
**Information technology —
Telecommunications and information
exchange between systems — Private
Integrated Services Network —
Specification, functional model and
information flows — Call Transfer
supplementary service**

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d'information entre systèmes — Réseau privé à intégration de
services — Spécification, modèle fonctionnel et flux d'informations —
Service supplémentaire de transfert d'appel*

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 13865 was prepared by ECMA (as ECMA-177) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

This second edition cancels and replaces the first edition (ISO/IEC 13865:1995), which has been technically revised.

Introduction

This International Standard is one of a series of Standards defining services and signalling protocols applicable to Private Integrated Services Networks (PISNs). The series uses ISDN concepts as developed by ITU-T and conforms to the framework of International Standards for Open Systems Interconnection as defined by ISO/IEC.

This International Standard specifies the Call Transfer supplementary service.

This International Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC 1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Call Transfer supplementary service

1 Scope

This International Standard specifies Supplementary Service Call Transfer (SS-CT), which is applicable to various basic services supported by Private Integrated Services Networks (PISNs). Basic services are specified in ISO/IEC 11574.

SS-CT is a supplementary service which enables a user to transform two of that user's calls (of which one must be answered) into a new call between the other two users of the two calls.

Supplementary service specifications are produced in three stages, according to the method described in ETS 300 387. This International Standard contains the stage 1 and stage 2 specifications of SS-CT. The stage 1 specification (clause 6) specifies the supplementary service as seen by users of PISNs. The stage 2 specification (clauses 7 and 8) identifies the functional entities involved in the supplementary service and the information flows between them.

This International Standard contains two stage 2 specifications reflecting different ways of operating the service within the network: transfer by join and transfer by rerouting.

2 Conformance

In order to conform to this International Standard, a stage 3 standard shall specify signalling protocols and equipment behaviour that are capable of being used in a PISN which supports the supplementary services specified in this International Standard. This means that, to claim conformance a stage 3 standard is required to be adequate for the support of those aspects of clause 6 (stage 1) and clauses 7 and 8 (stage 2) which are relevant to the interface or equipment to which the stage 3 standard applies.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 11574:2000, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit-mode 64 kbit/s bearer services - Service description, functional capabilities and information flows*

ISO/IEC 11579-1:1994, *Information technology - Telecommunications and information exchange between systems - Private integrated services network - Part 1: Reference configuration for PISN Exchanges (PINX)*

ISO/IEC 13864:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Name identification supplementary services*

ISO/IEC 14136:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Identification supplementary services*

ETS 300 387:1994, *Private Telecommunication Network (PTN); Method for the specification of basic and supplementary services*

ITU-T Rec. I.112:1993, *Vocabulary of terms for ISDNs*

ITU-T Rec. I.210:1993, *Principles of telecommunication services supported by an ISDN and the means to describe them*

ITU-T Rec. Z.100:1999, *Specification and description language (SDL)*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1 External definitions

This International Standard uses the following terms defined in other documents:

- Basic Service (ITU-T Rec. I.210)
- Connection (ITU-T Rec. I.112)
- Private Integrated Services Network (PISN) (ISO/IEC 11579-1)
- Private Integrated services Network eXchange (PINX) (ISO/IEC 11579-1)
- Service (ITU-T Rec. I.112)
- Signalling (ITU-T Rec. I.112)
- Supplementary Service (ITU-T Rec. I.210)
- User (ISO/IEC 11574)

This International Standard refers to the following basic call functional entities (FEs) defined in ISO/IEC 11574:

- Call Control (CC)
- Call Control Agent (CCA)

This International Standard refers to the following basic call inter-FE relationships defined in ISO/IEC 11574:

- r1
- r2
- r3

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This International Standard refers to the following basic call information flows defined in ISO/IEC 11574:

- Channel_Acknowledge request/indication
- Release request/indication
- Release response/confirmation
- Setup request/indication
- Setup response/confirmation

This International Standard refers to the following basic call information flow elements defined in ISO/IEC 11574:

- Call History (CH)
- Connected Number (CN)
- Connected Subaddress (CS)

This International Standard refers to the following Connected Line Identification Presentation information flow elements defined in ISO/IEC 14136:

- Connected Number (CN)
- Connected Subaddress (CS)

4.2 Other definitions

4.2.1 Additional network feature

A capability, over and above that of a basic service, provided by a PISN, but not directly to a PISN user.

4.2.2 Alerting

The state of the secondary call when the called user is being alerted but has not yet answered.

4.2.3 Answered

The state of the primary or secondary call after the called user has answered.

4.2.4 Call, basic call

An instance of the use of a basic service.

4.2.5 Primary call

One of the calls involved in the transfer. In the case of a transfer involving an unanswered call, the primary call is the answered call. In the case where both calls are already answered, the primary call is chosen arbitrarily by the network.

4.2.6 Secondary call

The other call involved in the transfer.

4.2.7 Transfer by Join

The effecting of transfer by joining together the connections of the primary and secondary calls at User A's PINX.

4.2.8 Transfer by rerouteing

The effecting of transfer by establishing a new connection to replace all or part of the connections of the primary and secondary calls.

4.2.9 User A

The served user, i.e. the user requesting Call Transfer.

4.2.10 User B

The other user in User A's primary call.

4.2.11 User C

The other user in User A's secondary call.

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5 Acronyms	<u>ISO/IEC 13865:2003</u>
AI	Alerting Indication
CC	Call Control (functional entity)
CCA	Call Control Agent (functional entity)
cfm	confirmation
CH	Call History (information flow element)
CID	Call Identity (information flow element)
CN	Connected Number (information flow element)
CS	Connected Subaddress (information flow element)
CUG	Closed User Group
ED	End Designation (information flow element)
FE	Functional Entity
ind	indication
ISDN	Integrated Services Digital Network
LCI	Local Call Identities
PINX	Private Integrated services Network eXchange
PISN	Private Integrated Services Network
req	request
resp	response
RN	Rerouteing Number (information flow element)

SDL	Specification and Description Language
SS-CT	Supplementary Service Call Transfer
TDR	Terminal Detail Request
TE	Terminal Equipment
TIDR	Transfer Identity Result (information flow element)
TINR	Transfer Initiate Result (information flow element)
TIVR	Transfer Invoke Result (information flow element)

6 SS-CT stage 1 specification

6.1 Description

6.1.1 General description

SS-CT is a supplementary service which enables a served user (User A) to transform two of that users calls into a new call between the other two users of the two calls (User B and User C). Each call can either be an incoming call to User A or an outgoing call from User A. After successful invocation of SS-CT, User B and User C will no longer be able to communicate with User A.

One of the calls may be an outgoing call that has not been answered by the other user (User C). After successful invocation of SS-CT User A will no longer be able to communicate with User B. User B and User C will be in a position to communicate with each other as soon as User C has answered.

NOTE - The establishment of either call as part of a request for transfer is outside the scope of this International Standard. This International Standard assumes that both calls have already been established when the request for call transfer is made. This does not preclude an implementation whereby a single user request causes the establishment of a call and its subsequent transfer.

6.1.2 Qualifications on applicability to telecommunications services

SS-CT is applicable to all basic services defined in ISO/IEC 11574.

6.2 Procedures

6.2.1 Provision/withdrawal

SS-CT shall be generally available to all PISN users with the ability to invoke it.

6.2.2 Normal procedures

6.2.2.1 Activation/deactivation/registration/interrogation

Not applicable.

6.2.2.2 Invocation and operation

A Call Transfer request from a user (User A) shall be accepted only if it identifies two of that user's calls where:

- both calls (to/from User B and to/from User C) have been answered; or
- one call (to/from User B) has been answered and the other is an outgoing call which is alerting User C; or
- one call (to/from User B) has been answered and the other is an unanswered outgoing call to User C in a non-ISDN.

It shall not be necessary for User A to place either call on hold prior to invocation, although either or both calls may be held.

The network shall ensure that the transfer attempt does not allow an illegal connection to be made, for example one which would infringe CUG restrictions between User B and User C, or one which would result in a connection with a mixture of incompatible bearer capabilities.

NOTE 1 - It is User A's responsibility to ensure that the two calls are otherwise compatible.

Bearer capabilities shall be considered compatible if they are the same. Bearer capabilities shall also be considered compatible if the only attribute that differs is Information Transfer Capability and if one call has the value "Speech" and the other call is interworking with a non-ISDN and has the value " 3,1 kHz audio."

NOTE 2 - The provision of interworking functions between different bearer capabilities is outside the scope of this International Standard.

The result of successful Call Transfer shall be a new call between users B and C, at which point the original connections to User A shall be released. Both users B and C shall be informed of the transfer and the name and number of the other user (if available and not subject to restriction), and whether the other user is still being alerted.

The network shall permit subaddresses to be exchanged between User B and User C after transfer.

If User C is being alerted at the time of completion of transfer, it shall continue to be alerted, and on answer shall be connected to User B.

NOTE 3 - If the call resulting from the invocation of Call Transfer before answer fails to progress to the answered state within a certain time other actions can be taken e.g., User A can be recalled and on answer be connected to User B. The definition of procedures to support recall is outside the scope of this International Standard.

6.2.3 Exceptional procedures

6.2.3.1 Activation/deactivation/registration/interrogation

Not applicable.

6.2.3.2 Invocation and operation

Call Transfer shall be rejected under the following circumstances:

- if invalid call identities are specified;
- if neither of the calls is answered;
- if only one call is answered and the other is not an outgoing call which is either alerting a distant user or interworking with a non-ISDN;
- if the two calls have incompatible bearer capabilities;
- if interconnection of User B and User C is not permitted.

If transfer is rejected, User A shall be informed of the reason and the existing calls shall be unaffected.

6.3 Interactions with other supplementary services and ANFs

Interactions with other supplementary services and ANFs for which PISN standards were available at the time of publication of this International Standard are specified below.

6.3.1 Calling Line Identification Presentation (SS-CLIP)

No interaction.

6.3.2 Connected Line Identification Presentation (SS-COLP)

No interaction.

6.3.3 Calling/Connected Line Identification Restriction (SS-CLIR)

User B's and C's restriction requirements from the original call shall be used to restrict the presentation of that user's number to the other user in a transferred call.

6.3.4 Calling Name Identification Presentation (SS-CNIP)

No interaction.

6.3.5 Connected Name Identification Presentation (SS-CONP)

No interaction.

6.3.6 Calling/connected Name Identification Restriction (SS-CNIR)

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

6.3.7 Completion of Calls to Busy Subscribers (SS-CCBS)

No interaction.

6.3.8 Completion of Calls on No Reply (SS-CCNR)

No interaction.

6.3.9 Call Forwarding Services

If Call Transfer occurs while User C is being alerted, the resulting call can subsequently undergo Call Forwarding on No Reply.

Call Transfer shall not affect the way in which chains of forwarding are controlled. Thus any hop counter value maintained in order to determine whether a forwarding may occur shall have the same value after transfer as it had prior to the transfer. The fact that a transfer has taken place shall not affect the way in which the counter value is subsequently modified due to forwarding.

6.3.10 Path Replacement (ANF-PR)

No interaction.

NOTE - Path Replacement may be invoked as a direct consequence of performing transfer if the transfer is achieved by joining as opposed to rerouting.

6.4 Interworking considerations

Call Transfer may take place when one or both of the calls involves interworking with a public ISDN or a public or private non-ISDN.

6.4.1 User B and/or User C in another network

Since the execution of the Call Transfer service need only involve the interconnection within the PISN of one end of each of two established connections, the nature of the network (ISDN or non-ISDN) containing User B or User C makes no difference to the operation of the service as seen by User A.

The PISN shall pass on any notifications associated with the transfer to the other network if the other network is capable of receiving this information, the possibilities being the notifications that transfer has taken place, whether the transfer has taken place prior to answer, the name and number (if appropriate) of the other User And the other user's subaddress and compatibility information.

In the case where User B and User C are in the same network, the PISN may be able to cooperate with that network in order to effect Call Transfer in that network.

6.4.2 User A in another network

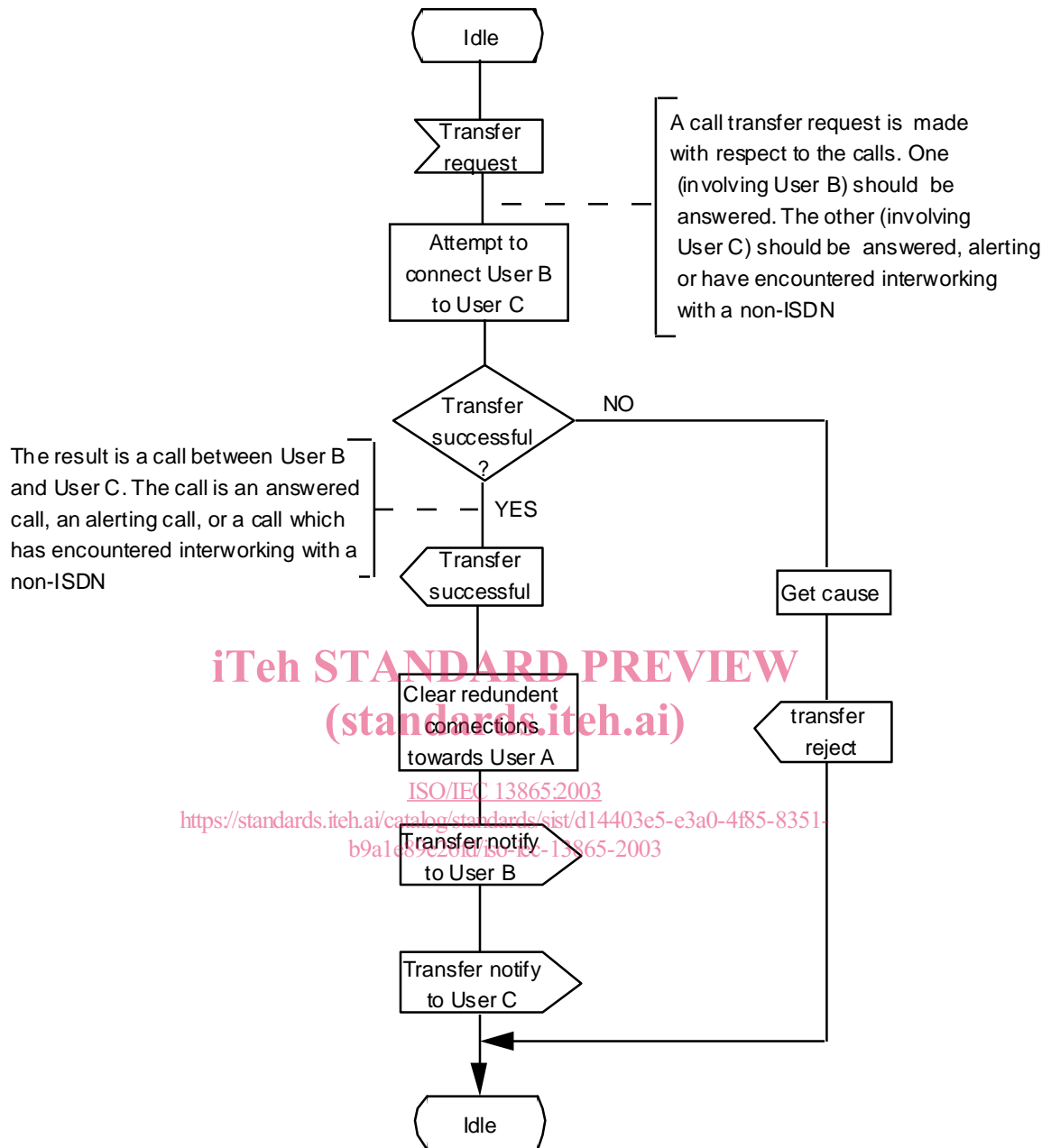
The PISN shall accept transfer notifications from another network and pass them on to the PISN user. Transfer notifications include notifications that transfer has taken place, whether the transfer has taken place prior to answer, the name and number of the other user and the other user's subaddress and compatibility information. Where this information is not provided, a PISN user will have to rely on in-band information.

6.5 Overall SDL

Figure 1 contains the dynamic description of SS-CT using the Specification and Description Language (SDL) defined in ITU-T Rec. Z.100. The SDL process represents the behaviour of the network in providing SS-CT. The relationship of this process to the basic call process is indicated in the annotations.

Input signals from the left and output signals to the left represent primitives from and to User A.

Input signals from the right and output signals to the right represent primitives from and to users B and C.



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Figure 1 - SS-CT, Overall SDL