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**Integrated Services Digital Network (ISDN);
Advice Of Charge: charging information
at the end of the call (AOC-E) supplementary service
Service description**

ETSI

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI).

In accordance with CCITT Recommendation I.130 [1], 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.

This ETS details the stage 1 aspects (overall service description) for the Advice Of Charge: charging information at the end of a call (AOC-E) supplementary service. Stage 2 and stage 3 aspects are detailed in ETS 300 181 (1992) and 300 182 (1992) respectively.

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1 Scope

This standard defines the stage one of the Advice Of Charge: charging information at the end of the call (AOC-E) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators. Stage one is an overall service description from the user's point of view (see CCITT Recommendation I.130 [1]), but does not deal with the details of the human interface itself.

This standard defines the interworking requirements of private ISDNs with the public ISDN.

In addition, this standard specifies the base functionality where the service is provided to the user via a private ISDN.

This standard does not specify the additional requirements where the service is provided to the user via a telecommunications network that is not an ISDN but does include interworking requirements of other networks with the public ISDN.

Charging principles are outside the scope of this standard.

Interaction with supplementary services not listed in Clause 8 are outside the scope of this standard.

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-E supplementary service is applicable to all circuit-switched telecommunications services.

This standard is applicable to the stage two and stage three standards for the ISDN AOC-E supplementary service. The terms "stage two" and "stage three" are also defined in CCITT Recommendation I.130 [1]. Where the text indicates the status of a requirement (i.e. as strict command or prohibition, as authorisation leaving freedom, or as a capability or possibility), this shall be reflected in the text of the relevant stage two and stage three standards.

Furthermore, conformance to this standard is met by conforming to the stage three standard with the field of application appropriate to the equipment being implemented. Therefore, no method of testing is provided for this standard.

2 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of, any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] CCITT Recommendation I.130 (1988): "Method for the characterisation of the telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [2] CCITT Recommendation I.112 (1988): "Vocabulary of terms for ISDNs".
- [3] CCITT Recommendation I.210 (1988): "Principles of telecommunication services supported by an ISDN and the means to describe them".
- [4] CCITT Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".

3 Definitions

For the purpose of this standard, the following definitions apply:

Integrated Services Digital Network (ISDN): see CCITT Recommendation I.112 [2], § 2.3 definition 308.

Service; telecommunications service: see CCITT Recommendation I.112 [2], § 2.2 definition 201.

Supplementary service: see CCITT Recommendation I.210 [3], § 2.4.

Served user: The user to whom the AOC-E supplementary service is provided.

Basic access: see CCITT Recommendation Q.9 [4], § 1 definition 1551.

Primary rate access: see CCITT Recommendation Q.9 [4], § 1 definition 1552.

4 Symbols and abbreviations

AOC-E Advice of Charge: charging information at the end of the call

ISDN Integrated Services Digital Network

5 Description

The AOC-E supplementary service shall apply to the basic access and to the primary rate access.

The AOC-E supplementary service provides the served user with charging information for a call when the call is terminated. The information can be sent for all calls, or on a per call basis. The charge information given shall relate to the charges incurred on the network to which the served user is attached.

The structure, contents and application of the charging information is given in Annex A.

6 Procedures

6.1 Provision and withdrawal

The AOC-E supplementary service shall either be provided on a subscription basis or be generally available. The AOC-E supplementary service can be offered with one subscription option. Only one value can be selected.

Table 1

Subscription option	Values
Invocation	- For all calls automatically - On a per call basis (NOTE)
NOTE: If the AOC-E supplementary service is generally available, then the value "on a per-call basis" should be the default value.	

Withdrawal shall be at request of the subscriber or for service provider reasons.

6.2 Normal procedures

6.2.1 Activation, deactivation and registration

The AOC-E supplementary service shall be activated on provision and deactivated on withdrawal.

The AOC-E supplementary service requires no registration.

6.2.2 Erasure

Not applicable.

6.2.3 Invocation and operation

Depending on the value of the subscription option, the AOC-E supplementary service shall be invoked on all calls, or it can be invoked by the served user on a per call basis.

If the AOC-E supplementary service is provided on a per call basis, the user shall request the AOC-E supplementary service when originating a call in order to invoke the AOC-E supplementary service.

The charging information shall be provided by the network when the call is terminated. If the call is free of charge, this shall be indicated (either by the value "0", or by "free of charge").

The structure, contents and application of the charging information is given in Annex A.

6.2.4 Interrogation

Not applicable.

6.3 Exceptional procedures

6.3.1 Activation, deactivation and registration

Not applicable.

6.3.2 Erasure

Not applicable.

6.3.3 Invocation and operation

If a served user who is not provided with the AOC-E supplementary service attempts to invoke the AOC-E supplementary service, then the attempt to invoke the AOC-E supplementary service shall be rejected by the network and the user shall be informed of the reason.

If the charging information related to a call is not available, this shall be indicated to the served user using the recorded charges "not available".

If the network recognises that the information for a particular recorded charge is incomplete, then the recorded charge "not available" shall be included.

If for any reason, no charging information is provided at all on a call, then the user shall assume that the information is not available. The user cannot assume that the call is free of charge.

6.3.4 Interrogation

Not applicable.

7 Intercommunication considerations

7.1 Interworking with non-ISDNs

There is no impact on the operation of the AOC-E supplementary service.

7.2 Interworking with private ISDNs

The AOC-E supplementary service shall be supported across the inter-network interface between ISDNs (i.e. public or private).

8 Interaction with other supplementary services

8.1 Advice of charge

8.1.1 Charging information at call set-up time

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.1.2 Charging information during the call

If both the advice of call: charging information during the call supplementary service and the AOC-E supplementary service have been invoked, when the call is terminated, only the information related to the AOC-E supplementary service shall be given.

8.1.3 Charging information at the end of the call

Not applicable.

8.2 Call waiting

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.3 Call hold

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.4 Explicit call transfer

After a call has been transferred and the transferring user is charged for the transferred part of the call, and the AOC-E supplementary service has been invoked for that call, then as a network option, the charging information can be sent to the transferring user when the call is terminated.

8.5 Number identification services

8.5.1 Calling line identification presentation

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.5.2 Calling line identification restriction

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.5.3 Connected line identification presentation

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.5.4 Connected line identification restriction

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.6 Closed user group

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.7 Completion of calls to busy subscriber

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.8 Conference services

8.8.1 Conference call, add-on

8.8.1.1 Conference controller

NOTE 1: Some networks may not support the AOC-E supplementary service in conjunction with the conference call, add-on supplementary service, or may only give part of the information, e.g. due to off-line processing of the charges associated to the conference call, add-on supplementary service. In the former case an indication that the AOC-E supplementary service is not available should be given on invocation of the conference call, add-on supplementary service if the AOC-E supplementary service has been invoked.

Invocation of the conference call, add-on supplementary service from the idle state:

If the AOC-E supplementary service is automatically invoked on all calls, or if the conference controller invokes the AOC-E supplementary service at the same time as the conference call, add-on supplementary service is invoked, then charging information shall be given for the whole conference when the conference is terminated.

Invocation of the conference call, add-on supplementary service from an active call:

If the AOC-E supplementary service has been invoked for the initial call, then it shall be invoked automatically for the conference.

If the AOC-E supplementary service has not been invoked for the initial call, then the conference controller can invoke the AOC-E supplementary service at the same time as the conference call, add-on supplementary service is invoked.

Addition of a call to a conference:

For calls between the conference controller and potential conferees which are outside the conference, the normal procedures for the AOC-E supplementary service shall apply. When a call for which the AOC-E supplementary service has been invoked, is added to the conference, then charging information shall be given as if the call was terminated at the moment it is added to the conference.

NOTE 2: Further charges resulting from the communication with the new conferee are considered to be part of the charging for the conference.

Creating a private communication with one of the parties:

In this case the private communication shall be considered as a new call between the conference controller and the individual party. If the AOC-E supplementary service has been invoked for the conference, it shall be invoked automatically for the new call when the private communication is established.

Terminating the conference:

When the conference is terminated and the AOC-E supplementary service has been invoked for the conference, then the overall charges for the conference shall be sent to the conference controller. If the conference call, add-on supplementary service was invoked from an active call and the AOC-E supplementary service has been invoked for that call, then the charging information shall include charges for the initial call.

Other operation on the conference:

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.8.1.2 Conferees

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.8.2 Meet-me conference

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.9 Direct dialling in

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.10 Diversion services

8.10.1 Call forwarding unconditional

Original calling user:

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

Forwarding user:

When a call is forwarded and the forwarding user is charged for the forwarded part of the call, then as a network option, the charging information can be transferred to the forwarding user when the call is terminated provided that the served user has subscribed to the AOC-E supplementary service with the value of the subscription option set to "for all calls automatically".

8.10.2 Call forwarding busy

Original calling user:

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

Forwarding user:

When a call is forwarded and the forwarding user is charged for the forwarded part of the call, then as a network option, the charging information can be transferred to the forwarding user when the call is terminated provided that the served user has subscribed to the AOC-E supplementary service with the value of the subscription option set to "for all calls automatically".

8.10.3 Call forwarding no reply

Original calling user:

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

Forwarding user:

When a call is forwarded and the forwarding user is charged for the forwarded part of the call, then as a network option, the charging information can be transferred to the forwarding user when the call is terminated provided that the served user has subscribed to the AOC-E supplementary service with the value of the subscription option set to "for all calls automatically".

8.10.4 Call deflection

Original calling user:

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

Deflecting user:

When a call is deflected and the deflecting user is charged for the deflected part of the call, then as a network option, the charging information can be transferred to the deflecting user when the call is terminated, provided that the served user has subscribed to the AOC-E supplementary service with the value of the subscription option set to "for all calls automatically".

8.11 Freephone

Calling user:

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

Called user:

Information for the AOC-E supplementary service shall not be sent to the called freephone user.

8.12 Malicious call identification

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.13 Multiple subscriber number

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.14 Subaddressing

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

8.15 Terminal portability

If the call is terminated while the call is suspended at the calling user's access, and if the calling user attempts to resume the call within the timer, then, as a network option, advice of charge information can be given to that user at the time of the resume attempt.

8.16 Three party

Charges for the different connections to the three party supplementary service:

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

Charges for the use of the three party supplementary service:

As a network option, the charging information can be sent to the served user.

8.17 User-to-user signalling

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

Annex A (normative): Structure, contents and application of charging information

A.1 Introduction

This annex gives the structure and contents of the charging elements supplied by the network. In addition, it indicates what information is supplied with the different charged items.

A.2 Structure and contents of charging information

A.2.1 Type of charging information

The following type of charging information shall be supplied:

- **total charges**

this type of charging information is sent to the served user when the call is terminated, and indicates the total charges recorded for the call.

NOTE: Some networks may not include some charges, e.g. charges incurred by the use of some supplementary services.

A.2.2 Recorded charges

The following types of recorded charges can be included:

- **recorded number of charging units**

this information indicates the number of charging units incurred for the call;

- the following sub-unit shall be included:
 - number of charging units (integer value).
- The following sub-unit can be included:
 - type of charging unit.

NOTE: If different types of charging units apply, the recorded number of charging units for each type of charging unit may be given.

The type of charging unit shall be indicated as an integer value from 1 to 16. Each service provider shall specify their use and significance of these values (e.g. the values may correspond to different currency amounts);

- **recorded number of currency units**

this information indicates the number of currency units incurred for the call. The following sub-units shall be included:

- currency identifier;
- currency amount (integer value and a multiplier).

The multiplier shall have one of the following values: 0,001; 0,01; 0,1; 1; 10; 100; or 1000;

- **free of charge**

this information indicates that there is no charge to the served user for this call;

- **not available**

this information indicates that some or all of the recorded charges are not available. The network shall not give a reason.

A.2.3 Billing identification

Only one of the following types of billing identification shall be included:

- **normal charging**

this billing identification indicates that charges are incurred due to normal charging, i.e. the calling user is charged.

- **reverse charging**

this billing identification indicates that charges are incurred due to reverse charging;

- **credit card charging**

this billing identification indicates that charges are paid by means of a credit card;

- **call forwarding unconditional**

this billing identification indicates that charges are incurred due to the invocation of the call forwarding unconditional supplementary service;

- **call forwarding busy**

this billing identification indicates that charges are incurred due to the invocation of the call forwarding busy supplementary service;

- **call forwarding no reply**

this billing identification indicates that charges are incurred due to the invocation of the call forwarding no reply supplementary service;

- **call deflection**

this billing identification indicates that charges are incurred due to the invocation of the call deflection supplementary service;

- **call transfer**

this billing identification indicates that charges are incurred due to the invocation of the call transfer supplementary service.

A.3 Application of charging information

Charging information shall be given either in currency units or in charging units. The use of these is a network option. The recorded charges that give the charging applied for the call shall be covered. The information can be accompanied by a billing identification. If the billing identification is not included, the default value shall be interpreted as "normal charging".

The type of charging information "total charges" indicates the recorded charges for the call. The information shall only be given to a served user when the call is terminated. The final value of the charge given by the type of recorded charges associated with the call shall be included.

History

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