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SERIES I: INTEGRATED SERVICES DIGITAL
NETWORK

Service capabilities – Supplementary services in ISDN

**Call offering supplementary services:
Explicit call transfer**

ITU-T Recommendation I.252.7

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION I.252.7

CALL OFFERING SUPPLEMENTARY SERVICES: EXPLICIT CALL TRANSFER

Summary

Two methods of call transfer are identified. The explicit call transfer supplementary service is described in this Recommendation. The other is described in Recommendation I.252.1. The explicit call transfer supplementary service enables a user to transform two of that user's calls, each of which can be an incoming or an outgoing call, into a new call between the other parties in the two calls. Prior to transfer, one of the two calls shall be answered, the other call can be either alerting or answered, depending on a network option. Calls incoming to the served user must have been answered.

Source

ITU-T Recommendation I.252.7 was prepared by ITU-T Study Group 2 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 26th of May 1997.

FOREWORD

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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.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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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CALL OFFERING SUPPLEMENTARY SERVICES: EXPLICIT CALL TRANSFER

(Geneva, 1997)

1 Definition

Explicit Call Transfer is an ISDN supplementary service which enables a user who has two calls, each of which can be an incoming or an outgoing call, to connect the other parties in the two calls.

2 Description

2.1 General description

Two methods of call transfer are identified. The Explicit Call Transfer (ECT) supplementary service is described below. The other is described in Recommendation I.252.1. The **Explicit Call Transfer supplementary service** enables a user to transform two of that user's calls, each of which can be an incoming or an outgoing call, into a new call between the other parties in the two calls. Prior to transfer, one of the two calls shall be answered, the other call can be either alerting or answered, depending on a network option. Calls incoming to the served user must have been answered.

2.2 Specific terminology

This Recommendation defines the following terms:

2.2.1 served user, other parties: The served user is the user who subscribes to and invokes the explicit call transfer supplementary service. This user is also referred to as "user A".

The other parties associated with the explicit call transfer supplementary service are defined as follows:

- user B is the other party in one (the answered) call;
- user C is the other party in the second call. This user can also be referred to as "the third party".

2.2.2 held call, call not held: A held call is a call on which the call hold supplementary service (see Recommendation I.253.2) is currently in operation.

A call which is not held is a call on which the call hold supplementary service is not currently in operation.

2.2.3 answered call, alerting call: An answered call is a call on which the connection has been established (see Recommendations I.231 and I.241).

An alerting call is a call on which the called user is being informed of the call (see Recommendations I.231 and I.241), but the connection has not yet been established.

2.3 Qualifications on the applicability to telecommunication services

The explicit call transfer supplementary service is applicable to all circuit-switched basic telecommunications services.

3 Procedures

3.1 Provision/withdrawal

The explicit call transfer supplementary service is subscribed to by prior arrangements with the service provider. Subscription to the other call transfer services (i.e. Single-Step Call Transfer and Normal Call Transfer) can be included in this subscription or may be offered independently by the service provider.

Withdrawal of the explicit call transfer supplementary service is made by the service provider upon request by the subscriber or for service provider reasons.

3.2 Normal procedures

3.2.1 Activation/deactivation/registration

None identified.

3.2.2 Invocation and operation

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

Prior to requesting the invocation of the explicit call transfer supplementary service, the following conditions apply:

- one of the calls (referred to as the call between user A and user B) shall have been answered;
- the call between user A and user C shall have been answered, or as a service provider option, this call can be alerting at user C; and
- at most one of the calls shall be on hold.

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

NOTE 2 – At most one of the calls may be on hold, but it is not relevant which call (between user A and user B or between user A and user C) is on hold when the explicit call transfer supplementary service is invoked. For example, a user who has an answered call can put that call on hold and then set up a second call. After that, the served user can interchange the held and not held states of the two calls as appropriate.

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

If user C is being informed of the call at the time of transfer, user C shall continue to be informed of the call, and on answer shall be connected to user B.

The service provider will optionally notify users B and C of the transfer and shall indicate to user B the answered or alerting state of the third party (user C). In the case where a network supports the service provider option in the second paragraph above, then after the transferred alerting call is answered, user B shall again be notified in order to indicate the answered state.

Subject to any restrictions (see 6.17.2 and 6.17.4), the ISDN number of user B shall be indicated to user C.

Subject to any restrictions (see 6.17.2 and 6.17.4), the ISDN number of user C shall be indicated to user B, either:

- at the time of transfer, if the call between user A and user C had been answered; or
- when user B is informed that user C has answered the call, 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 6.17.2 and 6.17.4).

If the call between user A and user C has been answered, user C can also provide a subaddress after receiving the indication that transfer has occurred. If this information is supplied by user C, the network shall deliver it to user B independently of any restrictions (see 6.17.2 and 6.17.4).

If user C answers the call 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 6.17.4) when user B is informed that the call has been answered by user C.

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

3.3 Exceptional procedures

3.3.1 Activation/deactivation/registration

None identified.

3.3.2 Invocation and operation

The explicit call transfer supplementary service request would be rejected if the user invoking the service has not subscribed to the explicit call transfer supplementary service.

Also, the explicit call transfer supplementary service request would be rejected if the network is unsuccessful in connecting user B and user C (e.g. when user C is busy, when there is network congestion, when transfer restrictions are violated, if both calls to user B and user C are unanswered, or if both calls to user B and user C are on hold).

User A would be notified of the cause for rejection and the two calls between user A and user B and user A and user C would remain in the states they were in before the explicit call transfer supplementary service request was received.

In an ISDN, the ECT supplementary service invocation will be rejected if it is detected that an uncontrolled connection would result. An uncontrolled connection is a sequence of ECT invocations that creates a connection in a network which is under no user control. The served user will be notified of the cause for rejection and existing calls will remain in the states they were in before the invocation of the ECT supplementary service.

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, may receive an indication of why no ISDN number is given.

3.4 Alternative procedures

3.4.1 Activation/deactivation/registration

None identified.

3.4.2 Invocation and operation

None identified.

4 Network capabilities for charging

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information.

It shall be possible to charge the subscriber accurately for the service.

5 Interworking requirements

In interworking with some networks, when user B and user C are both non-ISDN users, attached either to non-ISDNs or to private ISDNs, it may not be possible to detect the formation of an uncontrolled connection as the result of an invocation of the ECT supplementary service. In this case, the ECT may be rejected and, if so, the served user will be notified of the cause for rejection and existing calls will remain in the states they were in before the invocation of the ECT supplementary service.

5.1 Interworking with non-ISDNs

If a transferred user is not within the ISDN, it may not be possible to notify 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 providers).

5.2 Interworking with private ISDNs

As a network option, the ECT supplementary service may be invoked by a private network when the following conditions are fulfilled:

- both calls shall have been answered or as a network option, one of the calls may be alerting;
- neither call shall be a held call;
- both users B and C shall be connected via the public network; and
- both calls A-B and A-C shall be connected to the private network via the same local exchange.

In some cases it may not be possible to invoke the ECT supplementary service if the private network is connected to the ISDN via multiple basic and/or primary rate accesses.

When a remote user is on a different network (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 Recommendation E.164).

If interworking between the public ISDNs and private ISDNs occurs with user A attached to a public ISDN, and user B and user C both non-ISDN users attached to private ISDNs or possibly to non-ISDNs interworking with private ISDNs, the cooperation of the public ISDNs and private ISDNs involved is required in order to determine that the resulting connection would contain at least one user able to terminate the transferred call. Depending on implementation, this cooperation will not necessarily be available. Such a case is addressed at the beginning of clause 5. If the result of this cooperation is that an uncontrolled connection would result, the ECT supplementary service invocation shall be rejected and the served user shall be notified of the cause of the rejection and existing calls will remain in the states they were in before the invocation of the ECT supplementary service.

6 Interaction with other supplementary services

Where text is given in this clause, it should be considered that this text contains the interaction between the explicit call transfer supplementary service and the other supplementary services.

If no text is provided for a particular interaction, the interaction can be found in Recommendation I.252.1 (1988), or in the text of the other supplementary service.

6.1 Advice of charge services

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

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 should be considered as completed.

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

6.1.2 Charging information during the call (AOC-D)

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 should be sent as a subtotal charge for the call. The advice of charge: charging information during the call supplementary service should then be considered as completed.

NOTE – If user A had activated the advice of charge: charging information during the call supplementary service, for each of its two calls, with user B and user C, then user A will receive information separately for both of these calls.

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

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

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

- a) the charging information for the transferred call should be sent to user A when the transferred call is terminated; or
- b) when the calls are transferred, user A should be informed that the charging information is not available for this call and will receive this information separately for each of the two calls prior to transfer for which this user had invoked AOC-E. The advice of charge: charging information at the end of the call supplementary service should then be considered as completed.

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

6.2 Call Hold (HOLD)

The invocation of the explicit call transfer supplementary service should 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 should remain on hold by that user. User A shall be replaced as the held user by the other user (user C or user B).

6.3 Call transfer services

NOTE – Call transfer can be invoked simultaneously by the users on an answered call, but this is not regarded as the normal situation. The network will not expressly prevent this occurring, but likewise cannot guarantee that the notifications supplied to the users involved will be sensible to those users. There can be more than one notification generated due to multiple call transfers and the arrival of such notifications is dependent on the timing of their invocation by the users involved in the call. The network will transfer these notifications when they are generated.

6.3.1 Explicit Call Transfer

It shall be possible for both users (user A and user B) in a normal call, who have each subscribed to the call transfer services, to simultaneously transfer the call. That is, if user A and user B are active in an established call, user A could invoke the ECT supplementary service in order to transfer the call to user C whilst user B could invoke the normal call transfer supplementary service in order to transfer the call to user D. Call progress signals and other notifications will be delivered to the appropriate party at the time the signal is received.

6.3.2 Normal Call Transfer

It shall be possible for both users (user A and user B) in a normal call, who have each subscribed to the call transfer services, to simultaneously transfer the call. That is, if user A and user B are active in an established call, user A could invoke the ECT supplementary service in order to transfer the call to user C whilst user B could invoke the normal call transfer supplementary service in order to transfer the call to user D. Call progress signals and other notifications will be delivered to the appropriate party at the time the signal is received.

6.4 Call Waiting (CW)

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

6.5 Closed User Group (CUG)

The intention of CUG is to allow some connections and prohibit others; call transfer must not compromise this intention.

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.

6.6 Completion of calls services

6.6.1 Completion of Calls on No Reply (CCNR)

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

6.6.2 Completion of Calls to Busy Subscribers (CCBS)

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

6.7 Conference services

6.7.1 Conference calling (CONF)

The conference controller cannot transfer the conference to another user.

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

6.7.2 Meet-Me Conference (MMC)

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 the connection to that user has been established.

6.7.3 Preset Conference Calling (PCC)

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

6.7.4 Three-Party Service (3PTY)

A user who has invoked the three-party supplementary service cannot invoke the explicit call transfer supplementary service in order to transfer either of the calls involved. The user shall cancel the three-party supplementary service in order to transfer either of the calls involved in the three-way conversation.

6.8 Diversion services

6.8.1 Call Deflection (CD)

No impact, i.e. neither supplementary service affects 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.

6.8.2 Call Forwarding Busy (CFB)

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

6.8.3 Call Forwarding No Reply (CFNR)

No impact, i.e. neither supplementary service affects 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.

6.8.4 Call Forwarding Unconditional (CFU)

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

6.8.5 Selective Call Forwarding (SCF)

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

6.9 Direct-Dialling-In (DDI)

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

6.10 In-call Modification (IM)

The in-call modification supplementary service is only available to the parties that are involved with the call at that time. That is, user A is not able to invoke the in-call modification supplementary service after the ECT has successfully taken place.

6.11 ISDN Freephone Service (IFS)

If user A is the answering point for the ISDN freephone supplementary service, and that user transfers the freephone call, the user who called the freephone number shall neither receive information that the call has been transferred, nor receive the transferred-to-number.

Note that 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 that other user.

6.12 Line Hunting (LH)

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

6.13 Malicious Call Identification (MCID)

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 last transferring user (user A).

6.14 Multi-Level Precedence and Preemption (MLPP)

After transfer, each connection of the transferred call maintains the precedence level that it was assigned when that connection of the call was established. Thus the resulting call may consist of two connections at different precedent levels.

6.15 Multiple Subscriber Number (MSN)

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

6.16 Name identification services

6.16.1 Calling Name Identification Presentation (CNIP)

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

6.16.2 Calling Name Identification Restriction (CNIR)

User B's and user C's restriction requirements for the original calls shall be used to restrict the presentation of that user's name information to the other user in the transferred call.

6.17 Number identification services

6.17.1 Calling Line Identification Presentation (CLIP)

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

6.17.2 Calling Line Identification Restriction (CLIR)

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.

6.17.3 Connected Line Identification Presentation (COLP)

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

6.17.4 Connected Line Identification Restriction (COLR)

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

6.18 Outgoing Call Barring (OCB)

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

6.19 Reverse charging (REV)

Any case B request made by the calling user should be rejected by the network. If charging is done on a per leg basis, case B or case C may be requested by either user, if that user is a called user, for their leg of the call.

6.20 Sub-addressing (SUB)

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

6.21 Support of Private Numbering Plans (SPNP)

Assume that user A has an established call with user B and wishes to transfer this call with user B to user C. The numbers presented to users B and C after successful transfer should be in accordance with the PNP if the same PNP is used on both calls. Otherwise the numbers should be in accordance with the E.164 numbering plan.

6.22 Terminal Portability (TP)

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

6.23 User-to-User Signalling (UUS)

When Explicit Call Transfer is invoked, any UUS service that has previously been activated on either leg, shall be cancelled by the network.

NOTE – No specific notification will be sent to the users of the resulting call when an activated UUS service is no longer available.

It shall be the responsibility of the users on the resulting call to renegotiate Service 3, if required.

7 Dynamic description

The dynamic description of this service is shown in Figure 2/I.252.

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