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Digitalno omrežje z integriranimi storitvami (ISDN) - Dopolnilna storitev: obvestilo o ceni (AOC) - Protokol digitalne naročniške signalizacije št. 1 (DSS1) - 1. del: Specifikacija protokola

Integrated Services Digital Network (ISDN); Advice of Charge (AOC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 1 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Advice of Charge (AOC) supplementary service, as described below:

Part 1: "Protocol specification";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

In accordance with CCITT Recommendation I.130 [2], the following three level structure is used to describe the supplementary telecommunications services as provided by European public telecommunications operators under the pan-European Integrated Services Digital Network (ISDN):

- Stage 1: is an overall service description, from the user's standpoint;
- Stage 2: identifies the functional capabilities and information flows needed to support the service described in stage 1; and
- Stage 3: defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

The present document details the stage 3 aspects (signalling system protocols and switching functions) needed to support the Advice of Charge (AOC) supplementary service. The stage 1 and stage 2 aspects are detailed in ETS 300 178 [6] to ETS 300 180 [8] and ETS 300 181 [14], respectively.

National transposition dates	
Date of adoption of this EN:	10 September 1999
Date of latest announcement of this EN (doa):	31 December 1999
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 June 2000
Date of withdrawal of any conflicting National Standard (dow):	30 June 2000

1 Scope

This first part of EN 300 182 specifies the stage three of the Advice of Charge (AOC) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators at the T reference point or coincident S and T reference point (as defined in CCITT Recommendation I.411 [1]) by means of the Digital Subscriber Signalling System No. one (DSS1). Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see CCITT Recommendation I.130 [2]).

In addition, the present document specifies the protocol requirements at the T reference point where the service is provided to the user via a private ISDN.

The present document does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not an ISDN.

Three AOC supplementary services exist:

a) **Charging information at call set-up time (AOC-S)**

The AOC-S supplementary service enables a user to receive information about the charging rates at call set-up time and also to receive further information during the call if there is a change of charging rates.

b) **Charging information during the call (AOC-D)**

The AOC-D supplementary service enables a user to receive information on the recorded charges for a call during the active phase of the call.

c) **Charging information at the end of the call (AOC-E)**

The AOC-E supplementary service enables a user to receive information on the recorded charges for a call when the call is terminated.

The AOC supplementary service is applicable to all circuit-switched telecommunication services.

Further parts of the present document specify the method of testing required to identify conformance to the present document.

The present document is applicable to equipment, supporting the AOC supplementary service, to be attached at either side of a T reference point or coincident S and T reference point when used as an access to the public ISDN.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] CCITT Recommendation I.411 (1988): "ISDN user-network interfaces - Reference configurations".

[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.112: "Vocabulary of terms for ISDNs".

[4] ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".

[5] EN 300 403-1 (V1.3): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[6] ETS 300 178: "Integrated Services Digital Network (ISDN); Advice of Charge: charging information at call set-up time (AOC-S) supplementary service; Service description".

[7] ETS 300 179: "Integrated Services Digital Network (ISDN); Advice of Charge: charging information during the call (AOC-D) supplementary service; Service description".

[8] ETS 300 180: "Integrated Services Digital Network (ISDN); Advice of Charge: charging information at the end of the call (AOC-E); Service description".

[9] CCITT Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".

[10] CCITT Recommendation X.219 (1988): "Remote Operations: Model, notation and service definition".

[11] EN 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[12] EN 300 195-1: "Integrated Services Digital Network (ISDN); Supplementary service interactions; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[13] ITU-T Recommendation Z.100: "CCITT Specification and description language (SDL)".

[14] ETS 300 181: "Integrated Services Digital Network (ISDN); Advice of Charge (AOC) supplementary service; Functional capabilities and information flows".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

activation: implies either a user request for AOC supplementary service(s) or a network performed activation of the subscribed AOC supplementary service(s) whenever the served user makes an outgoing call.

NOTE 1: The stage 1 description, as specified in ETS 300 178 [6], ETS 300 179 [7] and ETS 300 180 [8], defines activation as being performed at the time of subscription.

basic communication: this charged item indicates the rate to be applied for the connection to the called user.

billing identification: elements for billing identification inform the served user that the associated charges have been incurred due to the indicated situation (e.g. a call that has been forwarded at the served user's access).

call attempt: this charged item indicates the cost applied for a call which has been sent to the called user, but the called user has not yet answered the call.

call control message: message as defined in EN 300 403-1 [5], subclause 3.1, which on sending or receipt causes a change of the call state at either the network or the user.

call setup: this charged item indicates the cost applied for the connection to the called user when the called user answers the call.

charging information: information sent to a user in an invoke component or a return result component showing charging-related information (i.e. either charging rate information, special charging rates, or the recorded charges for the call).

continuous: see subclause A.2.3.1 of ETS 300 178 [6].

flat rate: this specific rate indicates a fixed currency value per event.

Integrated Services Digital Network (ISDN): see CCITT Recommendation I.112 [3], § 2.3, definition 308.

invocation: implies the sending of charging information from the network to the served user.

NOTE 2: The stage 1 description, as specified in ETS 300 178 [6], ETS 300 179 [7] and ETS 300 180 [8], defines invocation as either a user request for an AOC supplementary service or as the network invocation for all calls.

invoke component: see EN 300 196-1 [11], subclause 8.2.2.1.

network: DSS1 protocol entity at the network side of the user-network interface.

operation of supplementary services: this charged item indicates the cost applied for the operation of requested supplementary services.

recorded charges: this information indicates the number of charging units or currency units incurred for a call.

return error component: see EN 300 196-1 [11], subclause 8.2.2.3.

return result component: see EN 300 196-1 [11], subclause 8.2.2.2.

served user: user of a particular ISDN number, who is requesting that charging information should be provided (for all calls or on request).

service: telecommunications service: see CCITT Recommendation I.112 [3], § 2.2, definition 201.

special charging arrangement: this charged item indicates that a special charging arrangement exists for calculating the cost of the call.

NOTE 3: The use of this charged item is outside the scope of the standard. It is a matter for the network operator and the user to which it is sent.

special charging code: this specific code indicates a rate which can identify a charging algorithm that can be used as a basis for determining the cost of a call.

step function: see subclause A.2.3.1 of ETS 300 178 [6].

supplementary service: see CCITT Recommendation I.210 [4], § 2.4.

user: DSS1 protocol entity at the user side of the user-network interface.

user-to-user information transfer: this charged item indicates the rate to be applied to the transfer of user-to-user information.

3.2 Abbreviations

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

AOC	Advice of Charge
AOC-D	AOC During the call
AOC-E	AOC at the End of the call
AOC-S	AOC at call Set-up time
ASN.1	Abstract Syntax Notation One
ATS	Abstract Test Suite
DSS1	Digital Subscriber Signalling System No. one
ISDN	Integrated Services Digital Network
PICS	Protocol Implementation Conformance Statement
TSS&TP	Test Suite Structure and Test Purposes

4 Description

4.1 General description

Depending on subscription by the served user, charging information for any of the three supplementary services may be provided either:

- for all calls; or
- for any call, after a user request to provide charging information.

The charging information given shall relate to the charges incurred on the network to which the user is attached.

Charging information for applications using higher layer protocols which are not defined as teleservices, shall be based on the bearer services specified.

4.2 Charging information at call set-up time (AOC-S)

When the AOC-S supplementary service is activated, the network shall provide the user with information about the charging rates at call establishment. In addition, the network shall inform the served user if a change in charging rates takes place during the call.

The network shall provide the charging information during call establishment or at the latest at call connection. When there is a change in the charging rate during the call, the network shall send information about the new charging rate to the served user.

4.3 Charging information during the call (AOC-D)

When the AOC-D supplementary service is activated, the network shall provide the user with charging information for a call during the active phase of a call. The network shall provide the charging information and transfer it to the served user in an appropriate message. The supplied charging information shall be provided as a cumulative charge incurred so far for the call (i.e. charges recorded from the start of the call and until the moment the charging information is sent to the served user).

When the call is released, the network shall send the recorded charges for the call to the served user in one of the call control messages clearing the call.

If the network has determined that the call is free of charge, then the network shall send a free-of-charge indication in the first subsequent message sent to the served user. The network shall not send any further charging information during the call. When the call is released, the network shall send the charged amount (zero) in a call control message clearing the call.

4.4 Charging information at the end of the call (AOC-E)

When the AOC-E supplementary service is activated, the network shall provide the served user with charging information indicating the recorded charges for a call when the call is released. The network shall send the charging information to the served user in one of the call control messages clearing the call.

5 Operational requirements

5.1 Provision and withdrawal

These supplementary services shall be provided separately by arrangement with the service provider or be generally available. Withdrawal of the service shall be made at subscriber request or for administrative reasons.

The following subscription options exist for each of the three AOC supplementary services, as defined in table 1.

Table 1: Advice of charge subscription options

Subscription options	Value
Provision of service	1. For all calls; or
	2. On request on a per call basis.

5.2 Requirements on the originating network side

For the purpose of the present document, the served user of the AOC supplementary service is connected to the originating network.

The originating network shall make available the type of charging information that is indicated, related to a certain call.

The originating network shall assemble the appropriate charging information, according to the service requirements, and send it to the user.

NOTE: The charging information may either be generated at the originating network, or generated elsewhere and sent to the originating network, in due time for the information to be provided to the user according to the procedures of the present document.

The network shall only include a charged item if the charged item contains information concerning the charges applied to that call.

The network shall only use those charged items which are appropriate to that network charging mechanism. Thus, in some networks, the network may, but need not, send some of these items, or combinations of items. Different networks could give information about the same call in different ways.

If the served user suspends a call, then, as a network option, the originating network shall retain the charging information for the suspended call as long as the network retains the call identity of the suspended call of the served user.

5.3 Requirements on the destination network side

None identified.

6 Coding requirements

6.1 General

The charging information that the network shall convey to the served user may consist of a number of information units. The information to be transferred is specified in clause 5 of the stage 1 service descriptions ETS 300 178 [6], ETS 300 179 [7], and ETS 300 180 [8].

6.2 Coding of the Facility information element components

Table 2 shows the definition of the operations and errors required for the AOC supplementary service using Abstract Syntax Notation one (ASN.1) as defined in CCITT Recommendation X.208 [9] and using the OPERATION and ERROR macro as defined in CCITT Recommendation X.219 [10], figure 4/X.219.

The formal definition of the component types to encode these operations and errors is provided in EN 300 196-1 [11], annex D, clause D.1.

The inclusion of components in Facility information elements is defined in EN 300 196-1 [11], subclause 11.1.