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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.

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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.

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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.

Recommendation Q.736

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)*.



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- [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.



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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)}



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