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Integrated Services Digital Network (ISDN); Explicit Call Transfer (ECT) supplementary service; Service description



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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Network Aspects (NA).

In accordance with CCITT Recommendation I.130, 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 is the second version of the stage 1 aspects (overall service description) for the Explicit Call Transfer (ECT) supplementary service. The stage 2 aspects are detailed in ETS 300 368 (1995) and the stage 3 aspects are detailed in EN 300 369-1 and EN 300 356-14. Whilst there are some editorial changes, the present document contains functionality that is additional to that defined in the previous edition of the present document. The additional functionality relates to a service provider option removing the requirement that one of the calls to be transferred is on hold.

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1 Scope

The present document defines the stage one of the Explicit Call Transfer (ECT) 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.

The present document defines the interworking requirements of private ISDNs with the public ISDN.

In addition the present document specifies the base functionality where the service is provided to the user via a private ISDN.

The present document 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.

Interactions with supplementary services not listed in clause 8 are outside the scope of the present document.

Charging principles are outside the scope of the present document.

The ECT supplementary service enables a user who has two calls, each of which can be an incoming call or an outgoing call, to connect together the other users in the two calls, into one call.

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

The present document is applicable to the stage two and stage three standards for the ISDN ECT 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 authorization leaving freedom, as a capability or possibility), this shall be reflected in the text of the relevant stage two and stage three standards.

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

2 Normatives references

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case 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.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [2] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".
- [3] ITU-T Recommendation E.164 (1997): "The international public telecommunication numbering plan".
- [4] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".

- [5] ETS 300 345: "Integrated Services Digital Network (ISDN); Interworking between public ISDNs and private ISDNs for the provision of telecommunication services; General aspects".

3 Definitions and abbreviations

3.1 Definitions

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

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [2], subclause 2.3, definition 308.

service; telecommunication service: See ITU-T Recommendation I.112 [2], subclause 2.2, definition 201.

supplementary service: See ITU-T Recommendation I.210 [4], subclause 2.4.

ISDN number: A number conforming to the numbering plan and structure specified in ITU-T Recommendation E.164 [3].

user A: The user to whom the ECT supplementary service is provided.

user B: The other user in one of user A's calls. By convention, in the present document, it is considered that the connection has been established on this call.

user C: The other user in another of user A's calls.

network operator: The entity which provides the network operating elements and resources for the execution of the ECT supplementary service.

service provider: The entity which offers subscription to the ECT supplementary service. The network operator may be the service provider.

basic access: See ITU-T Recommendation I.112 [2], subclause 2.4, definition 425.

primary rate access: See ITU-T Recommendation I.112 [2], subclause 2.4, definition 426.

subaddress: See ITU-T Recommendation E.164 [3], subclause 12.2.

held call: A call on which the call hold supplementary service is currently in operation.

active call: A call on which the call hold supplementary service is not currently in operation.

NOTE: In other contexts, an active call is a call on which the connection has already been established. This is not the usage of this term for the present document.

3.2 Abbreviations

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

ECT	Explicit Call Transfer
ISDN	Integrated Services Digital Network

4 Description

The ECT supplementary service enables a user (user A) to transform two of that user's calls, each of which can be an incoming call or an outgoing call, into a new call between user B and user C.

Prior to transfer, the connection shall have been established on the call between user A and user B. On the call between user A and user C, either the connection shall have been established prior to transfer, or, as a service provider option, transfer can occur while user C is being informed of the call (i.e. the connection has not yet been established).

NOTE: Service providers may reject a request for the ECT supplementary service depending on criteria outside the scope of the present document (e.g. for operational reasons under certain circumstances). The associated procedures are outside the scope of the present document.

The ECT supplementary service can be available to users who are connected to the network via a basic access or a primary rate access.

5 Procedures

5.1 Provision and withdrawal

The ECT supplementary service shall be provided to the user after prior arrangement with the service provider.

The ECT supplementary service shall be withdrawn by the service provider upon request of the subscriber or for service provider reasons.

5.2 Normal procedures

5.2.1 Activation, deactivation and registration

Not applicable.

5.2.2 Erasure

Not applicable.

5.2.3 Invocation and operation

User A, who has two calls (one with user B and one with user C), each of which can be an incoming call or an outgoing call, can request the invocation of the ECT supplementary service with respect to the two calls.

NOTE 1: It is the responsibility of user A to ensure that the two calls are compatible.

The connection shall have been established on one of the calls (referred to as the call between user A and user B). The service provider shall support the transfer of calls where one of the calls between user A and user B and between user A and user C shall be an active call, the other shall be a held call. As a service provider option, the ECT supplementary service may be invoked in cases where both calls (between user A and user B and between user A and user C) are active calls.

The ECT supplementary service can be invoked after the connection has been established on the call between user A and user C. (see table 1).

Table 1: Basic conditions for invocation of the ECT supplementary service

call between user A and user B	call between user A and user C
Connection established; held call	connection established; active call
Connection established; active call	connection established; held call
Service provider option: connection established; active call	connection established; active call

As a service provider option, the ECT supplementary service can be invoked after user C has been informed of the call (i.e. an outgoing call from user A to user C, where the connection has not yet been established). (See table 2).

Table 2: Further conditions for invocation of the ECT supplementary service if the service provider allows transfer when user C has been informed of the call (but before connection establishment)

call between user A and user B	call between user A and user C
connection established; held call	user C being informed; active call
connection established; active call	user C being informed; held call
Service provider option in table 1 supported: connection established; active call	user C being informed; active call

On successful invocation of the ECT supplementary service, the two calls between user A and user B and between user A and user C, shall be removed from user A's access and shall be transformed into a call between user B and user C.

If the service provider option allowing transfer when user C has been informed of the call (but before connection establishment) is supported, then if user C is being informed of the call from user A at the time of transfer, the call shall remain in this state at user C, and when the connection is established by user C, user C shall be connected to user B.

The service provider shall inform user B and user C of the transfer and shall indicate the state (connection established, or user being informed of the call) of the call to the other user. If the service provider option allowing transfer when user C has been informed of the call (but before connection establishment) is supported, then after the connection is established on a call which was transferred whilst user C was being informed of that call, user B shall be informed that the connection has been established on the call to user C.

Subject to any restrictions (see subclauses 7.5.2 and 7.5.4), the ISDN number of user B shall be indicated to user C.

Subject to any restrictions (see subclauses 7.5.2 and 7.5.4), the ISDN number of user C shall be indicated to user B, either:

- at the time of transfer, if the connection had been established on the call between user A and user C; or
- when user B is informed that the connection has been established on the call to user C, if this occurs after transfer.

After receiving the indication that the transfer has occurred, user B can provide a subaddress. If this information is supplied by user B, the network shall deliver it to user C independently of any restrictions (see subclauses 7.5.2 and 7.5.4).

If the connection had been established on the original call between user A and user C, user C can also provide a subaddress after receiving the indication that the transfer has occurred. If this information is supplied by the user C, the network shall deliver it to user B independently of any restrictions (see subclauses 7.5.2 and 7.5.4).

If the connection is established on the call to user C after transfer has occurred and user C provides a subaddress, then user B shall be given the subaddress of user C, subject to any restrictions (see subclause 7.5.4), when user B is informed that the connection has been established.

NOTE 2: Users wishing to have their subaddress given to the other user will need to register their subaddress with their terminal in advance.

5.2.4 Interrogation

Not applicable.

5.3 Exceptional procedures

5.3.1 Activation, deactivation and registration

Not applicable.

5.3.2 Erasure

Not applicable.

5.3.3 Invocation and operation

The request for the invocation of the ECT supplementary service shall be rejected if the user has not subscribed to the ECT supplementary service.

Also, the request for the invocation of the ECT supplementary service shall be rejected if the network is unsuccessful in connecting user B and user C (e.g. if the connection has not been established on either of the calls).

The user who requested the invocation of the ECT supplementary service shall be informed of the reason for rejection and the calls involved shall remain in the state they were in before the request for the invocation of the ECT supplementary service was received.

The request for the ECT supplementary service shall be rejected if, as a network option, the network can determine that the resulting connection would contain no user who is able to terminate the call.

NOTE: It may not be possible to decide if the resulting connection would have such a user, e.g. when interworking between different versions of signalling systems occurs. In such cases, as a network option, the request for the ECT supplementary service may be accepted, or rejected. If the request for the ECT supplementary service is accepted in this case, the network may employ other means to control this situation (e.g. time supervision). The procedures for this are outside the scope of the present document.

If the ISDN number of user B or user C cannot be given to the other user (e.g. due to number presentation restriction or number not available) when the indication that the transfer has occurred is given to the user, then the user who would have been given the ISDN number, shall receive an indication of why no ISDN number is given.

5.3.4 Interrogation

Not applicable.

6 Intercommunication considerations

NOTE 1: In the case of the ECT supplementary service invoked on calls to users belonging to different networks (e.g. in different countries or continents), a decrease in quality of service parameters for the connection between those users may arise, e.g. long transmission delay, or unacceptable attenuation of audio signals. A network may provide some precautions, e.g. limit the number of international border crossings, limit the number of satellite hops, and, therefore, the invocation of the ECT supplementary service may be rejected in some cases.

NOTE 2: If interworking between networks occurs, it may not be possible to decide if the resulting connection does not contain a user who is able to terminate the call. In such cases, as a network option, the request for the ECT supplementary service may be accepted, or rejected. If the request for the ECT supplementary service is accepted in this case, the network may employ other means to control this situation (e.g. time supervision). The procedures for this are outside the scope of the present document.

6.1 Interworking with non-ISDNs

If a transferred user is not within the ISDN, it may not be possible to inform that user of the transfer. Also, the address of a transferred user that is not within the ISDN may be unavailable (e.g. no information, or due to restrictions agreed between the network operators).

6.2 Interworking with private ISDNs

Interworking with private ISDNs shall include the general requirements given in ETS 300 345 [5].

When a remote user (i.e. user B or user C) is on a network different from that of user A (e.g. one user on a private ISDN and the other user on a public ISDN), indications to the remote user shall be sent to the remote user's network for forwarding to the remote user. Numbers included in these indications shall be provided in the form of national numbers, national (significant) numbers or international ISDN numbers (see ITU-T Recommendation E.164 [3]).

NOTE: If interworking between public ISDNs and private ISDNs occurs, the co-operation of the networks involved is required in order to determine that the resulting connection would contain no user able to terminate the call. Depending on implementation, this co-operation will not necessarily be available.

If the served user (user A) is located in the private ISDN, and if both calls between user A and user B and between user A and user C are interconnected with the public ISDN at the same public node (either on separate accesses or the same access) then, as a service provider option, the ECT supplementary service may be invoked in the public ISDN at the request of the private ISDN.

The connection shall have been established on one of the calls (referred to as the call between user A and user B.)

The operation of the ECT supplementary service shall be in accordance with subclause 5.2.3 for the case where both calls (between user A and user B and between user A and user C) are active calls.

On successful invocation of the ECT supplementary service, the two calls between user A and user B and between user A and user C, shall be removed from the access(es) between the public ISDN and the private ISDN and shall be transformed into a call between user B and user C.

7 Interaction with other supplementary services

Interactions with any supplementary services not listed below can be found in the standards containing the service descriptions for those supplementary services.

7.1 Advice of charge services

7.1.1 Advice of charge at call set-up

When user A transfers a call and has activated the advice of charge: charging information at call set-up time supplementary service, then the advice of charge: charging information at call set-up time supplementary service shall be considered as completed.

For user B and user C, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.1.2 Advice of charge during the call

When user A transfers a call and has activated the advice of charge: charging information during the call supplementary service, the charge up to that time shall be sent as a subtotal charge for that call. The advice of charge: charging information during the call supplementary service shall then be considered as completed.

NOTE: If user A had activated the advice of charge: charging information during the call supplementary service, then user A will receive information separately for both of the calls.

For user B and user C, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.1.3 Advice of charge at the end of a call

If user A is charged for the transferred part of the call and has activated the advice of charge: charging information at the end of the call supplementary service for that call, then either:

- a) the charging information shall be sent to user A when the transferred call is terminated; or
- b) when the calls are transferred user A shall be informed that charging information is not available. The advice of charge: charging information at the end of the call supplementary service shall then be considered as completed.

For user B and user C, no impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7.2 Call waiting

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

7.3 Call hold

The invocation of the ECT supplementary service shall have no impact on any held calls not involved in the transfer.

If either of the transferred users (user B or user C) have put their call to user A on hold prior to the transfer, the resulting transferred call shall remain on hold by that user. User A shall be replaced as the held user in the call by the other user (user C or user B).

7.4 Explicit call transfer

The ECT supplementary service can be invoked simultaneously by the users on a call for which the connection has been established, but this is not regarded as a normal situation. The network shall not explicitly prevent this occurring, but likewise cannot guarantee that the indications supplied to the users involved will be sensible to those users. There can be more than one indication generated due to multiple invocations of the ECT supplementary service and the arrival of such indications is dependent on the timing of their invocation by the users involved in the call. The network shall transfer these indications when they are generated.

Therefore, both users (user A and user B) in a normal call, who have each subscribed to the ECT supplementary service, can simultaneously transfer the call. That is, if user A and user B are involved in a call on which the connection has been established, user A can transfer the call to user C and user B can transfer the call to another user. Call progress signals and other indications shall be delivered to the appropriate party.

NOTE: Mechanisms which prevent the ECT supplementary service from resulting in a connection which contains no users able to terminate the call may result in rejection of simultaneous requests to invoke the ECT supplementary service by the users involved in the call.

7.5 Number identification services

7.5.1 Calling line identification presentation

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

7.5.2 Calling line identification restriction

A calling user's restriction requirements from the original call shall be used in order to restrict the presentation of that user's ISDN number to the other user in a transferred call.

7.5.3 Connected line identification presentation

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

7.5.4 Connected line identification restriction

A connected user's restriction requirements from the original call shall be used in order to restrict the presentation of that user's ISDN number to the other user in a transferred call.

If the connection is established on the call to user C after transfer, the presentation of the ISDN number and the subaddress of user C shall be restricted according to user C's connected line identification restriction supplementary service (i.e. as for the normal operation of the connected line identification restriction supplementary service).

7.6 Closed user group

The two calls shall use the same closed user group for the transfer to be successful.

NOTE: Closed user group restrictions between users will have been checked when the first call is established. Similarly, closed user group restrictions between users will have been checked when establishing the second call.

7.7 Completion of calls to busy subscriber

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

7.8 Conference services

7.8.1 Conference call, add-on

The conference controller cannot transfer the conference to another user.

Conferees can invoke the ECT supplementary service in order to transfer their connection to the conference to another user after that connection has been established.

7.8.2 Meet-me conference

Any participant in a meet-me conference can invoke the ECT supplementary service in order to transfer their connection to the conference to another user, after that connection has been established.

NOTE: A service provider may take appropriate measures to prevent a connection to a conference from being transferred. The associated procedures are outside the scope of the present document.

7.9 Direct dialling in

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

7.10 Diversion services

7.10.1 Call forwarding unconditional

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

7.10.2 Call forwarding busy

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

7.10.3 Call forwarding no reply

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

NOTE: Where a service provider supports the option to transfer a call for which the connection has been established to a user to which the connection has not yet been established, the transferred call can be forwarded if this second user has activated the call forwarding no reply supplementary service.

7.10.4 Call deflection

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

NOTE: Where a service provider supports the option to transfer a call for which the connection has been established, to a user to which the connection has not yet been established, the transferred call can be deflected if this second user invokes the call deflection supplementary service.

7.11 Freephone

If a freephone call is delivered to user A, i.e. user A is an answering point for the freephone supplementary service, and the freephone call is transferred due to the ECT supplementary service in operation at user A's access arrangement, the user who called the freephone number shall neither receive information that the call has been transferred, nor receive the transferred-to number.

NOTE: If user A originates a freephone call and transfers it to another user then, on transfer, the freephone number will be used in any indications to the other user.

7.12 Malicious call identification

The transferring user (user A) cannot invoke the malicious call identification supplementary service on a call after transfer of that call has been successfully invoked.

If after transfer has been completed, a transferred-to user (user B or user C) successfully invokes the malicious call identification supplementary service, then the network shall register the identity of both transferred-to users (user B and user C) and the identity of the transferring user (user A).

7.13 Multiple subscriber number

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

7.14 Subaddressing

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

7.15 Terminal portability

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

7.16 Three party

A user who has invoked the three party supplementary service cannot invoke the ECT supplementary service in order to transfer either of the calls involved. That user shall terminate the three party supplementary service in order to transfer either of the calls involved in the three-way conversation.

NOTE: Users should use the "private communication" function to terminate the three-party supplementary service and to retain the two calls prior to requesting the ECT supplementary service.

7.17 User-to-user signalling

When calls are transferred as a result of invocation of the ECT supplementary service, the user-to-user signalling supplementary service activated on either of the calls prior to the invocation of the ECT supplementary service shall be cancelled by the network.

No specific indications shall be sent to the users on the resulting call when the user-to-user signalling supplementary service is no longer activated.

The users on the resulting call can request user-to-user signalling supplementary service, service 3 again, if required.

History

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