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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Single Step Call Transfer supplementary service

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseau privé à intégration de services — Protocole de signalisation d'interéchange — Service supplémentaire de transfert d'appel à pas unique

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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 19460 was prepared by ECMA (as ECMA-300) 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 19460:2001), which has been technically revised.

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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 signalling protocol for use at the Q reference point in support of the Call Transfer supplementary service. The protocol defined in this International Standard forms part of the PSS1 protocol (informally known as QSIG).

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 — Inter-exchange signalling protocol — Single Step Call Transfer supplementary service

1 Scope

This International Standard specifies the signalling protocol for the support of the Single Step Call Transfer supplementary service (SS-SSCT) at the Q reference point between Private Integrated Network services eXchanges (PINXs) connected together within a Private Integrated Services Network (PISN).

SS-SSCT is a supplementary service which enables a user, user A, to transform an existing call between user A and user B into a new call between user B and a user C whereby user A does not have a call established with user C prior to call transfer.

The Q reference point is defined in ISO/IEC 11579-1.

Service specifications are produced in three stages and according to the method specified in ETS 300 387. This International Standard contains the stage 3 specification for the Q reference point and satisfies the requirements identified by the stage 1 and stage 2 specifications in ISO/IEC 19459.

The signalling protocol for SS-SSCT operates on top of the signalling protocol for basic circuit switched call control, as specified in ISO/IEC 11572, and uses certain aspects of the generic procedures for the control of supplementary services specified in ISO/IEC 11582.

This International Standard also specifies additional signalling protocol requirements for the support of interactions at the Q reference point between Single Step Call Transfer and other supplementary services and ANFs.

This International Standard is applicable to PINXs which can interconnect to form a PISN.

2 Conformance

In order to conform to this International Standard, a PINX shall satisfy the requirements identified in the Protocol Implementation Conformance Statement (PICS) proforma in annex A.

Conformance to this International Standard includes conforming to those clauses that specify protocol interactions between SS-SSCT and other supplementary services and ANFs for which signalling protocols at the Q reference point are supported in accordance with the stage 3 standards concerned.

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 11571:1998, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Networks - Addressing*

ISO/IEC 11572:2000, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit mode bearer services - Inter-exchange signalling procedures and protocol*

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 11582:2002, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Generic functional protocol for the support of supplementary services - Inter-exchange signalling procedures and protocol*

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ISO/IEC 13868:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Name identification supplementary services*

ISO/IEC 13869:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Transfer supplementary service*

ISO/IEC 13873:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Diversion supplementary services*

ISO/IEC 13874:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Path Replacement additional network feature*

ISO/IEC 15050:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Advice Of Charge supplementary services*

ISO/IEC 15054:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Interception additional network feature*

ISO/IEC 15056:1997, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Transit counter additional network feature*

ISO/IEC 15772:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Common Information additional network feature*

ISO/IEC 15992:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Priority Interruption and Call Priority Interruption Protection supplementary services*

ISO/IEC 19459:2001, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Single Step Call Transfer Supplementary Service*

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. Q.950:2000, *Supplementary services protocols, structure and general principles*

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:

- Application Protocol Data Unit (APDU) (ISO/IEC 11582)
- Basic Service (ITU-T Rec. I.210)
- Gateway PINX (ISO/IEC 11572)
- Complete Number (ISO/IEC 11571)
- Interpretation APDU (ISO/IEC 11582)
- Network Facility Extension (NFE) (ISO/IEC 11582)
- New Call, New Connection (ISO/IEC 19459)
- Original Call, Original Connection (ISO/IEC 19459)
- Originating PINX (ISO/IEC 11582)
- Private Integrated Services Network (PISN) (ISO/IEC 11579-1)
- Private Integrated services Network eXchange (PINX) (ISO/IEC 11579-1)

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- Subsequent PINX (ISO/IEC 11582)
- Signalling (ITU-T Rec. I.112)
- Supplementary Service (ITU-T Rec. I.210)
- Supplementary Service Control Entity (ISO/IEC 11582)
- Terminating PINX (ISO/IEC 11582)
- Transit PINX (ISO/IEC 11582)
- User (ISO/IEC 11574)
- User A, Transferring user (ISO/IEC 19459)
- User B, Transferred user (ISO/IEC 19459)
- User C, Transferred-to user (ISO/IEC 19459)

4.2 Other definitions

4.2.1 Rerouting number

The number of the Transferred-to user.

4.2.2 Rerouting PINX

A PINX on the call path of the original call, that reroutes that call to user C. This can either be the Transferring, the Transferred or a Transit PINX being capable of performing the rerouting function.

4.2.3 Transferred PINX

The End PINX which is on the end of the original call nearest to user B.

4.2.4 Transferred-To PINX

The End PINX which is on the end of the new call nearest to user C.

4.2.5 Transferring PINX

The End PINX which initiates single step call transfer procedures on behalf of user A.

5 Acronyms

APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation no. 1
ISDN	Integrated Services Digital Network
NFE	Network Facility Extension
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated services Network eXchange
PISN	Private Integrated Services Network
SDL	Specification and Description Language
SS-SSCT	Supplementary Service Single Step Call Transfer

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6 Signalling protocol for the support of SS-SSCT

6.1 SS-SSCT description

SS-SSCT is a supplementary service which enables a user, user A, to transform an existing call between user A and user B into a new call between user B and a user C whereby user A does not have a call established with user C prior to call transfer.

This supplementary service is applicable to all basic services defined in ISO/IEC 11574.

6.2 SS-SSCT operational requirements

6.2.1 Provision/Withdrawal

Provision and withdrawal shall be in accordance with 6.2.1 of ISO/IEC 19459.

6.2.2 Requirements on a Transferring PINX

The basic call procedures specified in ISO/IEC 11572 shall be supported.

Generic procedures for the call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.3 Requirements on a Rerouting PINX

The basic call procedures specified in ISO/IEC 11572 shall be supported.

Generic procedures for the call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.4 Requirements on a Transferred PINX

The basic call procedures specified in ISO/IEC 11572 shall be supported.

Generic procedures for the call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.5 Requirements on a Transferred-To PINX

The basic call procedures specified in ISO/IEC 11572 shall be supported.

Generic procedures for the call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.6 Requirements on a Transit PINX

The basic call procedures specified in ISO/IEC 11572 shall be supported.

Generic procedures for the call-related control of supplementary services, as specified in ISO/IEC 11582 for a Transit PINX, shall apply.

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6.3 SS-SSCT coding requirements

6.3.1 Operations

The operations defined in Abstract Syntax Notation number 1 (ASN.1) in table 1 shall apply. The notation is in accordance with ITU-T Rec. X.680 and X.690. The ITU-T Rec. X.208 and X.209 superseded version is in annex G.

Table 1 - Operations in support of SS-SSCT

```
Single-Step-Call-Transfer-Operations-asn1-97
{ iso(1) standard (0) pss1-single-step-call-transfer (19460)
single-step-call-transfer-operations-asn1-97 (1)}

DEFINITIONS EXPLICIT TAGS ::=

BEGIN
IMPORTS
        OPERATION, ERROR FROM Remote-Operations-Information-Objects
                { joint-iso-itu-t (2) remote-operations (4) informationObjects(5) version1(0) }
        EXTENSION, Extension{} FROM Manufacturer-specific-service-extension-class-asn1-97
                { iso (1) standard (0) pss1-generic-procedures (11582) msi-class-asn1-97 (11) }
        Name FROM Name-Operations-asn1-97
                {iso(1) standard(0) pss1-name (13868) name-operations-asn1-97 (1)}
        supplementaryServiceInteractionNotAllowed, notAvailable, invalidCallState
                FROM General-Error-List
                { ccitt recommendation q 950 general-error-list (1) }
        PresentedAddressScreened, PartyNumber FROM Addressing-Data-Elements-asn1-97
                {iso(1) standard (0) pss1-generic-procedures (11582)
                addressing-data-elements-asn1-97 (20)}
        PSS1InformationElement FROM PSS1-generic-parameters-definition-asn1-97
                {iso(1) standard (0) pss1-generic-procedures (11582)
                pss1-generic-parameters-asn1-97 (17)}
        callTransferUpdate, callTransferComplete, callTransferActive, subaddressTransfer,
        invalidRerouteingNumber, establishmentFailure FROM Call-Transfer-Operations-asn1-97
                {iso(1) standard (0) pss1-call-transfer (13869) call-transfer-operations-asn1-97 (1)};

Single-Step-Call-Transfer-Operations OPERATION ::= { ssctInitiate | ssctSetup | ssctPostDial |
ssctDigitInfo }

ssctInitiate    OPERATION ::= {
                -- sent from the Transferring PINX to the Rerouting PINX
                ARGUMENT    SSCTInitiateArg
                RESULT      DummyRes
                ERRORS      { notAvailable | invalidCallState | invalidRerouteingNumber |
                            establishmentFailure | unspecified |
                            supplementaryServiceInteractionNotAllowed }
                CODE        local: 99}
```

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Table 1 - Operations in support of SS-SSCT (continued)

```
ssctSetup           OPERATION ::= {
                    -- sent from the Rerouting PINX to the Transferred-To PINX
                    ARGUMENT            SSCTSetupArg
                    RETURN RESULT       FALSE
                    ALWAYS RESPONDS     FALSE
                    CODE                local: 100}

ssctPostDial        OPERATION ::= {
                    -- sent from the Rerouting PINX to the Transferred PINX
                    ARGUMENT      DummyArg
                    RETURN RESULT       FALSE
                    ALWAYS RESPONDS     FALSE
                    CODE                local: 101}

ssctDigitInfo       OPERATION ::= {
                    -- sent from the Transferred PINX to the Rerouting PINX
                    ARGUMENT      SSCTDigitInfoArg
                    RETURN RESULT       FALSE
                    ALWAYS RESPONDS     FALSE
                    CODE                local: 102}

DummyArg  ::=       CHOICE {
                    null                NULL,
                    single              [1]   IMPLICIT Extension{{SSCTExtSet}},
                    multiple            [2]   IMPLICIT SEQUENCE OF Extension{{SSCTExtSet}}}

DummyRes  ::=       CHOICE {
                    null                NULL,
                    single              [1]   IMPLICIT Extension{{SSCTExtSet}},
                    multiple            [2]   IMPLICIT SEQUENCE OF Extension{{SSCTExtSet}}}

SSCTInitiateArg ::= SEQUENCE {
                    rerouteingNumber    PartyNumber,    -- Transferred-To Number
                    transferredAddress  PresentedAddressScreened,
                    awaitConnect        AwaitConnect,
                    transferredName     [1] Name                          OPTIONAL,
                    transferringAddress [2] PresentedAddressScreened      OPTIONAL,
                    transferringName    [3] Name                          OPTIONAL,
                    argumentExtension   CHOICE {
                          single        [4] IMPLICIT Extension{{SSCTExtSet}},
                          multiple      [5] IMPLICIT SEQUENCE OF Extension{{SSCTExtSet}}
                                                }                         OPTIONAL
                                      }

AwaitConnect ::=                  BOOLEAN
                    -- FALSE = release the original call upon ALERTING received
                    -- TRUE = release the original call upon CONNECT received
```


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Table 1 - Operations in support of SS-SSCT (concluded)

```
SSCTSetupArg ::=  SEQUENCE {
                  transferringAddress    [1] PresentedAddressScreened   OPTIONAL,
                  transferringName       [2] Name                       OPTIONAL,
                  argumentExtension      CHOICE {
                        single           [3] IMPLICIT Extension{{SSCTExtSet}},
                        multiple         [4] IMPLICIT SEQUENCE OF Extension{{SSCTExtSet}}
                                               }                        OPTIONAL
                                    }

SSCTDigitInfoArg ::=  SEQUENCE {
                  reroutingNumber[1] PartyNumber                OPTIONAL,
                                     -- remaining digits of the Transferred-To Number
                  sendingComplete    [2] IMPLICIT NULL          OPTIONAL,
                  argumentExtension  CHOICE {
                        single       [3] IMPLICIT Extension{{SSCTExtSet}},
                        multiple     [4] IMPLICIT SEQUENCE OF Extension{{SSCTExtSet}}
                                               }                OPTIONAL
                                    }

SSCTExtSet EXTENSION ::= {…}

unspecified  ERROR ::= {
             PARAMETER          Extension{{SSCTExtSet}}
             CODE               local: 1008}

END          -- of SSCT Operations-asn1-97
```

6.3.2 Information elements

6.3.2.1 Facility information element

APDUs of the operations defined in 6.3.1 shall be coded in the Facility information element in accordance with ISO/IEC 11582.

When conveying the invoke APDU of the operations defined in 6.3.1, the destinationEntity data element of the NFE shall contain value endPINX.

When conveying the invoke APDU of operation ssctSetup, the Interpretation APDU shall contain value discardAnyUnrecognisedInvokePdu.

When conveying the invoke APDU of operations ssctInitiate, ssctPostDial or ssctDigitInfo the Interpretation APDU shall be included with the value rejectAnyUnrecognisedInvokePdu or omitted.

6.3.2.2 Information elements embedded in the Facility information element

APDUs of the operations defined in 6.3.1 may contain information elements defined in and coded according to ISO/IEC 11572. These shall be embedded in data elements of type PSS1InformationElement as specified in annex B of ISO/IEC 11582.

6.3.2.3 Other information elements

Information elements used during the establishment of the new connection shall be coded as specified in ISO/IEC 11572.

6.3.3 Messages

Except for cases where a basic call message is to be conveyed at the same time, the Facility information element shall be conveyed in a FACILITY message as specified in ISO/IEC 11582.

Messages used during the establishment of the new connection and release of the original connection shall be as specified in ISO/IEC 11572 and, where applicable, augmented in ISO/IEC 11582.

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6.4 SS-SSCT state definitions

6.4.1 States at a Transferring PINX

The procedures at the Transferring PINX are written in terms of the following conceptual states existing within the SS-SSCT control entity in that PINX in association with a particular SS-SSCT request from the transferring user.

6.4.1.1 SSCT-Idle

SS-SSCT is not operating.

6.4.1.2 SSCT-Await-Initiate-Response

A ssctInitiate invoke APDU has been sent to the Rerouting PINX.

6.4.2 States at a Rerouting PINX

The procedures at the Rerouting PINX are written in terms of the following conceptual states existing within the SS-SSCT control entity in that PINX.

6.4.2.1 SSCT-Idle

SS-SSCT is not operating.

6.4.2.2 SSCT-Await-Setup-Response-Alert

A ssctInitiate invoke APDU has been received with element waitConnect set to FALSE. A ssctSetup invoke APDU has been sent to the Transferred-To PINX.

6.4.2.3 SSCT-Await-Setup-Response-Connect

A ssctInitiate invoke APDU has been received with element waitConnect set to TRUE. A ssctSetup invoke APDU has been sent to the Transferred-To PINX.

6.4.2.4 SSCT-Await-Info

A ssctPostDial invoke APDU has been sent to the Transferred PINX and further address information can be received in overlap mode.

6.4.3 States at a Transferred PINX

The procedures at the Transferred PINX are written in terms of the following conceptual states existing within the SS-SSCT control entity in that PINX in association with the original call, i.e. a particular call of the transferred user.

6.4.3.1 CT-Idle

SS-SSCT is not operating.

NOTE 1 - As the Transferred PINX acts in the same way as a SS-CT Primary PINX in case of SS-CT by join sub-clause 6.4.2.1 (States at a Primary PINX - CT-Idle) of ISO/IEC 13869 applies accordingly.

6.4.4 States at a Transferred-To PINX

The procedures at the Transferred-To PINX are written in terms of the following conceptual states existing within the SS-SSCT control entity in that PINX.

6.4.4.1 SSCT-Idle

SS-SSCT is not operating.

6.5 SS-SSCT signalling procedures

References in this clause to protocol control states refer to basic call protocol control states defined in ISO/IEC 11572.

NOTE 2 - The specification in this section is based on each of the End PINXs being a different PINX, but this section is also applicable to scenarios where two or more of the four PINXs are the same. In those scenarios some of the signalling procedures and message flows described in this section are internal to the PINX implementation and therefore outside the scope of this International Standard.

Annex C contains some examples of message sequences.

6.5.1 Actions at a Transferring PINX

The SDL representation of procedures at a Transferring PINX is shown in D.1 of annex D.

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6.5.1.1 Normal Procedures

On receipt of a valid request for SS-SSCT from user A while in state SSCT-Idle for a call between user B and user A which is in protocol control state Active (the original call), the Transferring PINX shall

- send a ssctInitiate invoke APDU in a FACILITY message towards the Transferred PINX using the call reference of the original call. The ssctInitiate invoke APDU shall include the following elements:
  - awaitConnect set to TRUE if the original call shall be released after a CONNECT message from the Transferred-To PINX and set to FALSE if it shall be released on receipt of an ALERTING message from the Transferred-To PINX;
  - rerouteingNumber set to the party number of the transferred-to user (i.e., user C), as far as available;
  - transferredAddress set to the address of the transferred user, i.e. user B;
  - optionally transferredName set to the name of the transferred user, i.e. user B;
  - optionally elements transferringAddress and transferringName set to the address and name of the transferring user, i.e. user A;
- start Timer T1;
- enter state SSCT-Await-Initiate-Response.

On receipt in state SSCT-Await-Initiate-Response of a DISCONNECT message with a ssctInitiate return result APDU from the Rerouting PINX, using the call reference of the original call, the Transferring PINX shall continue call clearing of the original call according to basic call procedures, stop timer T1, and enter state SSCT-Idle.

6.5.1.2 Exceptional Procedures

On receipt in state SSCT-Await-Initiate-Response of a message using the call reference of the original call, and conveying a ssctInitiate reject or return error APDU, the Transferring PINX shall stop timer T1, abort the procedure for single step call transfer and enter state SSCT-Idle. The original call shall continue.

On expiry of timer T1, the Transferring PINX shall abort the procedure for single step call transfer and enter state SSCT-Idle. The original call shall continue.

Upon receiving in state SSCT-Await-Initiate-Response an indication from basic call control that the original call has been cleared, the Transferring PINX shall stop Timer T1 and enter state SSCT-Idle.

6.5.2 Procedures at the Rerouting PINX

The SDL representation of procedures at a Rerouting PINX is shown in D.2 of annex D.

6.5.2.1 Normal procedures

On receipt in state SSCT-Idle of a FACILITY message containing a ssctInitiate invoke APDU while in protocol control state Active, the Rerouting PINX shall determine whether it can perform the SSCT rerouting request. If so, it shall attempt to establish a new connection by selecting a route determined by the contents of rerouteingNumber (i.e. to the Transferred-To PINX) received within the argument of ssctInitiate. If a B-channel is available and if enough digits of the reroutingNumber are present, a SETUP message shall be sent using a new call reference in accordance with the procedures of ISO/IEC 11572. The SETUP message shall contain the following information elements:

- Bearer capability, containing the Bearer Capability information of the original call;
- Called party number, containing the number received in rerouteingNumber within the received ssctInitiate invoke APDU;
- Calling party number, containing the number received in transferredAddress within the received ssctInitiate invoke APDU;
- Facility, conveying a ssctSetup invoke APDU with optional elements transferringAddress and transferring Name set as within the received ssctInitiate invoke APDU and optionally conveying a callingName invoke APDU indicating the Name data as received within data element transferredName of the ssctInitiate invoke APDU;
- optionally Calling party subaddress, containing the subaddress information from element transferredAddress within the received ssctInitiate invoke APDU.

If the element awaitConnect within the received ssctInitiate invoke APDU was set to TRUE, state SSCT-Await-Setup-Response-Connect shall be entered. If the element was set to FALSE, state SSCT-Await-Setup-Response-Alert shall be entered.

The protocol procedures of ISO/IEC 11572 shall apply during the establishment of the new connection.

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If the reroutingNumber received within the argument of ssctInitiate invoke APDU is not complete, a ssctPostDial invoke APDU shall be sent to the Transferred PINX, the Rerouting PINX shall enter state SSCT-Await-Info and start timer T3. While in state SSCT-Await-Info, additional information received in the element reroutingNumber of a ssctDigitInfo invoke APDU in a FACILITY message shall be used to select a route for call extension or, if the call has already been extended, passed on to the Subsequent PINX in accordance with ISO/IEC 11572. If the Rerouting PINX regards the number information as complete, or if a sendingComplete element contained in ssctDigitInfo invoke APDU is received, the Rerouting PINX shall process any number information present in the argument, stop timer T3 and initiate call establishment towards the Transferred-To PINX in accordance with ISO/IEC 11572 if not already done and, depending on the element awaitConnect received within the ssctInitiate invoke APDU (see above), enter state SSCT-Await-Setup-Response-Connect or state SSCT-Await-Setup-Response-Alert. Otherwise it shall restart timer T3 and remain in state SSCT-Await-Info. On receipt in state SSCT-Await-Info of a CALL PROCEEDING message. Timer T3 shall be stopped and, depending on the element awaitConnect received within the ssctInitiate invoke APDU (see above), enter state SSCT-Await-Setup-Response-Connect or state SSCT-Await-Setup-Response-Alert.

On receipt in state SSCT-Await-Info of an ALERTING message. Timer T3 shall be stopped and, if the element awaitConnect received within the ssctInitiate invoke APDU is set to TRUE optionally start T2 and enter SSCT-Await-Setup-Response-Connect; otherwise if element awaitConnect is set to FALSE proceed as described below for receiving an ALERTING message in state SSCT-Await-Setup-Response-Alert.

On receipt in state SSCT-Await-Info of a CONNECT message timer, T3 shall be stopped and proceed as described below for receiving a CONNECT message in state SSCT-Await-Setup-Response-Connect.

On receipt in state SSCT-Await-Setup-Response-Alert of an ALERTING or a CONNECT message, using the call reference of the new connection the Rerouting PINX shall

- disconnect the B-channel of the original call and connect the Transferred PINX to the B-channel of the new connection;
- send a DISCONNECT message containing a ssctInitiate return result APDU on the call reference of the original call to the Transferring PINX (completion of the release of the old connection shall be in accordance with the protocol procedures of ISO/IEC 11572);
- send a callTransferComplete invoke APDU within a FACILITY message on the call reference of the original call to the Transferred PINX, element callStatus set to alerting (on receipt of an ALERTING message) or to answered (on receipt of a CONNECT message);
- enter state SSCT-Idle.

On receipt in state SSCT-Idle of a CONNECT message using the call reference of the new connection, the Rerouting PINX shall send a callTransferActive invoke APDU within a FACILITY message on the call reference of the original call to the Transferred PINX.

On receipt in state SSCT-Await-Setup-Response-Connect of an ALERTING message (using the call reference of the new connection), the Rerouting PINX shall

- remain in state SSCT-Await-Setup-Response-Connect;
- optionally start Timer T2.

On receipt in state SSCT-Await-Setup-Response-Connect of a CONNECT message on the call reference of the new connection, indicating call acceptance by user C, the Rerouting PINX shall

- stop Timer T2 (if started);
- disconnect the B-channel of the original call and connect the Transferred PINX to the B-channel of the new connection;
- send a callTransferComplete invoke APDU within a FACILITY message on the call reference of the original call to the Transferred PINX, element callStatus set to answered;
- send a DISCONNECT message containing a ssctInitiate return result APDU on the call reference of the original call to the Transferring PINX. Completion of the release of the old connection shall be in accordance with the protocol procedures of ISO/IEC 11572;
- enter state SSCT-Idle.

The above mentioned callTransferComplete and callTransferActive invoke APDU's shall contain information as specified in ISO/IEC 13869.

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If the received ALERTING or CONNECT messages also contain a callTransferUpdate invoke APDU with, in the argument, optional elements redirectionNumber, redirectionName and/or basicCallInfoElements, the callTransferUpdate invoke APDU shall be sent to the Transferred PINX within a FACILITY message.

6.5.2.2 Exceptional procedures

If on receipt in state SSCT-Idle of a FACILITY message containing a ssctInitiate invoke APDU and the SSCT rerouting request can not be performed,, the Rerouting PINX shall send a ssctInitiate return error APDU containing error value "notAvailable" to the Transferring PINX in a FACILITY message on the call reference on which the invoke was received.

On expiry of timer T2, or on expiry of T3 if the number information received is not sufficient to proceed or on receipt in state SSCT-Await-Setup-Response-Alert or SSCT-Await-Setup-Response-Connect or SSCT-Await-Info of a call clearing message on the call reference of the new connection, the Rerouting PINX shall

- proceed with call clearing of the new connection in accordance with the procedures of ISO/IEC 11572;
- send a FACILITY message on the call reference of the original call to the Transferring PINX, conveying a ssctInitiate return error APDU, indicating error value establishmentFailure;
- stop Timer T2 (if started);
- stop Timer T3 (if started);
- enter state SSCT-Idle.

On receipt in state SSCT-Await-Setup-Response-Alert, SSCT-Await-Setup-Response-Connect or SSCT-Await-Info of a call clearing message on the call reference of the original call, the Rerouting PINX shall

- proceed with call clearing of the original call in accordance with the procedures of ISO/IEC 11572 (acting as a Transit PINX);
- initiate call clearing of the new call using the procedures of ISO/IEC 11572;
- stop Timer T2 (if started);
- stop Timer T3 (if started);
- enter state SSCT-Idle.

If timer T3 expires and if the number information received so far is considered sufficient, initiate call establishment towards the Transferred-To PINX in accordance with ISO/IEC 11572, if not already done, and depending on the element awaitConnect received within ssctInitiate invoke APDU (see above), enter state SSCT-Await-Setup-Response-Connect or state SSCT-Await-Setup-Response-Alert.

A ssctDigitInfo invoke APDU received in any other state than SSCT-Await-Info shall be ignored.

6.5.3 Actions at a Transferred PINX

The SDL representation of procedures at a Primary PINX is shown in D.3 of annex D.

6.5.3.1 Normal procedures

As the Transferred PINX acts in the same way as a SS-CT Primary PINX in case of SS-CT by join, sub-clause 6.5.2.1 of ISO/IEC 13869 shall apply accordingly.

On receipt in state SSCT-Idle of a FACILITY message from the Rerouting PINX containing a ssctPostDial invoke APDU, additional address information from the transferred user B shall be included in the element reroutingNumber of ssctDigitInfo invoke APDUs and sent in FACILITY messages to the Rerouting PINX. The end of number information transmission may be indicated to the Rerouting PINX by means of a sendingComplete element within the ssctDigitInfo invoke APDU.

6.5.3.2 Exceptional procedures

As the Transferred PINX acts in the same way as a SS-CT Primary PINX in case of SS-CT by join, sub-clause 6.5.2.2 of ISO/IEC 13869 shall apply accordingly.

6.5.4 Actions at a Transferred-To PINX

The SDL representation of procedures at a Transferred-To PINX is shown in D.4 of annex D.

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6.5.4.1 Normal procedures

Having agreed the B-channel and sent back a SETUP ACKNOWLEDGE or a CALL PROCEEDING message in response to an incoming SETUP message, in accordance with the procedures of ISO/IEC 11572, if the SETUP contains a ssctSetup invoke APDU, the Transferred-To PINX shall proceed as follows. The Transferred-To PINX may record details of the transfer, may notify the transferred user, and may solicit a subaddress for sending to user B.

The call establishment shall proceed according to the procedures of ISO/IEC 11572.

6.5.4.2 Exceptional procedures

Not applicable.

6.5.5 Actions at a Transit PINX

No special actions are required in support of SS-SSCT.

6.5.6 Subsequent actions at Transferred and Transferred-To PINX

As the Transferred PINX acts in the same way as a SS-CT Primary PINX in case of SS-CT by join, and the Transferred-To PINX acts for the subsequent actions as a SS-CT Secondary PINX in case of SS-CT by join, sub-clause 6.5.5 of ISO/IEC 13869 shall apply accordingly.

6.6 SS-SSCT impact of interworking with public ISDNs

6.6.1 Actions at a Gateway PINX

As no similar service is available within a public ISDN, SS-SSCT has to be invoked by a PISN user A and also the Rerouting PINX has to be placed within the PISN.

Interworking aspects are different depending on the type of interworking situation, the two relevant types are:

- User B is in the public ISDN,
- User C is in the public ISDN,

these two scenarios can be combined, i.e. both users (B and C) can be within the public ISDN.

6.6.1.1 Impact of interworking if User B is in the public ISDN

Single Step Call Transfer is performed within the PISN and the Gateway PINX shall act as Transferred PINX.

If the signalling protocol at the access allows, the Gateway PINX shall indicate that transfer has occurred, together with relevant information e.g. transferringNumber, and the number and/or subaddress of the Transferred-to user in appropriate notifications or operations to the public ISDN.

If subaddress information is subsequently received from the public ISDN it shall be forwarded to the Transferred-To PINX as data element connectedSubaddress in a subaddressTransfer invoke APDU within a FACILITY message. For this scenario only complete numbers are allowed.

6.6.1.2 Impact of interworking if User C is in the public ISDN

Single Step Call Transfer is performed within the PISN and the Gateway PINX shall act as Transferred-To PINX.

If the signalling protocol at the access allows, the Gateway PINX shall indicate that transfer has occurred, together with relevant information e.g. transferringNumber, and the number and/or subaddress of the transferred user in appropriate notifications or operations to the public ISDN.

If subaddress information is subsequently received from the public ISDN it shall be forwarded to the Transferred PINX as data element connectedSubaddress in a subaddressTransfer invoke APDU within a FACILITY message.

6.7 SS-SSCT impact of interworking with non-ISDNs

6.7.1 Actions at a Gateway PINX

If no similar service is available within a non-ISDN, SS-SSCT has to be invoked by a PISN user A and also the Rerouting PINX has to be placed within the PISN.

When user A is in the PISN, and user B (user C) is in the non-ISDN, single step call transfer shall be performed within the PISN, and the gateway PINX shall act as Transferred (Transferred-To) PINX. For this scenario only complete numbers are allowed.

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The gateway shall perform for single step call transfer a signalling mapping between the signalling system specified in this International Standard and that of the non-ISDN.

6.8 Protocol Interactions between SS-SSCT and other supplementary services and ANFs

This clause specifies protocol interactions with other supplementary services and ANFs for which stage 3 standards had been published at the time of publication of this International Standard. For interactions with supplementary services and ANFs for which stage 3 standards are published subsequent to the publication of this International Standard, see those other stage 3 standards.

NOTE 3 - Simultaneous conveyance of APDUs for SS-SSCT and another supplementary service or ANF in the same message, each in accordance with the requirements of its respective stage 3 standard, does not, on its own, constitute a protocol interaction.

NOTE 4 - Additional interactions that have no impact on the signalling protocol at the Q reference point can be found in the relevant stage 1 specifications.

6.8.1 Calling Name Identification Presentation (SS-CNIP)

Protocol interactions are specified in 6.5.

6.8.2 Connected Name Identification Presentation (SS-CONP)

Protocol interactions are specified in 6.5.

NOTE 5 - For details see also ISO/IEC 13869.

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

No protocol interaction.

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

No protocol interaction.

6.8.5 CallForwarding Unconditional (SS-CFU)

6.8.5.1 Actions at a Rerouting PINX and SS-CFU Originating PINX

In state SSCT-Await-Setup-Response-Alert or SSCT-Await-Setup-Response-Connect the Rerouting PINX shall convey any received divertingLegInformation1 invoke APDU or divertingLegInformation3 invoke APDU from the Transferred-To PINX together with the callTransferComplete invoke APDU to the Transferred PINX.

In state SSCT-Idle the Rerouting PINX shall pass any received divertingLegInformation1 invoke APDU or divertingLegInformation3 invoke APDU from the Transferred-To PINX to the Transferred PINX.

6.8.5.2 Actions at a Rerouting PINX and a SS-CFU Rerouting PINX

In state SSCT-Await-Setup-Response-Alert or SSCT-Await-Setup-Response-Connect, on receipt of a callRerouting invoke APDU from the Transferred-To PINX, the Rerouting PINX shall act as the SS-CFU Rerouting PINX. Any divertingLegInformation1 invoke APDUs or divertingLegInformation3 invoke APDUs generated in accordance with SS-CFU Rerouteing PINX procedures shall be stored in the Rerouting PINX and sent together with the callTransferComplete invoke APDU to the Transferred PINX.

In state SSCT-Idle the Rerouting PINX shall pass any received divertingLegInformation1 invoke APDU or divertingLegInformation3 invoke APDU from the Transferred-To PINX to the Transferred PINX.

6.8.5.3 Actions at a Transferred-To PINX

The ssctSetup invoke APDU shall be forwarded with the new call to the SS-CFU Diverted-To PINX, which shall act as the new SS-SSCT Transferred-To PINX.

6.8.6 Call Forwarding Busy (SS-CFB)

6.8.6.1 Actions at a Rerouting PINX and SS-CFB Originating PINX

Protocol interactions as specified in 6.8.5.1, the term SS-CFU Rerouting PINX shall be replaced by SS-CFB Rerouting PINX.

6.8.6.2 Actions at a Rerouting PINX and a SS-CFB Rerouting PINX

Protocol interactions as specified in 6.8.5.2, the term SS-CFU Rerouting PINX shall be replaced by SS-CFB Rerouting PINX.

6.8.6.3 Actions at a Transferred-To PINX

Protocol interactions as specified in 6.8.5.3, the term SS-CFU Rerouting PINX shall be replaced by SS-CFB Rerouting PINX.

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6.8.7 Call Forwarding No Reply (SS-CFNR)

6.8.7.1 Actions at a Rerouting PINX and SS-CFNR Originating PINX

In state SSCT-Await-Setup-Response-Connect the Rerouting PINX shall convey any received divertingLegInformation1 invoke APDU or divertingLegInformation3 invoke APDU from the Transferred-To PINX to the Transferred PINX.

6.8.7.2 Actions at a Rerouting PINX and a SS-CFNR Rerouting PINX

In state SSCT-Await-Setup-Response-Connect, on receipt of a callRerouting invoke APDU from the Transferred-To PINX, the Rerouting PINX shall act as the SS-CFNR Rerouting PINX. Any divertingLegInformation1 invoke APDUs or divertingLegInformation3 invoke APDUs generated in accordance with SS-CFNR Rerouting PINX procedures shall be sent to the Transferred PINX.

6.8.7.3 Actions at a Transferred-To PINX

The ssctSetup invoke APDU shall be forwarded with the new call to the SS-CFNR Diverted-To PINX, which shall act as the new SS-SSCT Transferred-To PINX.

6.8.8 Call Deflection (SS-CD)

The protocol interactions with Call Deflection Immediate (SS-CDI) shall be as specified in 6.8.5. for interaction with SS-CFU.

The protocol interactions with Call Deflection from Alert (SS-CDA) shall be as specified in 6.8.7 for interaction with SS-CFNR.

6.8.9 Call Transfer (SS-CT)

A SS-CT request by the local user will be rejected by a SS-SSCT PINX when in any other SS-SSCT state than SSCT-Idle.

A SS-SSCT request by the local user will be rejected by a SS-CT PINX when in any other SS-CT state than CT-Idle.

6.8.9.1 Actions at a Transferring PINX and Rerouting PINX

While in any other SS-SSCT state than SSCT-Idle, any incoming callTransferIdentify or callTransferInitiate invoke APDU shall be answered with the according return error APDU, indicating supplementaryServiceInteractionNotAllowed by the Transferring PINX as well as by the Rerouting PINX.

6.8.9.2 Actions at a SS-CT Transferring PINX

If the SS-CT Transferring PINX had previously sent a callTransferComplete invoke APDU, an incoming ssctInitiate invoke APDU shall be answered with a return error APDU, indicating supplementaryServiceInteractionNotAllowed.

6.8.10 Path Replacement (ANF-PR)

ANF-PR may be invoked as a direct consequence of performing SS-SSCT.

The following protocol interaction shall apply for the SS-SSCT original call to the Transferring and the Transferred PINX.

6.8.10.1 Actions at a ANF-PR Requesting PINX

6.8.10.1.1 Invocation of Single Step Call Transfer

For the purpose of the requirements below, these events shall be considered as invocation SS-SSCT:

- receipt of ssctInitiate invoke APDU,
- invocation of SS-SSCT by the local user (SS-SSCT user A).

SS-SSCT shall be allowed to proceed normally if invoked while the PINX is acting as a Requesting PINX for ANF-PR. If SS-SSCT is invoked while in ANF-PR state PR-Req-Initiating or PR-Req-Rejecting, all signalling for SS-SSCT shall occur on the ANF-PR old path. If SS-SSCT is invoked while in ANF-PR state PR-Req-Completing, all subsequent signalling for SS-SSCT shall be sent on the ANF-PR new path and received SS-SSCT signals shall be accepted from either paths.

6.8.10.1.2 Initiation of ANF-PR during Single Step Call Transfer

ANF-PR shall not be initiated during SS-SSCT.

6.8.10.2 Actions at an ANF-PR Cooperating PINX

6.8.10.2.1 Invocation of Call Transfer

On receipt of a ssctInitiate invoke APDU while acting as an ANF-PR Cooperating PINX in ANF-PR state PR-Coop-Establishment or PR-Coop-Retain, SS-SSCT shall be allowed to proceed normally using the ANF-PR old path for further signalling.

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As an exceptional procedure, if after receipt of a ssctInitiate invoke APDU while acting as an ANF-PR Cooperating PINX in ANF-PR state PR-Coop-Establishment or PR-Coop-Retain, the old path is released as a result of successful ANF-PR before SS-SSCT signalling is complete, SS-SSCT shall be allowed to proceed normally using the ANF-PR new path for further signalling.

While acting as an ANF-PR Cooperating PINX in ANF-PR state PR-Coop-Establishment, an SS-SSCT invocation request from the local user shall be treated in one of the following ways:

- reject the request for SS-SSCT; or
- wait until ANF-PR is completed before processing the request for SS-SSCT; or
- abort ANF-PR and proceed with SS-SSCT.

To abort ANF-PR while in state PR-Coop-Establishment, the Cooperating PINX shall send a DISCONNECT message using the call reference of the new connection, thereby initiating the clearing procedures of ISO/IEC 11572 for the new connection, send a pathReplacePropose return error APDU with error value supplementaryServiceInteractionNotAllowed using the call reference of the old connection, and enter state PR-Coop-Idle.

While acting as an ANF-PR Cooperating PINX in ANF-PR state PR-Coop-Retain, an SS-SSCT invocation request from the local user shall be treated in one of the following ways:

- reject the request for SS-SSCT; or
- wait until ANF-PR is completed before processing the request for SS-SSCT.

6.8.10.2.2 Initiation of ANF-PR during Single Step Call Transfer

On receipt of a pathReplacePropose invoke APDU while acting as a SS-SSCT Transferring or SS-SSCT Transferred PINX during SS-SSCT, a pathReplacePropose return error APDU shall be sent. The error shall be temporarilyUnavailable.

6.8.11 Advice Of Charge (SS-AOC)

6.8.11.1 Actions at an SS-AOC Originating PINX

The following interactions apply when the Transferring PINX acts as SS-AOC Originating PINX.

6.8.11.1.1 Normal procedures

In state Aoc-Orig-Active, on a Single Step Call Transfer request, the SS-AOC Originating PINX shall delay SS-SSCT procedures, send an aocComplete invoke APDU in a FACILITY message to the Outgoing Gateway PINX, start SS-AOC timer T1 and enter state Aoc-Orig-Wait-Completion.

The number of user A shall be included in element chargedUser.

If charging association information is available, it shall be included in element chargingAssociation.

In state Aoc-Orig-Wait-Completion, on receipt of an aocComplete return result APDU in a FACILITY message coded aocFreeOfCharge, i.e. user A is not charged for the call before or after the single step call transfer, the SS-AOC Originating PINX shall stop SS-AOC timer T1, start the Single Step Call Transfer procedures as described in this International Standard and enter state Aoc-Orig-Idle.

NOTE 6 - The SS-AOC Originating PINX should send to user A the indication that the call is free of charge in accordance with the particular AOC supplementary services invoked.

In state Aoc-Orig-Wait-Completion, on receipt of an aocComplete return result APDU in a FACILITY message coded aocContinueCharging, i.e. user A continues to be charged, the SS-AOC Originating PINX shall stop SS-AOC timer T1, start the Single Step Call Transfer procedures as described in this International Standard and enter state Aoc-Orig-Idle.

NOTE 7 - In the case of AOC-D, the SS-AOC Originating PINX should send the subtotal charge to user A.

In state Aoc-Orig-Wait-Completion, on receipt of an aocComplete return result APDU in a FACILITY message coded aocStopCharging, i.e. user A is charged only for the call prior to transfer, the SS-AOC Originating PINX shall stop SS-AOC timer T1, start the Single Step Call Transfer procedures described in this International Standard and enter state Aoc-Orig-Idle.

In state Aoc-Orig-Idle, on receipt of an aocFinal invoke APDU in a SETUP message using the call reference of a call-independent signalling connection, the SS-AOC Originating PINX shall stay in state Aoc-Orig-Idle and clear the call-independent signalling connection.

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NOTE 8 - The final charging information received should be indicated to the user as identified by the content of the Called party number information element in the SETUP message. If element chargingAssociation is present in the invoke APDU, it should also be indicated to the user.

6.8.11.1.2 Exceptional procedures

In state Aoc-Orig-Wait-Completion, on expiry of SS-AOC timer T1, the SS-AOC Originating PINX shall start the Single Step Call Transfer procedures as described in this International Standard and enter state Aoc-Orig-Idle.

In state Aoc-Orig-Wait-Completion, on receipt of an aocComplete return error or reject APDU the SS-AOC Originating PINX shall stop SS-AOC timer T1, start the Single Step Call Transfer procedures as described in this International Standard and enter state Aoc-Orig-Idle.

In state Aoc-Orig-Wait-Completion, on receipt of a call clearing message relating to the original call to be transferred, the SS-AOC Originating PINX shall allow the clearing of that call.

6.8.11.2 Actions at the Transferred PINX

In state Aoc-Orig-Idle, after receipt of a callTransferComplete invoke APDU the Transferred PINX may act as an SS-AOC Originating PINX for SS-AOC in accordance with the procedures of clause 6.6.1 in ISO/IEC 15050, using the procedures of clause 6.6.1.1.2 in ISO/IEC 15050 to invoke SS-AOC.

6.8.12 Call Offer (SS-CO)

No protocol interaction.

6.8.13 Do Not Disturb (SS-DND)

No protocol interaction.

6.8.14 Do Not Disturb Override (SS-DNDO)

No protocol interaction.

6.8.15 Recall (SS-RE)

No protocol interaction.

6.8.16 Call Intrusion (SS-CI)

No protocol interaction.

6.8.17 Call Interception (ANF-CINT)

If interception delayed is invoked for an unanswered, transferred call (waiting on busy or alerting), the Rerouting PINX can act as the Intercepting PINX.

6.8.17.1 Actions at a Rerouting PINX and ANF-CINT Originating PINX

In state SSCT-Await-Setup-Response-Alert or SSCT-Await-Setup-Response-Connect the Rerouting PINX shall not pass on any received cintLegInformation1, divertingLegInformation3, cintEnable or cintDisable invoke APDUs from the Transferred-To PINX.

In state SSCT-Idle if interception is invoked for the new call, the Rerouting PINX shall convey any received cintLegInformation1, divertingLegInformation3, cintEnable or cintDisable invoke APDUs from the Transferred-To PINX to the Transferred PINX.

6.8.17.2 Actions at a Transferred PINX

The actions at an Originating PINX specified in clause 6.6.3 of ISO/IEC 15054 for receipt of a cintLegInformation1, divertingLegInformation3, cintEnable or cintDisable invoke APDU and for invocation of interception delayed shall apply also to a Transferred PINX that has received a callTransferComplete invoke APDU with element call Status having the value “alerting” and has not received a callTransferActive invoke APDU. If interception delayed is invoked the procedures of clause 6.6.5 of ISO/IEC 15054 shall apply.

NOTE 9 - The basic call protocol control state in which the actions concerned apply is “active”.

6.8.18 Transit Counter (SS-TC)

When using Single Step Call Transfer the Rerouting PINX may include a Transit counter information element in the SETUP message sent to establish the new connection to the Transferred-To PINX. The transit count field of the Transit counter information element shall be set to zero.

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The Transferred-To PINX shall ignore the Transit counter information element if it is contained in the received SETUP message.

6.8.19 Route Restriction Class (ANF-RRC)

No protocol interaction.

6.8.20 Authentication of the PISN (SS-WTAN)

No protocol interaction.

6.8.21 Authentication of a WTM user (SS-WTAT)

No protocol interaction.

6.8.22 Wireless Terminal Location Registration (SS-WTLR)

No protocol interaction.

6.8.23 Wireless Terminal Mobility Incoming Call (ANF-WTMI)

No protocol interaction.

6.8.24 Wireless Terminal Mobility Outgoing Call (ANF-WTMO)

No protocol interaction.

6.8.25 Message Waiting Indication (SS-MWI)

No protocol interaction.

6.8.26 User Mobility Incoming Call (ANF-PUMI)

No protocol interaction.

6.8.27 User Mobility Outgoing Call (ANF-PUMO)

No protocol interaction.

6.8.28 Private User Mobility - Registration (SS-PUMR)

No protocol interaction.

6.8.29 Common Information (ANF-CMN)

No protocol interaction.

NOTE 10 - Common Information may be exchanged between Transferred PINX and Transferred-To PINX subsequent to single step call transfer. In this case the Transferred PINX is considered to be the ANF-CMN originating PINX and the Transferred-To PINX to be the ANF-CMN terminating PINX.

6.8.30 Call Priority Interruption (Protection) (SS-CPI(P))

6.8.30.1 Actions at the Transferring PINX

If the call to be transferred was established as a protected call, the Transferring PINX shall include a callProtectionRequest invoke APDU with the ssctInitiate invoke APDU in the FACILITY message sent to the Rerouting PINX. The argument to the callProtectionRequest invoke operation shall convey the higher of the CPIPL values of the original call.

6.8.30.2 Actions at the Rerouting PINX

If a callProtectionRequest invoke APDU is received together with the ssctInitiate invoke APDU from the Transferring PINX, SS-CPIP shall also be invoked for the establishment of the new connection.

If SS-CPIP was invoked for the original call it shall be invoked again with the current CPIPL value.

6.9 SS-SSCT Parameter values (Timers)

6.9.1 Timer T1

Timer T1 shall operate at the Transferring PINX during state SSCT-Await-Initiate-Response. Its purpose is to protect against the absence of a response to the ssctInitiate invoke APDU.

Timer T1 shall have a value not less than 50 seconds.

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6.9.2 Timer T2

Timer T2 may optionally operate at the Rerouting PINX during state SSCT-Await-Setup-Response-Connect. Its purpose is to protect against failure to establish the new connection.

NOTE 11 - Alternatively an implementation can rely on basic call timers for this protection.

Timer T2 shall have a value not less than 40 seconds.

6.9.3 Timer T3

Timer T3 shall operate at the Rerouting PINX during state SSCT-Await-Info. This timer is started on sending of the ssctPostDial invoke APDU, restarted on receipt of a ssctDigitInfo invoke APDU with incomplete number information, and stopped when a ssctDigitInfo invoke APDU containing final number information or an element sendingComplete is received.

On expiry of timer T3 the new call is either cleared or allowed to proceed, depending on the amount of digits received.

The value of timer T3 should be in the range 14 - 16 seconds.

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Annex A
(normative)

Protocol Implementation Conformance Statement (PICS) proforma

A.1 Introduction

The supplier of a protocol implementation which is claimed to conform to this International Standard shall complete the following Protocol Implementation Conformance Statement (PICS) proforma.

A completed PICS proforma is the PICS for the implementation in question. The PICS is a statement of which capabilities and options of the protocol have been implemented. The PICS can have a number of uses, including use:

- by the protocol implementor, as a check list to reduce the risk of failure to conform to the Standard through oversight;
- by the supplier and acquirer, or potential acquirer, of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the Standard's PICS proforma;
- by the user or potential user of an implementation, as a basis for initially checking the possibility of interworking with another implementation. While interworking can never be guaranteed, failure to interwork can often be predicted from incompatible PICSs;
- by a protocol tester, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

A.2 Instructions for completing the PICS proforma

A.2.1 General structure of the PICS proforma

The PICS proforma is a fixed format questionnaire divided into subclauses each containing a group of individual items. Each item is identified by an item number, the name of the item (question to be answered), and the reference(s) to the clause(s) that specifies (specify) the item in the main body of this International Standard.

The "Status" column indicates whether an item is applicable and if so whether support is mandatory or optional. The following terms are used:

m	mandatory (the capability is required for conformance to the protocol);
o	optional (the capability is not required for conformance to the protocol, but if the capability is implemented it is required for conformance to the protocol specifications);
o.<n>	optional, but support of at least one of the group of options labelled by the same numeral <n> is required;
x	prohibited;
c.<cond>	conditional requirement, depending on support for the item or items listed in condition <cond>;
<item>:m	simple conditional requirement, the capability being mandatory if item number <item> is supported, otherwise not applicable;
<item>:o	simple conditional requirement, the capability being optional if item number <item> is supported, otherwise not applicable;

Answers to the questionnaire items are to be provided either in the "Support" column, by simply marking an answer to indicate restricted choice (Yes) or (No), or in the "Not Applicable" column (N/A).

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A.2.2 Additional information

Items of Additional Information allow a supplier to provide further information intended to assist the interpretation of the PICS. It is not intended that a large quantity will be supplied, and a PICS can be considered complete without such information. Examples might be an outline of the ways in which a (single) implementation can be set up to operate in a variety of environments and configurations.

References to items of Additional information may be entered next to any answer in the questionnaire, and may be included in items of Exception information.

A.2.3 Exceptional information

It may occasionally happen that a supplier will wish to answer an item with mandatory or prohibited status (after any conditions have been applied) in a way that conflicts with the indicated requirement. No pre-printed answer will be found in the support column for this. Instead, the supplier is required to write into the support column an x.<i> reference to an item of Exception information, and to provide the appropriate rationale in the Exception item itself.

An implementation for which an Exception item is required in this way does not conform to this International Standard. A possible reason for the situation described above is that a defect in the Standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

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A.3 PICS proforma for SS-SSCT

A.3.1 Implementation identification

Supplier	
Contact point for queries about the PICS	
Implementation Name(s) and Version(s)	
Other information necessary for full identification, e.g. name(s) and version(s) for machines and/or operating systems; system name(s)	

Only the first three items are required for all implementations; other information may be completed as appropriate in meeting requirements for full identification.

The terms Name and Version should be interpreted appropriately to correspond with a suppliers terminology (e.g. Type, Series, Model).

A.3.2 Protocol summary

Protocol version	1.0
Addenda implemented (if applicable)	
Amendments implemented	
Have any exception items been required (see A.2.3)?	No [ ] Yes [ ] (The answer Yes means that the implementation does not conform to this International Standard)

Date of statement	

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A.3.3 General

Item	Question/feature	Reference	Status	N/A	Support
A1	Behaviour as a Transferring PINX		o.1		Yes [ ] No [ ]
A2	Behaviour as a Rerouting PINX		o.1		Yes [ ] No [ ]
A3	Behaviour as a Transferred PINX		o.1		Yes [ ] No [ ]
A4	Behaviour as a Transferred-To PINX		o.1		Yes [ ] No [ ]
A5	Behaviour as Gateway PINX to a public ISDN for SS-SSCT		o		Yes [ ] No [ ]
A6	Behaviour as Gateway PINX to a non-ISDN for SS-SSCT		o		Yes [ ] No [ ]

A.3.4 Procedures

Item	Question/feature	Reference	Status	N/A	Support
B1	Support of relevant ISO/IEC 11572 and ISO/IEC 11582 procedures	6.2	m		Yes [ ]
B2	Signalling procedures at a Transferring PINX	6.5.1	A1:m	[ ]	Yes [ ]
B3	Signalling procedures at a Rerouting PINX	6.5.2	A2:m	[ ]	Yes [ ]
B4	Signalling procedures at a Transferred PINX	6.5.3, 6.5.5	A3:m	[ ]	Yes [ ]
B5	Signalling procedures at a Transferred-To PINX	6.5.4, 6.5.5	A4:m	[ ]	Yes [ ]
B6	Interworking procedures to a public ISDN at a Transferred PINX	6.6.1.1	A5:o.2	[ ]	Yes [ ] No [ ]
B7	Interworking procedures to a public ISDN at a Transferred-To PINX	6.6.1.2	A5:o.2	[ ]	Yes [ ] No [ ]
B8	Interworking procedures to a non-ISDN at a Transferred PINX	6.7.1.1	A6:o.3	[ ]	Yes [ ] No [ ]
B9	Interworking procedures to a non-ISDN at a Transferred-To PINX	6.7.1.2	A6:o.3	[ ]	Yes [ ] No [ ]
B10	Transfer occurs on alerting new call	6.5.1.1	A1:o.4	[ ]	Yes [ ] No [ ]
B11	Transfer occurs on active new call	6.5.1.1	A1:o.4	[ ]	Yes [ ] No [ ]

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A.3.5 Coding

Item	Name of Item	Reference	Status	N/A	Support
C1	Sending of ssctInitiate invoke APDU and receipt of return result and return error APDUs	6.3	A1:m	[ ]	m: Yes [ ]
C2	Receipt of ssctInitiate invoke APDU and sending of return result and return error APDUs	6.3	A2:m	[ ]	m: Yes [ ]
C3	Sending of ssctSetup invoke APDU	6.3	A2:m	[ ]	m: Yes [ ]
C4	Receipt of ssctSetup invoke APDU	6.3	A4:m	[ ]	m: Yes [ ]
C5	Sending of ssctPostDial invoke APDU	6.3	A2:o	[ ]	o: Yes [ ] No [ ]
C6	Receipt of ssctPostDial invoke APDU	6.3	A3:m	[ ]	m: Yes [ ]
C7	Sending of ssctDigitInfo invoke APDU	6.3	A3:m	[ ]	m: Yes [ ]
C8	Receipt of ssctDigitInfo invoke APDU	6.3	A2:m	[ ]	m: Yes [ ]
C9	Sending of callTransferComplete invoke APDU	6.3	A2:m	[ ]	m: Yes [ ]
C10	Receipt of callTransferComplete invoke APDU	6.3	A3:m	[ ]	m: Yes [ ]
C11	Sending of callTransferActive invoke APDU	6.3	A2:m	[ ]	m: Yes [ ]
C12	Receipt of callTransferActive invoke APDU	6.3	A3:m	[ ]	m: Yes [ ]
C13	Sending of callTransferUpdate invoke APDU	6.3	c.1	[ ]	o: Yes [ ] No [ ]
C14	Receipt of callTransferUpdate invoke APDU	6.3	c.2	[ ]	m: Yes [ ]
C15	Sending of subaddressTransfer invoke APDU	6.3	c.1	[ ]	o: Yes [ ] No [ ]
C16	Receipt of subaddressTransfer invoke APDU	6.3	c.2	[ ]	m: Yes [ ]

c.1: If (A3 or A4) then optional, else N/A
c.2: If (A3 or A4) then mandatory, else N/A

A.3.6 Timers

Item	Question/feature	Reference	Status	N/A	Support
D1	Timer T1	6.9.1	A1:m	[ ]	m: Yes [ ] Value [...]
D2	Timer T2	6.9.2	A2:o	[ ]	o: Yes [ ] No [ ] Value [...]
D3	Timer T3	6.9.3	A2:m	[ ]	m: Yes [ ] Value [...]

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A.3.7 Interactions between SS-SSCT and SS-CFU / SS-CDI

Item	Question/feature	Reference	Status	N/A	Support
E1	Support of SS-CFU or SS-CDI by forward switching at an SS-SSCT Rerouting PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
E2	Support of SS-CFU or SS-CDI by rerouting at an SS-SSCT Rerouting PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
E3	Support of SS-CFU or SS-CDI at a Transferred-To PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
E4	Interactions at an SS-SSCT Rerouting PINX and an SS-CFU / SS-CDI Originating PINX	6.8.5.1	c.3	[ ]	m: Yes [ ]
E5	Interactions at an SS-SSCT Rerouting PINX and an SS-CFU / SS-CDI Rerouting PINX	6.8.5.2	c.4	[ ]	m: Yes [ ]
E6	Interactions at an SS-SSCT Transferred-To PINX	6.8.5.3	c.5	[ ]	m: Yes [ ]

c.3: If (A2 and E1) then m, else N/A
c.4: If (A2 and E2) then m, else N/A
c.5: If (A4 and E3) then m, else N/A

A.3.8 Interactions between SS-SSCT and SS-CFB

Item	Question/feature	Reference	Status	N/A	Support
F1	Support of SS-CFB by forward switching at an SS-SSCT Rerouting PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
F2	Support of SS-CFB by rerouting at an SS-SSCT Rerouting PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
F3	Support of SS-CFB at a Transferred-To PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
F4	Interactions at an SS-SSCT Rerouting PINX and an SS-CFB Originating PINX	6.8.6.1	c.6	[ ]	m: Yes [ ]
F5	Interactions at an SS-SSCT Rerouting PINX and an SS-CFB Rerouting PINX	6.8.6.2	c.7	[ ]	m: Yes [ ]
F6	Interactions at an SS-SSCT Transferred-To PINX	6.8.6.3	c.8	[ ]	m: Yes [ ]

c.6: If (A2 and F1) then m, else N/A
c.7: If (A2 and F2) then m, else N/A
c.8: If (A4 and F3) then m, else N/A

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A.3.9 Interactions between SS-SSCT and SS-CFNR / SS-CDA

Item	Question/feature	Reference	Status	N/A	Support
G1	Support of SS-CFNR or SS-CDA by forward switching at an SS-SSCT Rerouting PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
G2	Support of SS-CFNR or SS-CDA by rerouting at an SS-SSCT Rerouting PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
G3	Support of SS-CFNR or SS-CDA at a Transferred-To PINX	ISO/IEC 13873	o		Yes [ ] No [ ]
G4	Interactions at an SS-SSCT Rerouting PINX and an SS-CNR / SS-CDA Originating PINX	6.8.7.1	c.9	[ ]	m: Yes [ ]
G5	Interactions at an SS-SSCT Rerouting PINX and an SS-CCNR / SS-CDA Rerouting PINX	6.8.7.2	c.10	[ ]	m: Yes [ ]
G6	Interactions at an SS-SSCT Transferred-To PINX	6.8.7.3	c.11	[ ]	m: Yes [ ]

c.9: If (A2 and G1) then m, else N/A
c.10: If (A2 and G2) then m, else N/A
c.11: If (A4 and G3) then m, else N/A

A.3.10 Interactions between SS-SSCT and SS-CT

Item	Question/feature	Reference	Status	N/A	Support
H1	Support of SS-CT	ISO/IEC 13869	o		Yes [ ] No [ ]
H2	Interactions at a Transferring PINX and a Rerouting PINX	6.8.9.1	c.12	[ ]	m: Yes [ ]
H3	Interactions at a SS-CT Transferring PINX	6.8.9.2	c.13	[ ]	m: Yes [ ]

c.12: If (A1 or A2 and H1) then m, else N/A
c.13: If (A1 and H1) then m, else N/A

A.3.11 Interactions between SS-SSCT and ANF-PR

Item	Question/feature	Reference	Status	N/A	Support
I1	Support of ANF-PR at a ANF-PR Requesting PINX	ISO/IEC 13874	o		Yes [ ] No [ ]
I2	Support of ANF-PR at a ANF-PR Cooperating PINX	ISO/IEC 13874	o		Yes [ ] No [ ]
I3	Interactions at an ANF-PR Requesting PINX	6.8.10.1	I1:m	[ ]	m: Yes [ ] No [ ]
I4	Interactions at an ANF-PR Cooperating PINX	6.8.10.2	I2:m	[ ]	m: Yes [ ] No [ ]

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A.3.12 Interactions between SS-SSCT and SS-AOC

Item	Question/feature	Reference	Status	N/A	Support
J1	Support of SS-AOC in an SS-AOC Originating PINX	ISO/IEC 15050	o		Yes [ ] No [ ]
J2	Support of SS-AOC in Transferred PINX	ISO/IEC 15050	o		Yes [ ] No [ ]
J3	Interactions at an SS-AOC Originating PINX	6.8.11.1	J1:m	[ ]	m: Yes [ ] No [ ]
J4	Interactions at a Transferred PINX	6.8.11.2	c.14	[ ]	m: Yes [ ]

c.14: If (A3 and J2) then m, else N/A

A.3.13 Interactions between SS-SSCT and ANF-CINT

Item	Question/feature	Reference	Status	N/A	Support
K1	Support of ANF-CINT	ISO/IEC 15054	o		Yes [ ] No [ ]
K2	Interactions at a Rerouting PINX and an ANF-CINT Originating PINX	6.8.17.1	c.15	[ ]	m: Yes [ ]
K3	Interactions at a Transferred PINX	6.8.17.2	c.16	[ ]	m: Yes [ ]

c.15 If (A2 and K1) then m, else N/A
c.16: If (A3 and K1) then m, else N/A

A.3.14 Interactions between SS-SSCT and ANF-TC

Item	Question/feature	Reference	Status	N/A	Support
L1	Support of ANF-TC	ISO/IEC 15056	o		Yes [ ] No [ ]
L2	Interactions with ANF-TC	6.8.18	L1:m	[ ]	m: Yes [ ]

A.3.15 Interactions between SS-SSCT and SS-CPI(P)

Item	Question/feature	Reference	Status	N/A	Support
M1	Support of SS-CPIP	ISO/IEC 15992	o		Yes [ ] No [ ]
M2	Interactions at a Transferring PINX	6.8.29.1	c.17	[ ]	m: Yes [ ]
M3	Interactions at a Rerouting PINX	6.8.29.2	c.18	[ ]	m: Yes [ ]

c.17: If (A1 and M1) then m, else N/A.
c.18: If (A2 and M1) then m, else N/A.

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Annex B
(informative)

Imported ASN.1 definitions

The content of this annex has been deleted to remove duplicate ASN.1 definitions defined elsewhere.

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Annex C
(informative)

Examples of message sequences

This annex describes some typical message flows for SS-SSCT. The following conventions are used in the figures of this annex:

1 The following notation is used:


Message transporting SS-SSCT specific operation


Message without SS-SSCT specific operation

xxx.inv	Invoke APDU for operation xxx
xxx.rr	Return result APDU for operation xxx
xxx.re	Return error APDU for operation xxx

2 The figures show messages exchanged via Protocol Control between PINXs involved in SS-SSCT. Only messages relevant to SS-SSCT are shown.

3 Only the relevant information content (i.e. remote operation APDUs) is listed below each message name. The Facility information elements containing remote operation APDUs are not explicitly shown. Information with no impact on SS-SSCT is not shown.

4 The following abbreviations are used:

ctActive	callTransferActive
ctComplete	callTransferComplete
ctUpdate	callTransferUpdate

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C.1 Example message sequence for normal operation of single step call transfer, transfer occurs on alerting new call

Figure C.1 shows an example of a normal operation of single step call transfer when transfer occurs on alerting new call.

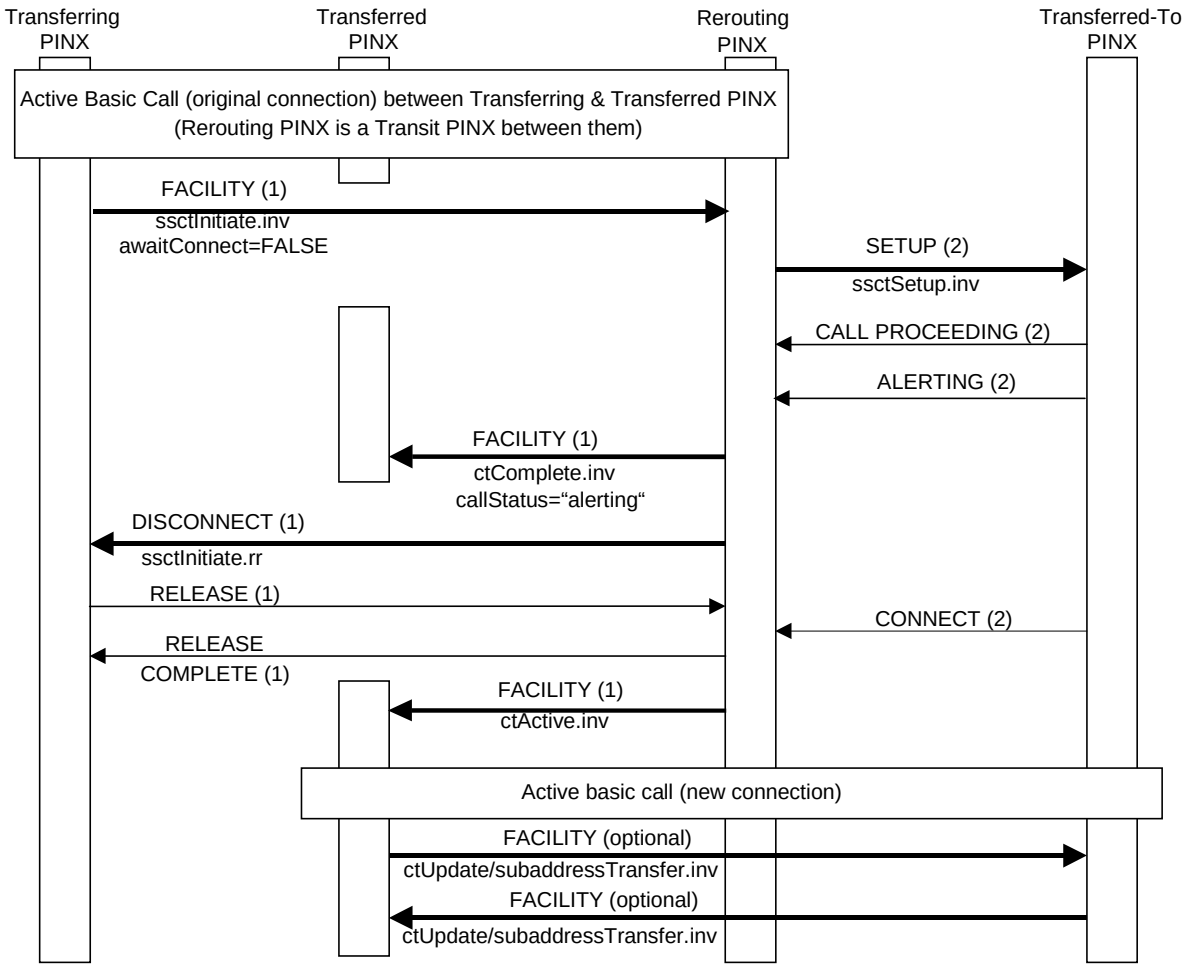

Figure C.1 - Message sequence for normal operation of single step call transfer, transfer occurs on alerting new call

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C.2 Example message sequence for normal operation of single step call transfer, transfer occurs on active new call

Figure C.2 shows an example of a normal operation of single step call transfer when transfer occurs on active new call.

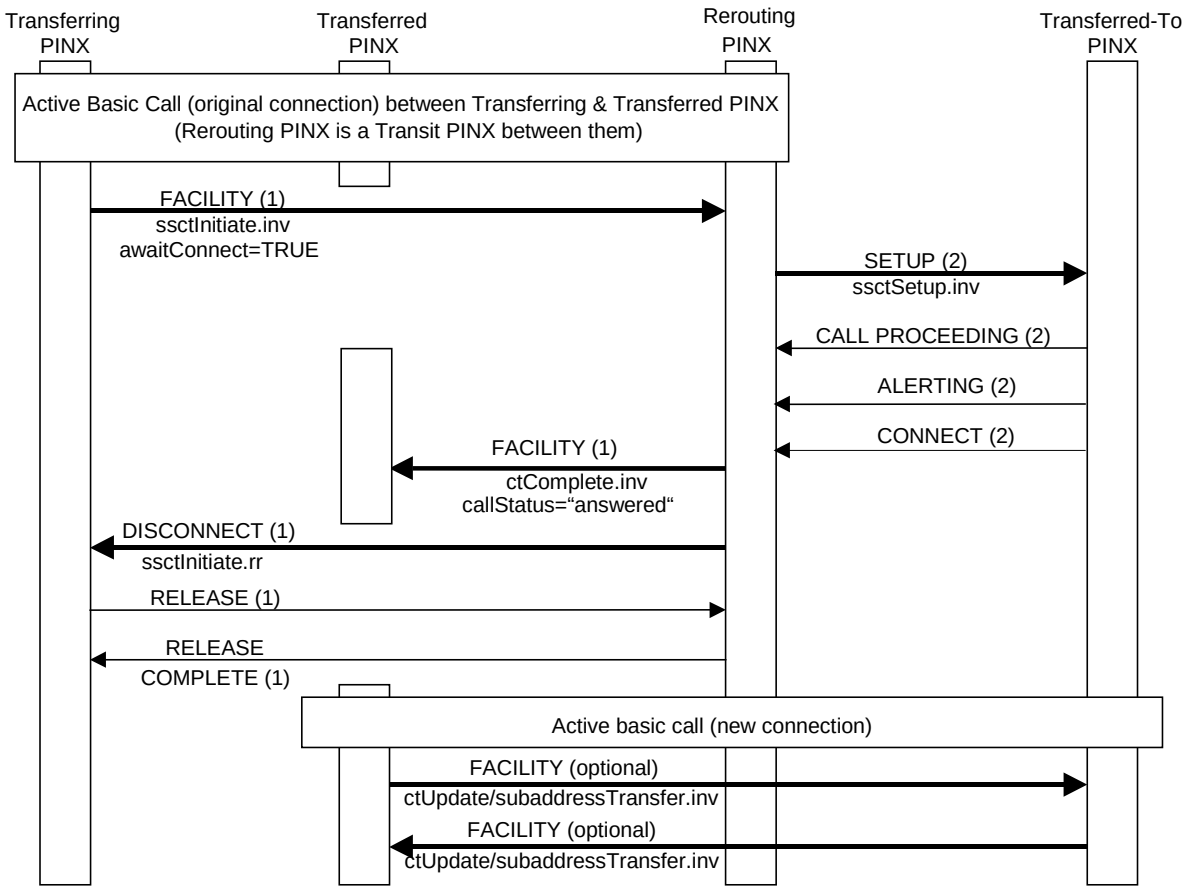

Figure C.2 - Message sequence for normal operation of single step call transfer, transfer occurs on active new call

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C.3 Example message sequence for normal operation of single step call transfer, transfer occurs after the transferred-to number is complete

Figure C.3 shows an example of a normal operation of single step call transfer when post dialing is required to establish the new call and the destination number is sent in pieces.

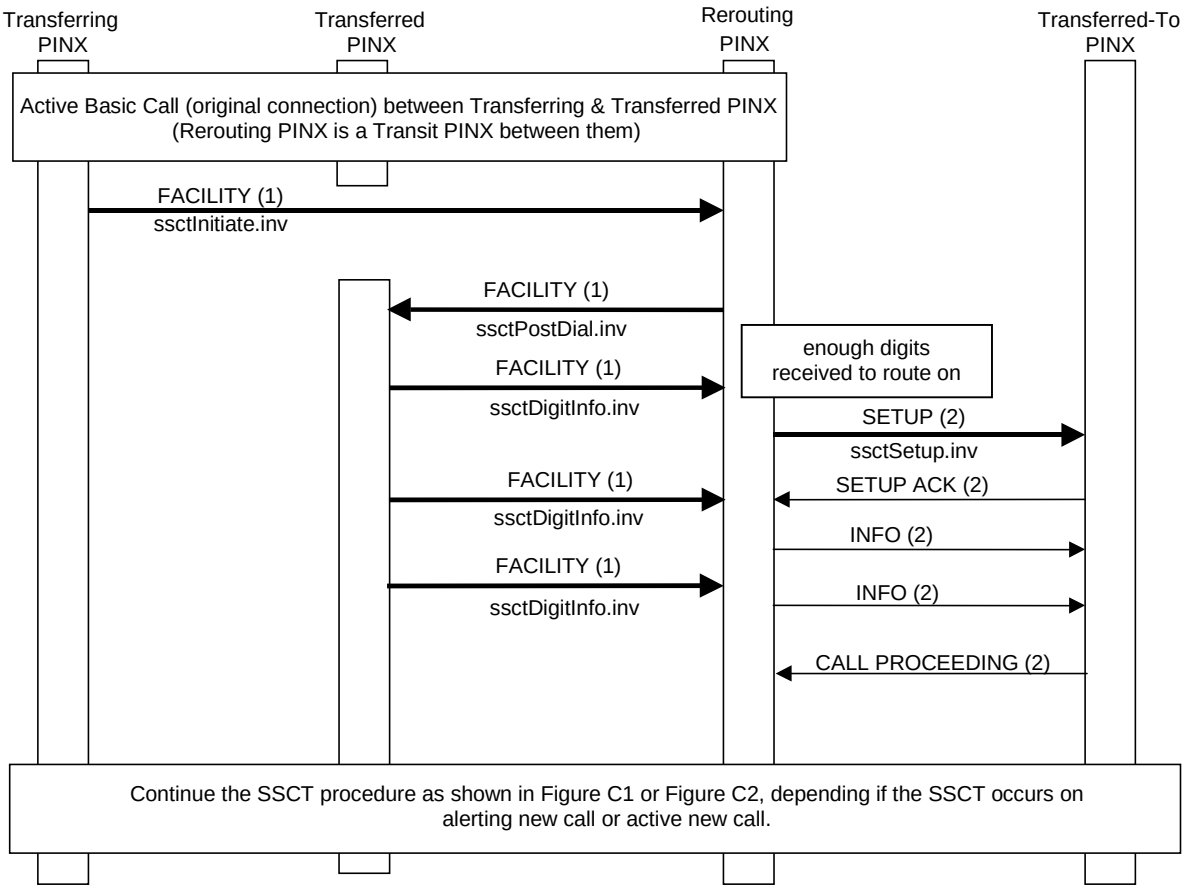

Figure C.3 - Message sequence for normal operation of single step call transfer, transfer occurs after the transferred-to number is complete

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C.4 Example message sequence for unsuccessful operation of single step call transfer, new call fails

Figure C.4 shows an example of a unsuccessful operation of single step call transfer when the new call fails.

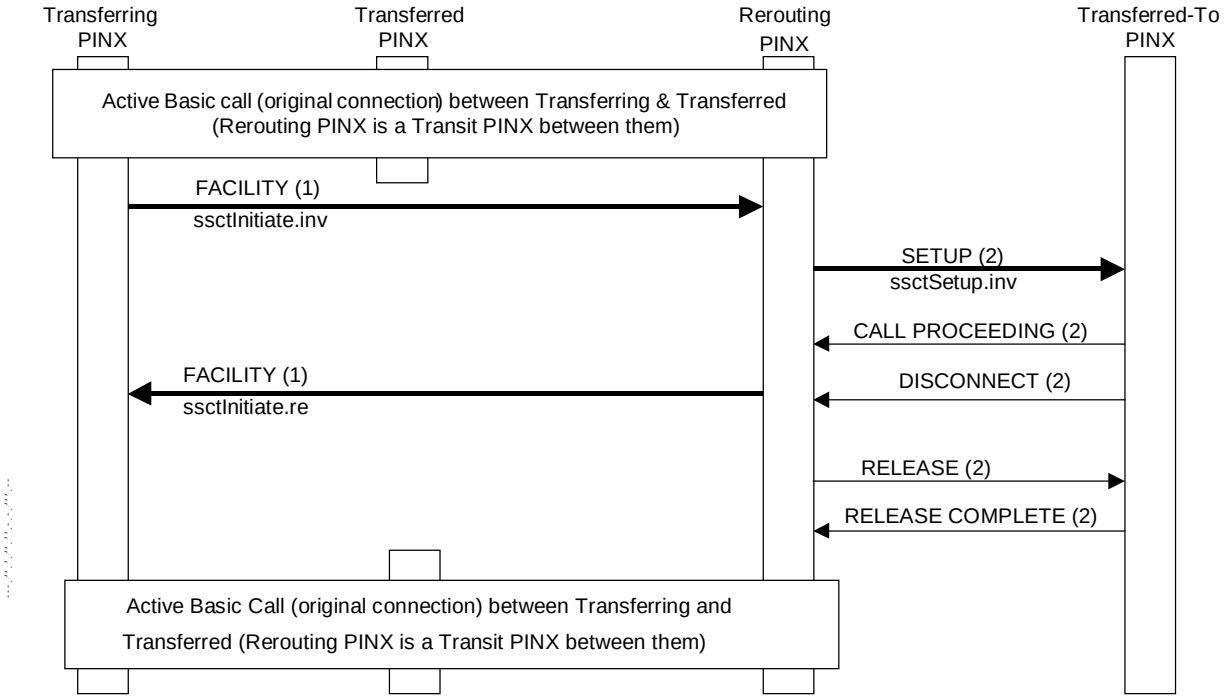

Figure C.4 - Message Sequence for unsuccessful operation of single step call transfer, new call fails

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Annex D
(informative)

Specification and Description Language (SDL) representation of procedures

The diagrams in this annex use the Specification and Description Language defined in ITU-T Rec. Z.100.

Each diagram represents the behaviour of a SS-SSCT Supplementary Service Control entity at a particular type of PINX. In accordance with the protocol model described in ISO/IEC 11582, the Supplementary Service Control entity uses, via the Coordination Function, the services of Generic Functional Transport Control and Basic Call Control.

Where an output symbol represents a primitive to the Coordination Function, and that primitive results in a PSS1 message being sent, the output symbol bears the name of the message and any remote operation APDU(s) contained in that message. In case of a message specified in ISO/IEC 11572, basic call actions associated with the sending of that message are deemed to occur.

Where an input symbol represents a primitive from the Coordination Function, and that primitive results from a PSS1 message being received, the input symbol bears the name of the message and any remote operation APDU(s) contained in that message. In case of a message specified in ISO/IEC 11572, basic call actions associated with the receiving of that message are deemed to occur.

The following abbreviations are used:

err.	return error APDU
ind.	indication
inv.	invoke APDU
new	new call
ori	original call
opt.	optionally
rej.	reject APDU
res.	return result APDU
aC	awaitConnect element

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D.1 SDL Representation of SS-SSCT at a Transferring PINX

Figure D.1 shows the behaviour of a SS-SSCT Supplementary Service Control entity within a Transferring PINX.

Input signals from the right and output signals to the right represent primitives to and from the Coordination Function in respect of the messages being sent and received to an from the Rerouting PINX.

Input signals from the left and output signals to the left represent stimuli between the SS-SSCT Supplementary Service Control entity and user A.

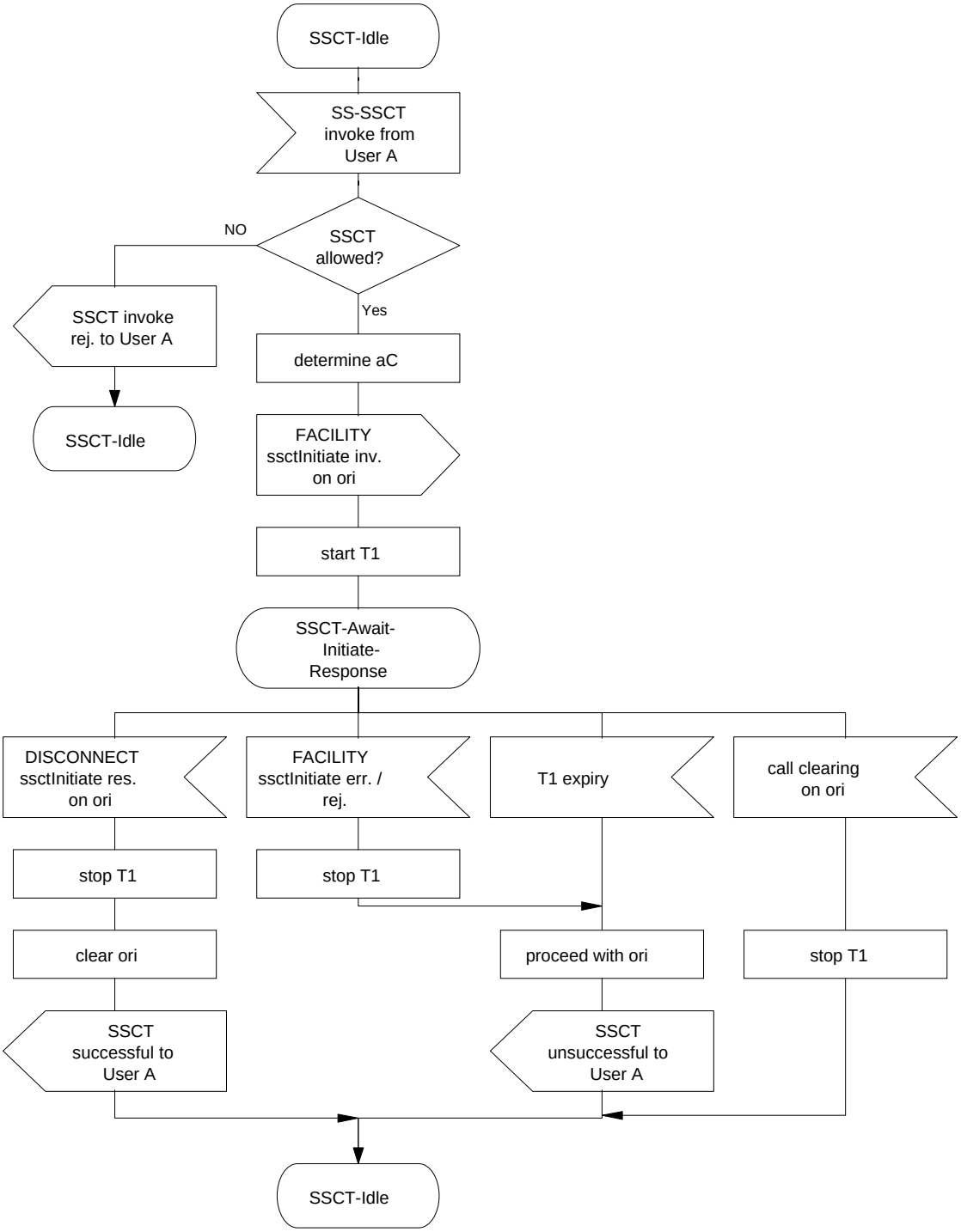

Figure D.1 - Transferring PINX SDL

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D.2 SDL Representation of SS-SSCT at a Rerouting PINX

Figure D.2 shows the behaviour of a SS-SSCT Supplementary Service Control entity within a Rerouting PINX.

Input signals from the right and output signals to the right represent primitives to and from the Coordination Function in respect of the messages being sent and received to and from the Transferred PINX, the Transferring PINX and the Transferred-To PINX.

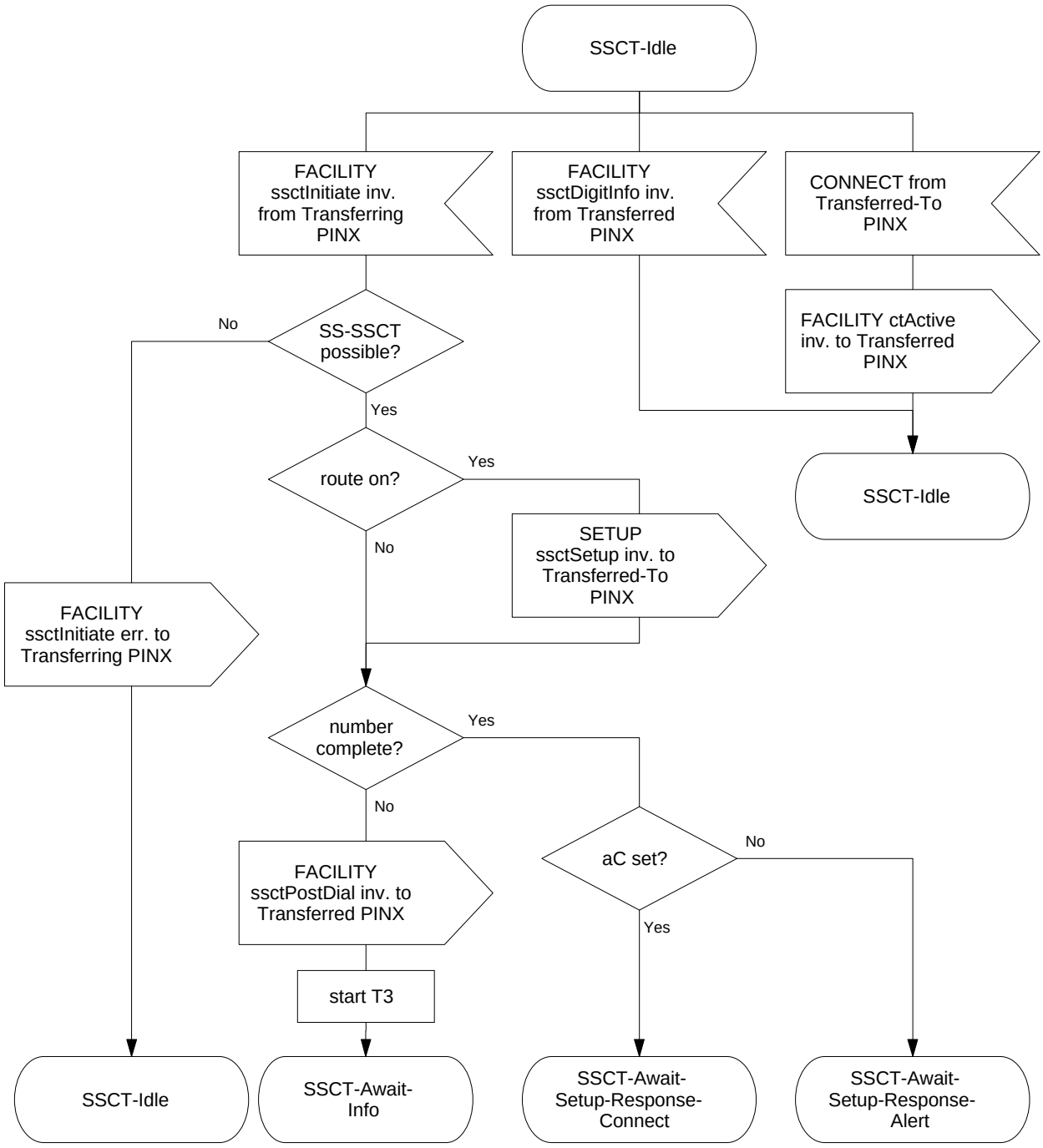

Figure D.2 (sheet 1 of 5) - Rerouting PINX SDL

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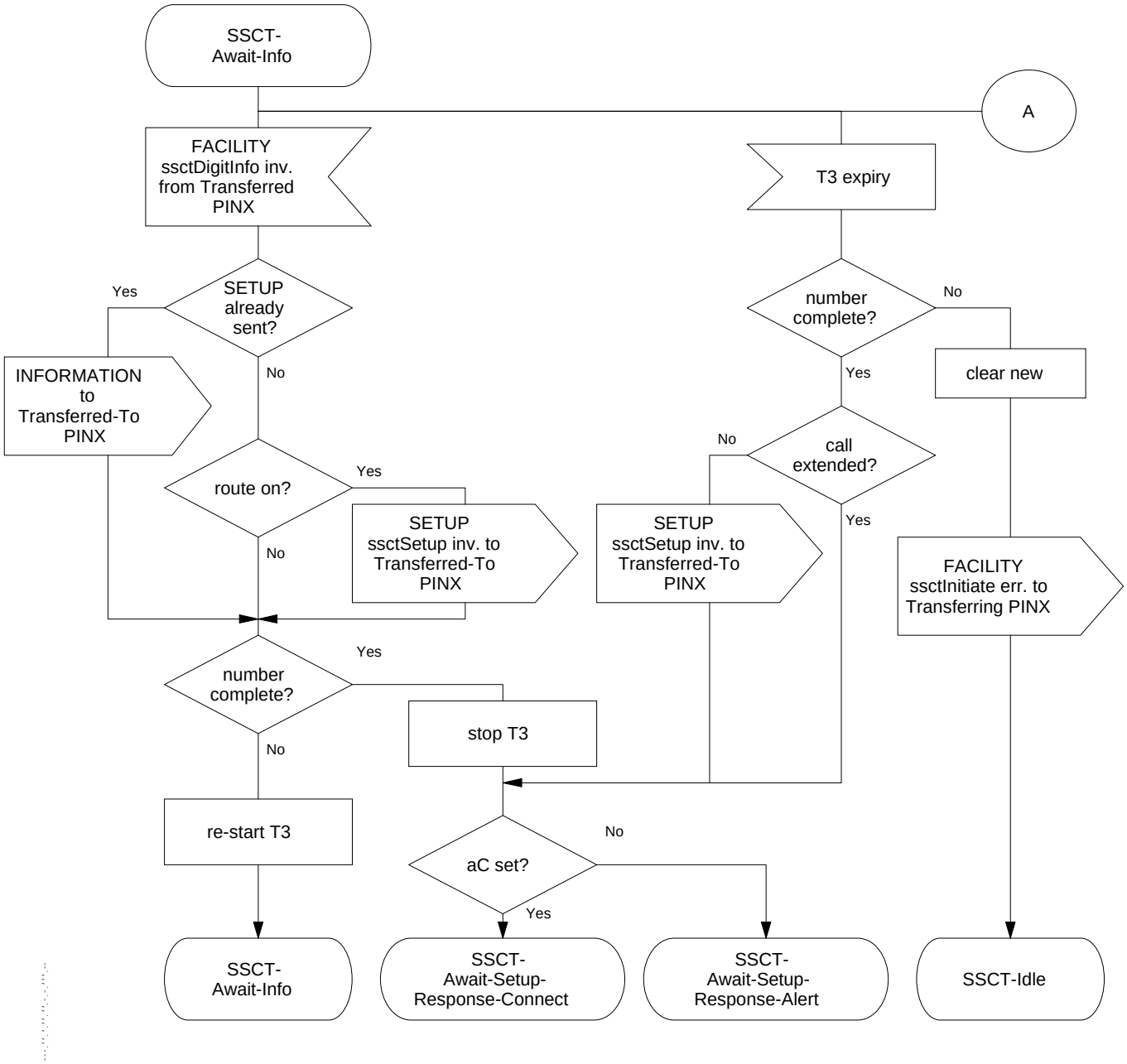

Figure D.2 (sheet 2 of 5) - Rerouting PINX SDL

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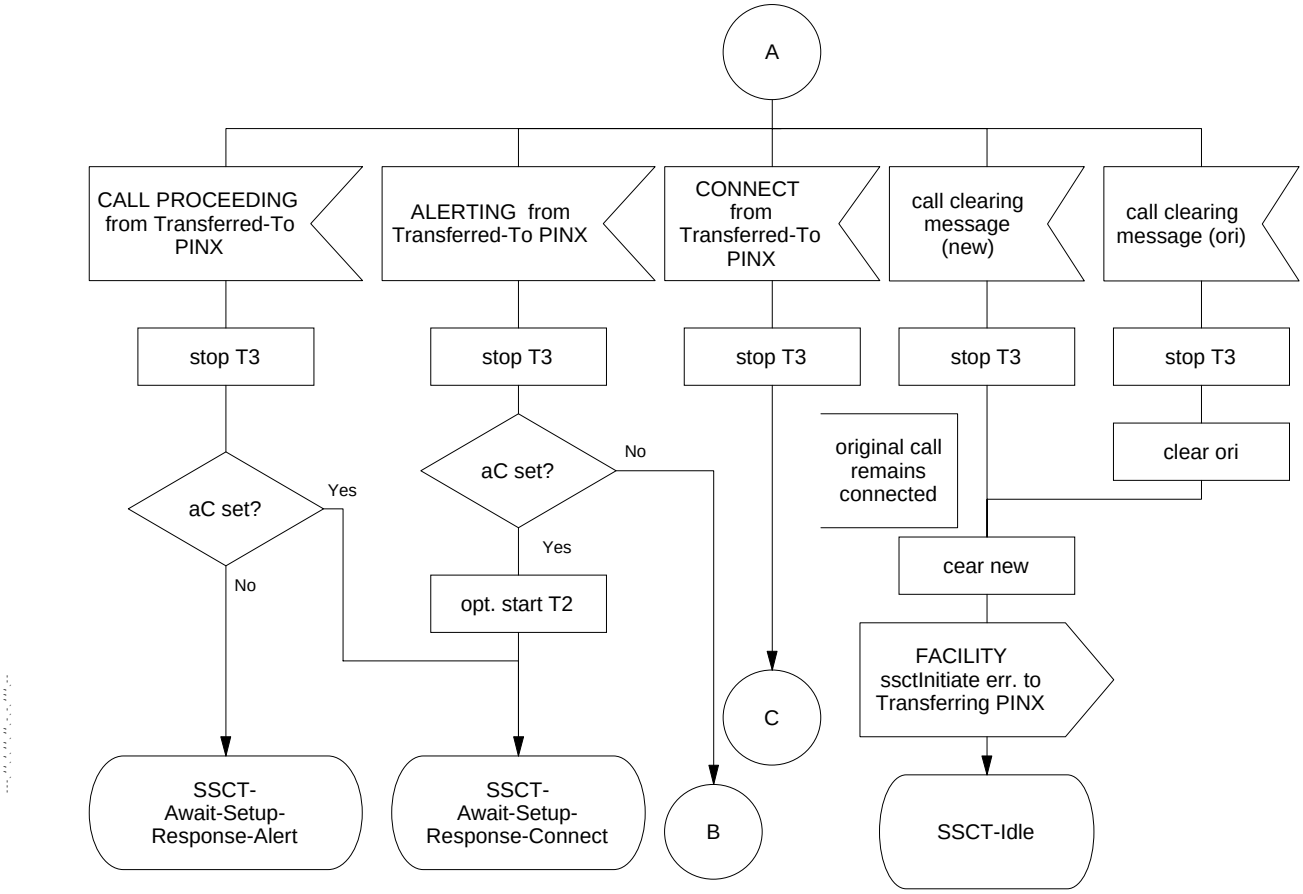

Figure D.2 (sheet 3 of 5) - Rerouting PINX SDL

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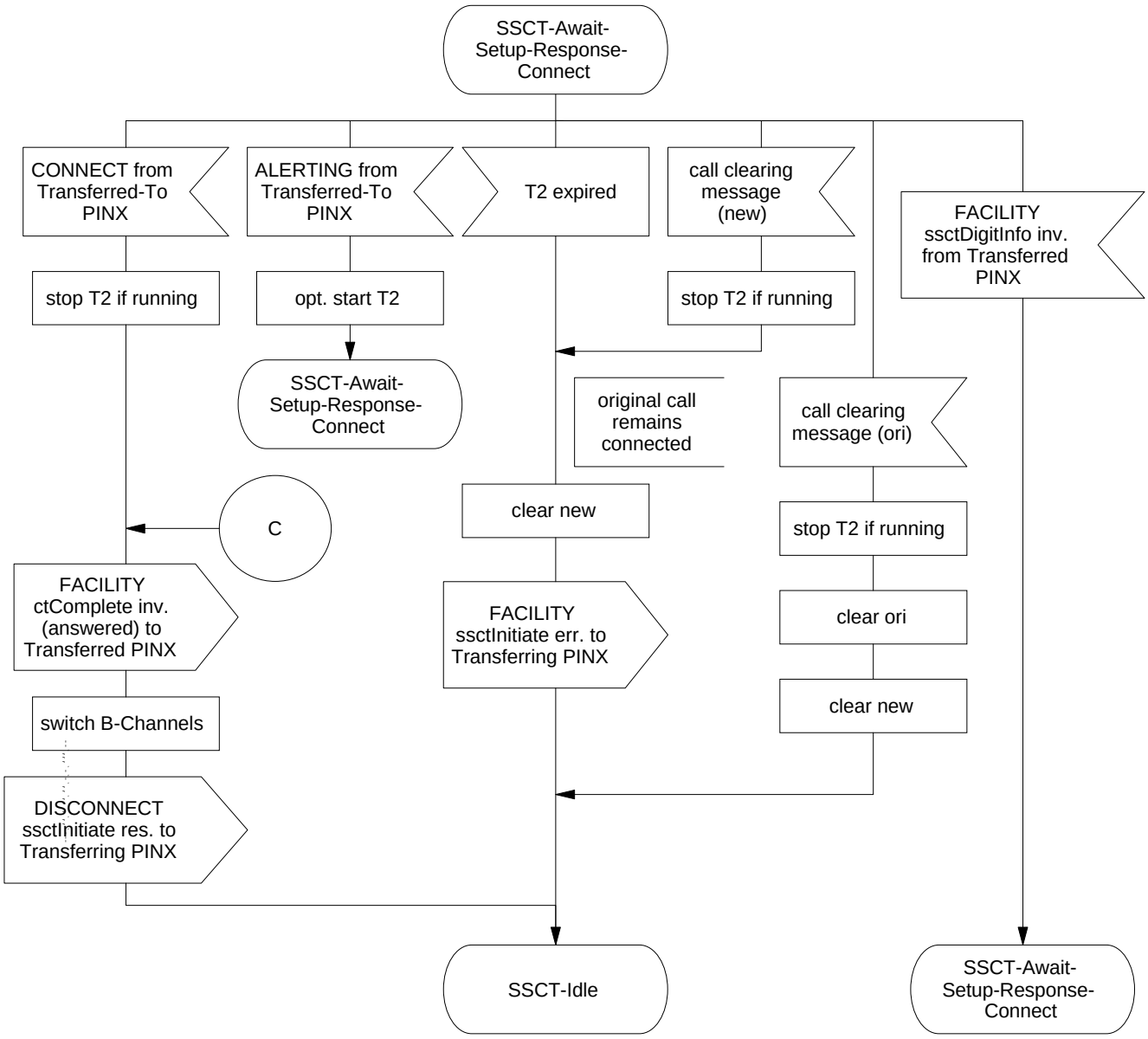

Figure D.2 (sheet 4 of 5) - Rerouting PINX SDL

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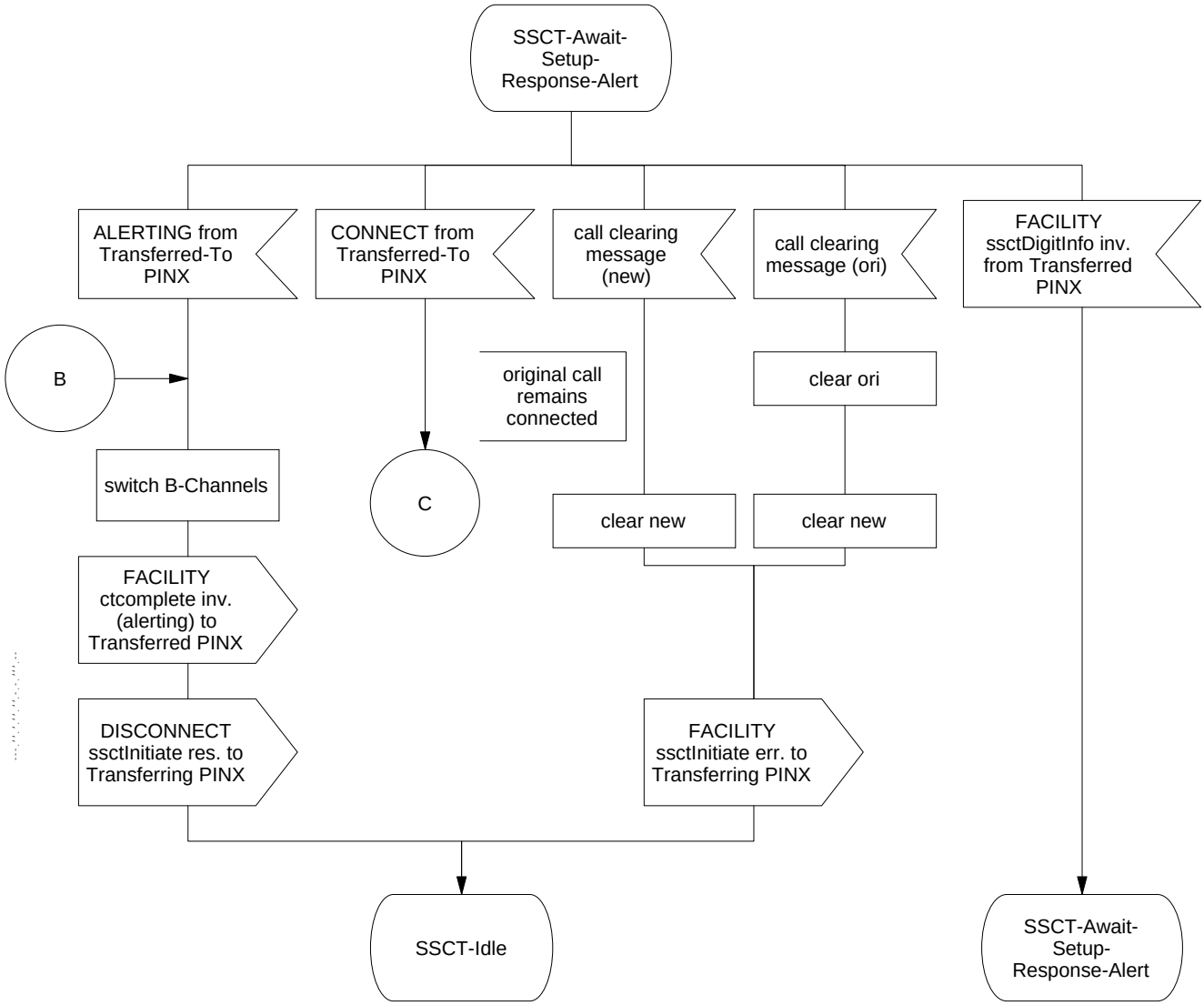

Figure D.2 (sheet 5 of 5) - Rerouting PINX SDL

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D.3 SDL Representation of SS-SSCT at a Transferred PINX

Figure D.3 shows the behaviour of a SS-SSCT Supplementary Service Control entity within a Transferred PINX.

Input signals from the right and output signals to the right represent primitives to and from the Coordination Function in respect of the messages being sent and received to and from the Rerouting PINX.

Input signals from the left and output signals to the left represent stimuli between the SS-SSCT Supplementary Service Control entity and the Transferred user B.

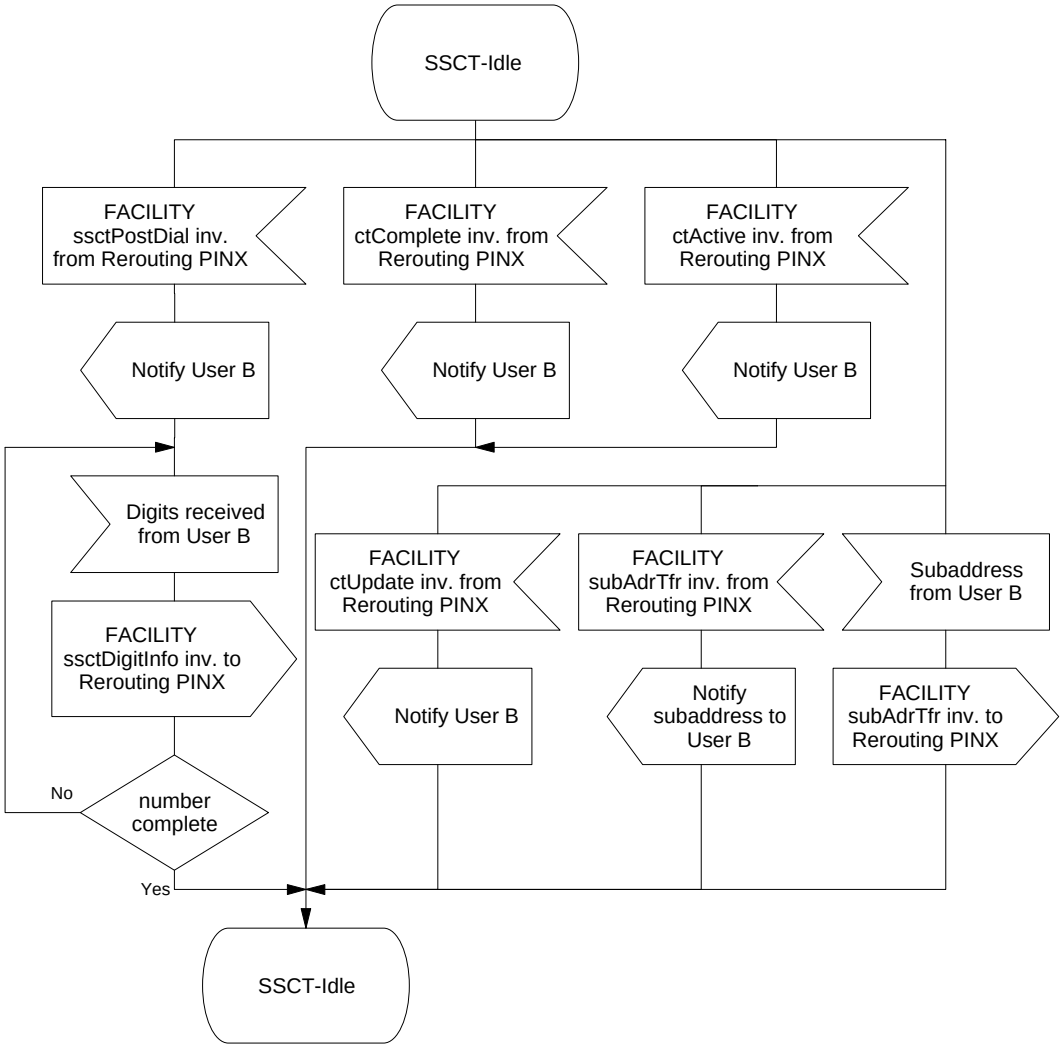

Figure D.3 - Transferred PINX SDL

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D.4 SDL Representation of SS-SSCT at a Transferred-To PINX

Figure D.4 shows the behaviour of a SS-SSCT Supplementary Service Control entity within a Transferred-To PINX.

Input signals from the right and output signals to the right represent primitives to and from the Coordination Function in respect of messages sent and received.

Input signals from the left and output signals to the left represent stimuli between the SS-SSCT Supplementary Service Control entity and the Transferred-to user C.

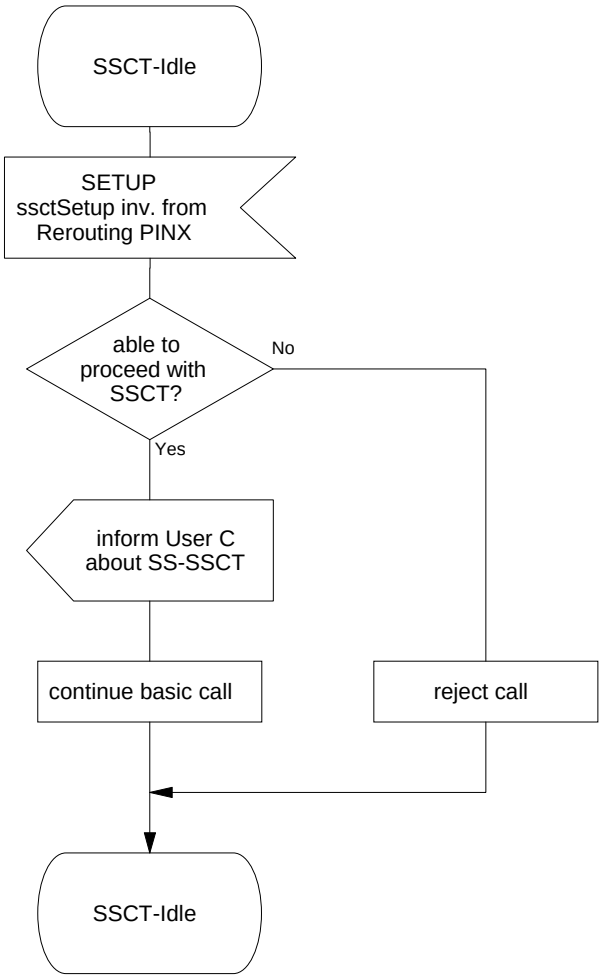

Figure D.4 - Transferred-To PINX SDL

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Annex E
(normative)

Additional feature identifier in module Common-Information-Operations

In ASN.1 module Common-Information-Operations {iso (1) standard (0) pss1-common-information (15772) operations (0)}, specified in 6.3.1 of ISO/IEC 15772, bit number 17 of type **FeatureIdList** shall be interpreted in the following way:

```
ssSSCTreRoutingSupported        (17)    -- Single Step Call Transfer rerouting supported
                                        -- meaningful both in forward and backward
                                        -- direction during call establishment
```


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Annex F
(informative)

Difference between Single Step Call Transfer and Call Transfer by Rerouting

The Single Step Call Transfer supplementary service is a service which enables a transferring user to replace an existing call with a transferred user by a new call between transferred user and transferred-to user whereby the transferring user does not have a call established with the transferred-to user prior to that single step call transfer. The PINX (Rerouting PINX) which reroutes the transferred user to the transferred-to user may be any PINX in the call path between the Transferring PINX and the Transferred PINX. In many cases the Rerouting PINX will be the Transferred PINX or, if this is not possible, a Transit PINX "near" the Transferred PINX.

The Call Transfer by Rerouting supplementary service (ISO/IEC 13869) is a service which enables a transferring user to transform two of that users calls into a new call between the transferred user and the transferred-to user. The PINX which reroutes the transferred user to the transferred-to user is prescribed to be the Primary PINX (i.e. the Transferred PINX) which is the PINX nearest to the transferred user.

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Annex G
(normative)

ASN.1 definitions according to ITU-T Recs. X.208 / X.209

This annex lists all ASN.1 modules as they were defined in the first edition of ISO/IEC 19460, i.e. based on ITU-T Recommendations X.208 / X.209. Starting with this edition the ASN.1 modules within ISO/IEC 19460 comply with ITU-T Recommendations X.680 / X.690. Please note that regardless of which version of these modules is used as a base of a QSIG implementation, the line encoding remains unchanged. Changes in future editions to modules based on X.680 / X.690 ASN.1 are not reflected in the modules in this annex.

Table G.1 - Single-Step-Call-Transfer-Operations – based on ITU-T Recs. X.208 / X.209

```
Single-Step-Call-Transfer-Operations
   { iso(1) standard (0) pss1-single-step-call-transfer (19460) single-step-call-transfer-operations (0)}

DEFINITIONS EXPLICIT TAGS ::=

BEGIN
IMPORTS
                    OPERATION, ERROR FROM Remote-Operation-Notation
                          { joint-iso-ccitt (2) remote-operations (4) notation (0) }
                    Extension FROM Manufacturer-specific-extension-definition
                          { iso (1) standard (0) pss1-generic-procedures (11582) msi-definition (0) }
                    Name FROM Name-Operations
                          {iso(1)  standard(0) pss1-name (13868)  name-operations (0)}
                    supplementaryServiceInteractionNotAllowed, notAvailable, invalidCallState
                          FROM General-Error-List
                          { ccitt recommendation q 950 general-error-list (1) }
                    PresentedAddressScreened, PartyNumber FROM Addressing-Data-Elements
                          {iso(1) standard (0) pss1-generic-procedures (11582)
                          addressing-data-elements (9)}
                    PSS1InformationElement FROM PSS1-generic-parameters-definition
                          {iso(1) standard (0) pss1-generic-procedures (11582)
                          pss1-generic-parameters (6)}
                    callTransferUpdate, callTransferComplete, callTransferActive, subaddressTransfer,
                    invalidRerouteingNumber, establishmentFailure FROM Call-Transfer-Operations
                          {iso(1) standard (0) pss1-call-transfer (13869) call-transfer-operations(0)};

SsctInitiate        ::=   OPERATION
                          -- sent from the Transferring PINX to the Rerouting PINX
                          ARGUMENT      SSCTInitiateArg
                          RESULT        DummyRes
                          ERRORS        { notAvailable, invalidCallState, invalidRerouteingNumber,
                                          establishmentFailure, unspecified,
                                          supplementaryServiceInteractionNotAllowed }
```


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Table G.1 - Single-Step-Call-Transfer-Operations – based on ITU-T Recs. X.208 / X.209 (continued)

```
SsctSetup           ::=   OPERATION
                          -- sent from the Rerouting PINX to the Transferred-To PINX
                          ARGUMENT     SSCTSetupArg

SsctPostDial ::=          OPERATION
                          -- sent from the Rerouting PINX to the Transferred PINX
                          ARGUMENT     DummyArg

SsctDigitInfo ::=         OPERATION
                          -- sent from the Transferred PINX to the Rerouting PINX
                          ARGUMENT     SSCTDigitInfoArg

DummyArg            ::=   CHOICE {
                           null              NULL,
                           single            [1]    IMPLICIT Extension,
                           multiple          [2]    IMPLICIT SEQUENCE OF Extension }

DummyRes            ::=   CHOICE {
                           null              NULL,
                           single            [1]    IMPLICIT Extension,
                           multiple          [2]    IMPLICIT SEQUENCE OF Extension }

SSCTInitiateArg ::=  SEQUENCE {
                          rerouteingNumber      PartyNumber,     -- Transferred-To Number
                          transferredAddress    PresentedAddressScreened,
                          awaitConnect          AwaitConnect,
                          transferredName       [1] Name                                OPTIONAL,
                          transferringAddress   [2] PresentedAddressScreened            OPTIONAL,
                          transferringName      [3] Name                                OPTIONAL,
                          argumentExtension     CHOICE {
                                                 single          [4] IMPLICIT Extension,
                                                 multiple        [5] IMPLICIT SEQUENCE OF Extension
                                                       }                                 OPTIONAL
                                        }

AwaitConnect ::=          BOOLEAN
                          -- FALSE = release the original call upon ALERTING received
                          -- TRUE = release the original call upon CONNECT received

SSCTSetupArg ::=  SEQUENCE {
                          transferringAddress   [1] PresentedAddressScreened   OPTIONAL,
                          transferringName      [2] Name                       OPTIONAL,
                          argumentExtension     CHOICE {
                                                 single          [3] IMPLICIT Extension,
                                                 multiple        [4] IMPLICIT SEQUENCE OF Extension
                                                       }                        OPTIONAL
                                        }
```

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Table G.1 - Single-Step-Call-Transfer-Operations – based on ITU-T Recs. X.208 / X.209 (concluded)

```
SSCTDigitInfoArg ::=  SEQUENCE {
                        reroutingNumber[1] PartyNumber                  OPTIONAL,
                                           -- remaining digits of the Transferred-To Number
                        sendingComplete    [2] IMPLICIT NULL            OPTIONAL,
                        argumentExtension  CHOICE {
                                            single    [3] IMPLICIT Extension,
                                            multiple  [4] IMPLICIT SEQUENCE OF Extension
                                                      }                 OPTIONAL
                                       }


Unspecified ::=         ERROR PARAMETER Extension
unspecified             Unspecified                   :: = localValue 1008

ssctInitiate            SsctInitiate                  :: = localValue 99
ssctSetup               SsctSetup                     :: = localValue 100
ssctPostDial            SsctPostDial                  :: = localValue 101
ssctDigitInfo           SsctDigitInfo                 :: = localValue 102

END                -- of SSCT Operations
```


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