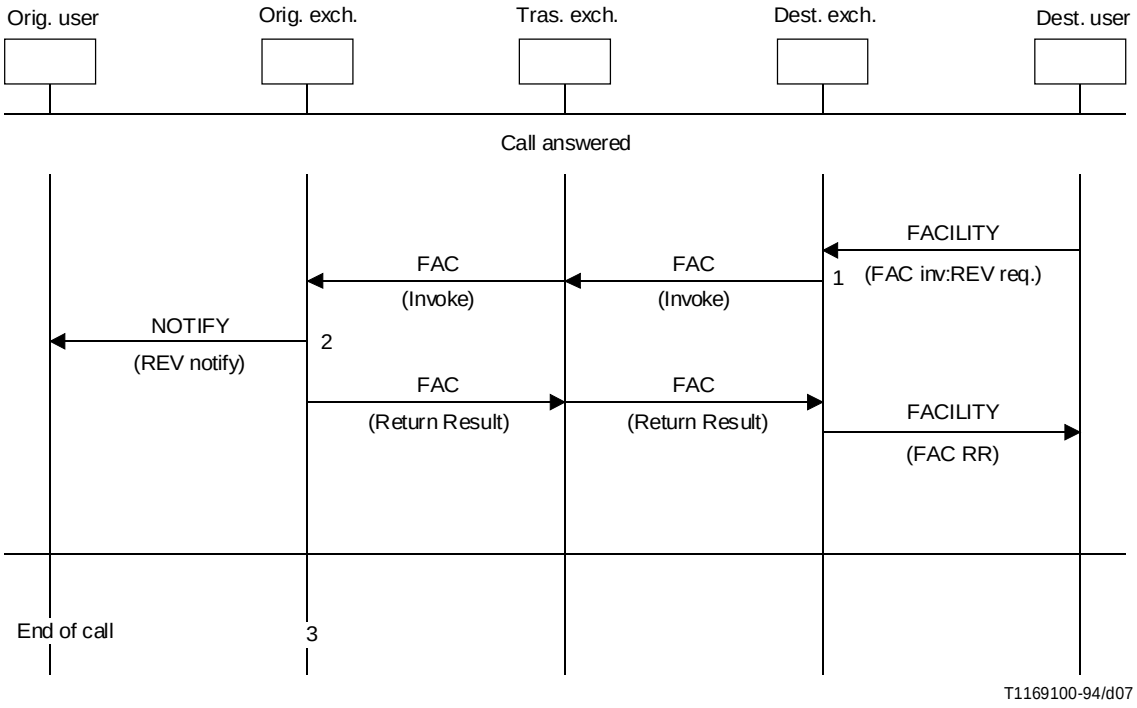
Action 2 – Send calling user number and Transfer Mode acceptance, and stop collect dynamic information for communication.

Action 3 – Collect dynamic information.

Action 4 – Stop collect dynamic information.

FIGURE 3-6/Q.736

Message flow for CASE B requested by called user (Transfer Mode)



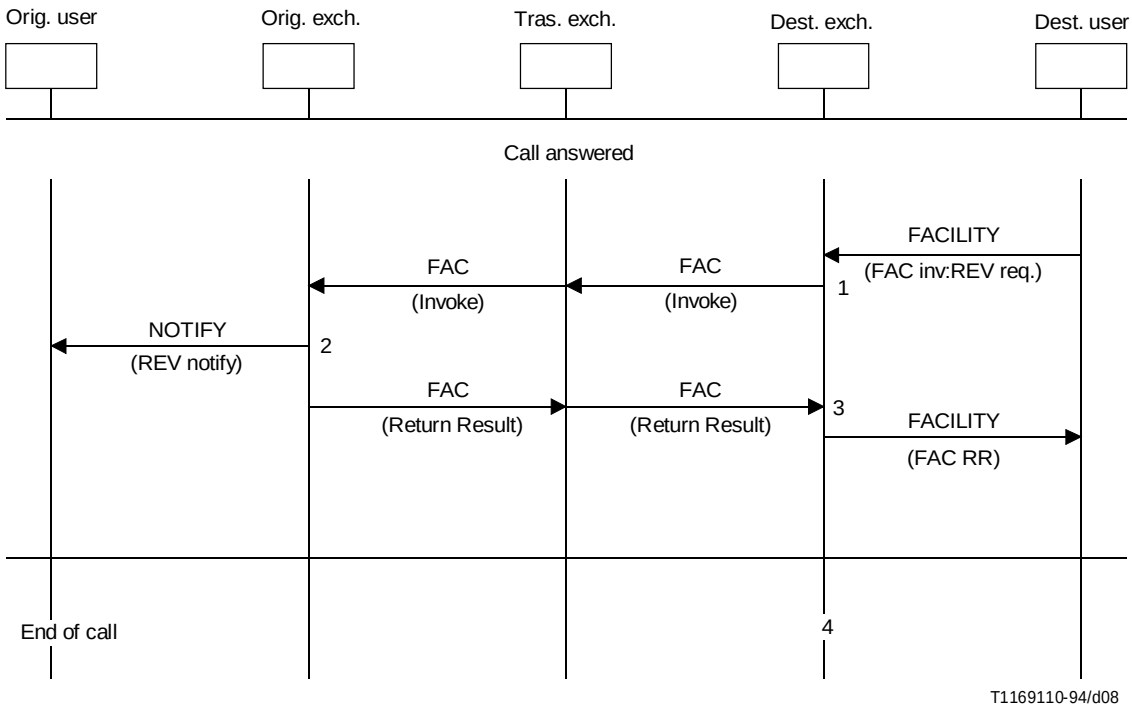
Action 1 – Send called party number.

Action 2 – Collect dynamic information for communication.

Action 3 – Stop collect dynamic information.

FIGURE 3-7/Q.736

Message flow for CASE C (No Transfer Mode)



Action 1 – Send Transfer Mode request.

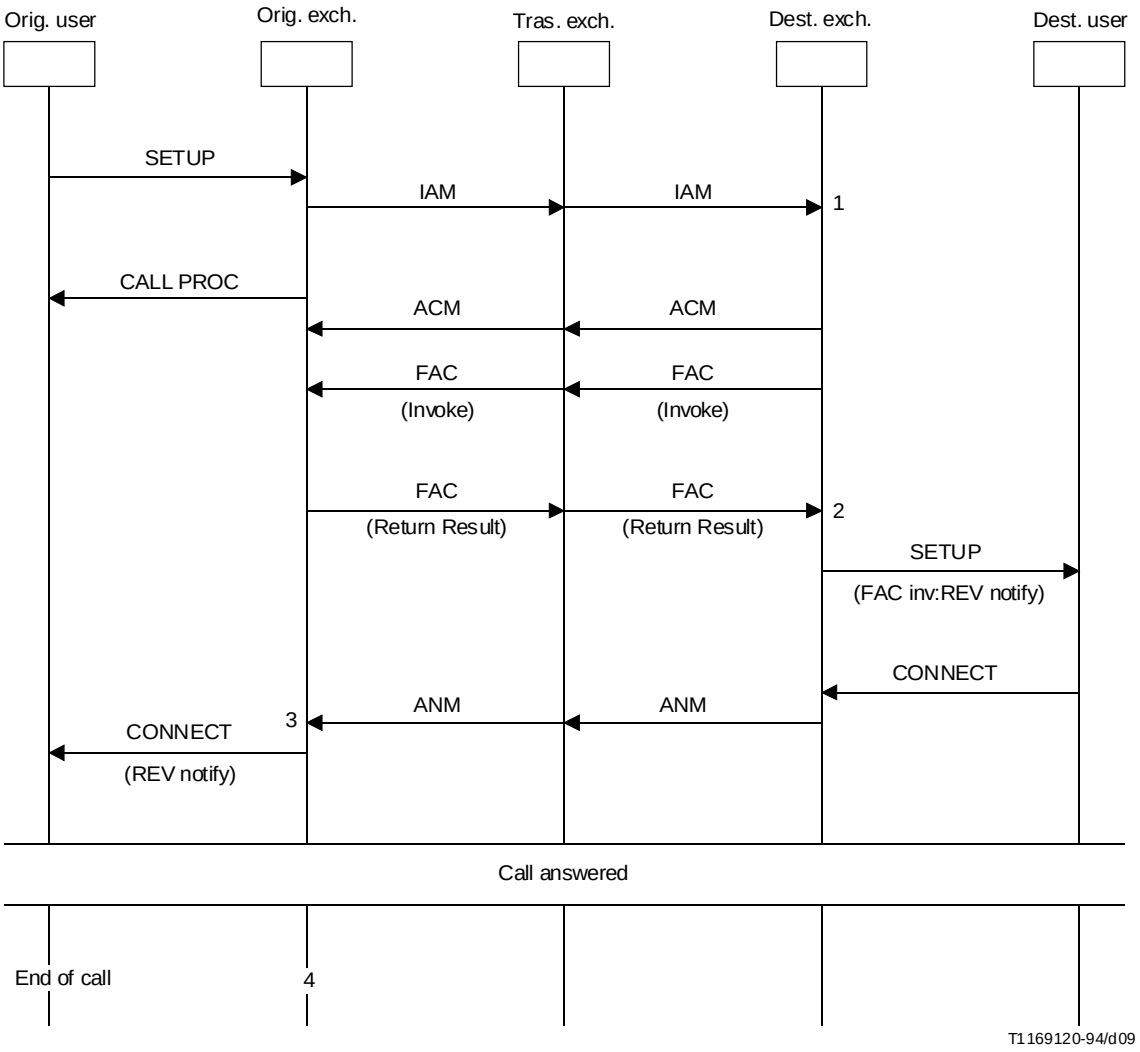
Action 2 – Send calling user number, Transfer Mode acceptance and duration time, and stop collect dynamic information for communication.

Action 3 – Collect dynamic information.

Action 4 – Stop collect dynamic information.

FIGURE 3-8/Q.736

Message flow for CASE C (Transfer Mode)



Action 1 – Perform a validation check for called user's subscription.

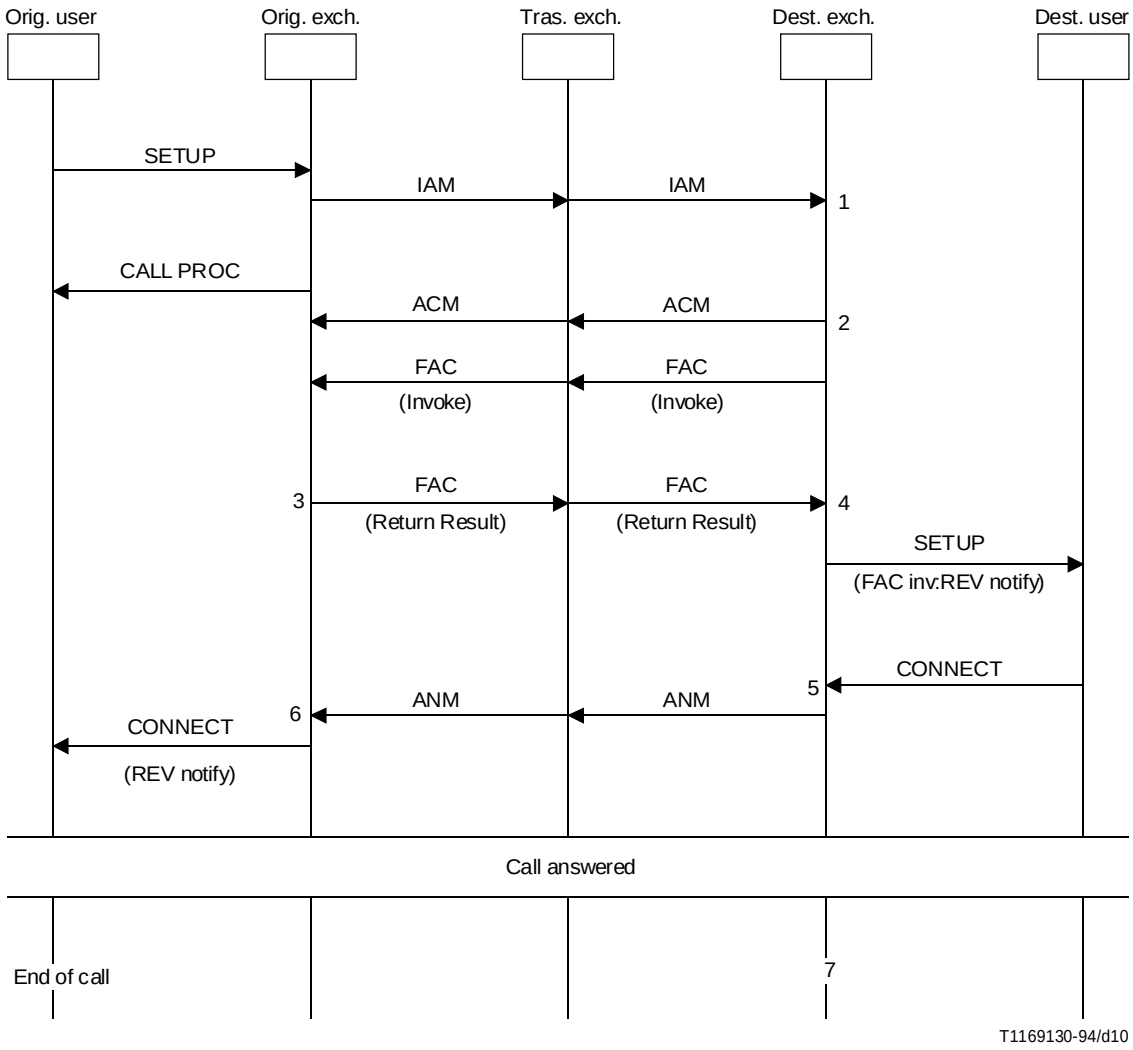
Action 2 – Send called party number.

Action 3 – Collect dynamic information for communication.

Action 4 – Stop collecting dynamic information.

FIGURE 3-9/Q.736

Message flow for CASE D (No Transfer Mode)



Action 1 – Perform a validation check for called user's subscription and requesting static information for charging.

Action 2 – Send Transfer Mode request.

Action 3 – Send calling party number and Transfer Mode acceptance.

Action 4 – Register static information for charging.

Action 5 – Collect dynamic information for communication.

Action 6 – Any operations concerning charging are not performed.

Action 7 – Stop collecting dynamic information.

FIGURE 3-10/Q.736

Message flow for CASE D (Transfer Mode)