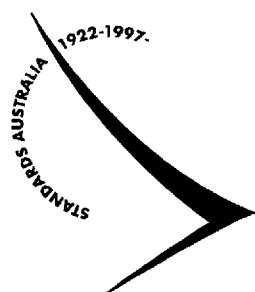


AS/NZS 4339:1997
ISO/IEC 13869:1995

Australian/New Zealand Standard[®]

**Information technology—
Telecommunications and
information exchange between
systems—Private integrated
services network—Inter-exchange
signalling protocol—Call transfer
supplementary service**



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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee IT/16, Private Telecommunications Networking. It was approved on behalf of the Council of Standards Australia on 10 March 1997 and on behalf of the Council of Standards New Zealand on 7 March 1997. It was published on 5 June 1997.

The following interests are represented on Committee IT/16:

Airline interests, New Zealand

AUSTEL

Australia Post

Australian Electrical and Electronic Manufacturers Association

Australian Telecommunications User Group

New Zealand Standards Committee SC605 WG1

N.S.W. Commercial Services Group

Optus Communications, Australia

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AS/NZS 4339:1997

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**Information technology—
Telecommunications and
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signalling protocol—Call transfer
supplementary service**

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT/16, Private Telecommunications Networking, to supersede AS/NZS 4339(Int):1995.

This Standard is identical with, and has been reproduced from, ISO/IEC 13869:1995, *Information technology—Telecommunications and information exchange between systems—Private Integrated Services Network—Inter-exchange signalling protocol—Call transfer supplementary service*.

The objective of this Standard is to provide private integrated services network (PISN) designers and users with the specification for the signalling protocol for use at the Q reference point between PISN exchanges, in order to support call transfer of two A party calls into a new call between parties B and C worldwide.

The Standard is one of a series of emerging ISO/IEC Standards applicable to private integrated services networking. The series uses the ISDN concepts as developed by ITU-T and is also within the framework of Standards for Open Systems Interconnection (OSI) as defined by ISO/IEC JTC 1.

Statements expressed in mandatory terms in notes to clauses are deemed to be requirements of this Standard.

Users of this Standard are advised by Standards Australia and Standards New Zealand, under arrangements made with ISO and IEC, as well as certain other Standards organizations, that the number of this Standard is not reproduced on each page; its identity is shown only on the cover, inside front cover and title pages.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

For the purpose of this Joint Standard, the ISO/IEC text should be modified as follows:

- (a) *Terminology* The words 'this Australian/New Zealand Standard' should replace the words 'this International Standard' wherever they appear.
- (b) *References* The references to international Standards should be replaced by references, where appropriate, to the following Australian/New Zealand Standards:

*Reference to International Standard
or other Publication*

Australian/New Zealand Standard

ISO/IEC

AS/NZS

11571 Information technology—
Telecommunications and information
exchange between systems—
Numbering and sub-addressing in
private integrated services networks

11572 Information technology—
Telecommunications and information
exchange between systems—
Private Integrated Services Network—
Circuit mode bearer services—
Inter-exchange signalling procedures
and protocol

4134 Information technology—
Telecommunications and information
exchange between systems—
Numbering and sub-addressing in
private integrated services networks

4137 Information technology—
Telecommunications and information
exchange between systems—
Private integrated services network—
Circuit mode bearer services—
Inter-exchange signalling procedures
and protocol

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ISO/IEC		AS/NZS	
11574	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	4135	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
11579	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network	4136	Information technology— Telecommunications and information exchange between systems— Private integrated services network
11579-1	Part 1: Reference configuration for PISN Exchanges (PINX)	4136.1	Part 1: Reference configuration for PISN exchanges (PINX)
11582	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	4239	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
13865	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Specification, functional model and information flows—Call transfer supplementary service	4337	Information technology— Telecommunications and information exchange between systems— Private integrated services network— Specification, functional model and information flows—Call transfer supplementary services
13868	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Inter-exchange signalling protocol— Name identification supplementary services	4329	Information technology— Telecommunications and information exchange between systems— Private integrated services network— Inter-exchange signalling protocol— Name identification supplementary services
13873	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Inter-exchange signalling protocol— Diversion supplementary services	—	
13874	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Inter-exchange signalling protocol— Path replacement additional network feature	4328	Information technology— Telecommunications and information exchange between systems— Private integrated services network— Inter-exchange signalling protocol— Path replacement additional network feature

CCITT

Rec.I.112 Vocabulary of terms for ISDNs (Blue Book) —

Rec.I.13 Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN (Blue Book) —
(Note: The correct number is I.130)

Rec.I.210 Principles of telecommunications services supported by an ISDN and the means to describe them (Blue Book) —

Rec.Z.100 Specification and Description Language (Blue Book) —

ITU-T

Q.950 Digital Subscriber Signalling System No. 1 (DSS1)—Supplementary services protocols, structure and general principles —

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AUSTRALIAN/NEW ZEALAND STANDARD

Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call transfer supplementary service

1 Scope

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

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

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 CCITT Recommendation I.130. 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 13865.

The signalling protocol for SS-CT 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.

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This International Standard also specifies additional signalling protocol requirements for the support of interactions at the Q reference point between 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.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11571:1994 *Information technology - Telecommunications and information exchange between systems - Numbering and sub-addressing in private integrated services networks.*

ISO/IEC 11572:1994, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit-mode bearer services - Inter-exchange signalling procedures and protocol.*

ISO/IEC 11574:1994, *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: 1995, *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 .*

ISO/IEC 13865:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Call transfer supplementary service.*

ISO/IEC 13868:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Name identification supplementary services.*

ISO/IEC 13873:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Diversion supplementary services.*

ISO/IEC 13874:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Path replacement additional network feature*.

CCITT Rec. I.112(1988), *Vocabulary of terms for ISDNs (Blue Book)*.

CCITT Rec. I.13(1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN (Blue Book)*.

CCITT Rec. I.210(1988), *Principles of telecommunications services supported by an ISDN and the means to describe them (Blue Book)*.

ITU-T Rec. Q.950(1993), *Digital Subscriber Signalling System No. 1 (DSS1) - Supplementary services protocols, structure and general principles*.

CCITT Rec. Z.100(1988), *Specification and Description Language (Blue Book)*.

4 Definitions

For the purposes of this International Standard, the following definitions apply.

4.1 External definitions

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

Alerting	(ISO/IEC 13865)
Answered	(ISO/IEC 13865)
Application Protocol Data Unit (APDU)	(ISO/IEC 11582)
Basic Service	(CCITT 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)
Originating PINX	(ISO/IEC 11582)
Primary Call	(ISO/IEC 13865)
Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
Private Integrated Services Network Exchange (PINX)	(ISO/IEC 11579-1)
Secondary Call	(ISO/IEC 13865)
Signalling	(CCITT Rec. I.112)
Supplementary Service	(CCITT Rec. I.210)
Supplementary Service Control Entity	(ISO/IEC 11582)
Terminating PINX	(ISO/IEC 11582)
Transfer by join	(ISO/IEC 13865)

Transit PINX	(ISO/IEC 11582)
User	(ISO/IEC 11574)
User A	(ISO/IEC 13865)
User B	(ISO/IEC 13865)
User C	(ISO/IEC 13865)

4.2 Other definitions

4.2.1 End PINX: Within the context of a call, a PINX which is not acting as a Transit PINX, i.e. an Originating PINX, a Terminating PINX, or a Gateway PINX.

4.2.2 Primary PINX: The End PINX which is on the end of the Primary Call nearest to User B.

4.2.3 redirection number: The number of a transferred User, as provided to the PINX of the other transferred User.

4.2.4 Secondary PINX: The End PINX which is on the end of the Secondary Call nearest to User C.

4.2.5 Transferring PINX: The End PINX which initiates the call transfer procedures on behalf of User A.

5 List of acronyms

APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation no. 1
ISDN	Integrated Services Digital Network
NFE	Network Facility Extension
PNP	Private Numbering Plan
PICS	Protocol Implementation Conformance Statement
PISN	Private Integrated Services Network
PINX	Private Integrated Services Network Exchange
SDL	Specification and Description Language
SS-CT	Supplementary Service Call Transfer

6 Signalling protocol for the support of SS-CT

6.1 SS-CT description

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

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

Call transfer can be achieved by using one of two methods; transfer by join and transfer by rerouteing. Support of transfer by join is mandatory. Support of transfer by rerouteing is an option, which, if not supported by all PINXs involved in the operation of call transfer, allows fall back to using transfer by join.

NOTE - When an active call has been transferred to an alerting call, the supervision during the alerting phase and the possible procedures to be followed in case the alerting call remains unanswered are outside the scope of this International Standard.

6.2 SS-CT operational requirements

6.2.1 Provision/Withdrawal

Provision and withdrawal shall be in accordance with 6.2.1 of ISO/IEC 13865.

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 Primary 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 Secondary 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 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.

For SS-CT the requirements are limited to the passing on of Facility information elements for which the destination, as indicated in the NFE, is not the Transit PINX.

6.3 SS-CT coding requirements

6.3.1 Operations

The following operations, defined in Abstract Syntax Notation number 1 (ASN.1) in table 1 shall apply.

Table 1 - Operations in support of SS-CT

Call-Transfer-Operations {iso(1) standard(0) pss1-call-transfer(13869) 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-service-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 (0) recommendation (0) q 950 general-error-list (1)}

PresentedAddressScreened,
PresentedNumberScreened,
PartyNumber,
PartySubaddress

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)};

-- TYPE DEFINITIONS FOR CT OPERATIONS FOLLOW

CallTransferIdentify ::= OPERATION

ARGUMENT

DummyArg

RESULT

CTIdentifyRes

ERRORS{

notAvailable,

invalidCallState,

unspecified,

supplementaryServiceInteractionNotAllowed

}

CallTransferAbandon ::= OPERATION

ARGUMENT

DummyArg

CallTransferInitiate ::= OPERATION

ARGUMENT

CTInitiateArg

RESULT

DummyRes

ERRORS{

notAvailable,

invalidCallState,

invalidRerouteingNumber,

unrecognizedCallIdentity,

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```
    unspecified,  
    supplementaryServiceInteractionNotAllowed  
}
```

CallTransferSetup ::= OPERATION

ARGUMENT

CTSetupArg

RESULT

DummyRes

ERRORS{

notAvailable,

invalidCallState,

invalidRerouteingNumber,

unrecognizedCallIdentity,

unspecified,

supplementaryServiceInteractionNotAllowed

}

CallTransferActive ::= OPERATION

ARGUMENT

CTActiveArg

CallTransferComplete ::= OPERATION

ARGUMENT

CTCompleteArg

CallTransferUpdate ::= OPERATION

ARGUMENT

CTUpdateArg

SubaddressTransfer ::= OPERATION

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ARGUMENT
SubaddressTransferArg

-- TYPE DEFINITIONS FOR CT DATA TYPES FOLLOW

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

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

CTIdentifyRes ::= SEQUENCE {
 callIdentity CallIdentity,
 rerouteingNumber PartyNumber,
 resultExtension CHOICE {
 [6] IMPLICIT Extension,
 [7] IMPLICIT SEQUENCE OF Extension
 } OPTIONAL
}

CTInitiateArg ::= SEQUENCE {
 callIdentity CallIdentity,
 rerouteingNumber PartyNumber,
 argumentExtension CHOICE {
 [6] IMPLICIT Extension,

```
[7] IMPLICIT SEQUENCE OF Extension
} OPTIONAL

}

CTSetupArg ::= SEQUENCE {
    callIdentity          CallIdentity,
    argumentExtension     CHOICE {
        [0] IMPLICIT Extension,
        [1] IMPLICIT SEQUENCE OF Extension
    } OPTIONAL
}

CTActiveArg ::= SEQUENCE{
    connectedAddress      PresentedAddressScreened,
    basicCallInfoElements PSS1InformationElement OPTIONAL,
                                -- ISO/IEC 11572 information element
                                -- Progress indicator is conveyed

    connectedName         Name OPTIONAL,
    argumentExtension     CHOICE {
        [9] IMPLICIT Extension,
        [10] IMPLICIT SEQUENCE OF Extension
    } OPTIONAL
}

CTCompleteArg ::= SEQUENCE {
    endDesignation        EndDesignation,
    redirectionNumber     PresentedNumberScreened,
    basicCallInfoElements PSS1InformationElement OPTIONAL,
                                -- ISO/IEC 11572 information element
                                -- Progress indicator is conveyed
```

redirectionName	Name	OPTIONAL,
callStatus	CallStatus DEFAULT answered,	
argumentExtension	CHOICE {	
	[9] IMPLICIT Extension,	
	[10] IMPLICIT SEQUENCE OF Extension	
	} OPTIONAL	
}		

CTUpdateArg ::= SEQUENCE {

redirectionNumber	PresentedNumberScreened,	
redirectionName	Name	OPTIONAL,
basicCallInfoElements	PSS1InformationElement	OPTIONAL,

-- ISO/IEC 11572 information element
-- Progress indicator is conveyed

argumentExtension	CHOICE {
	[9] IMPLICIT Extension,
	[10] IMPLICIT SEQUENCE OF Extension
	} OPTIONAL
}	

SubaddressTransferArg ::= SEQUENCE {

redirectionSubaddress	PartySubaddress,
argumentExtension	CHOICE {
	[0] IMPLICIT Extension,
	[1] IMPLICIT SEQUENCE OF Extension
	} OPTIONAL
}	

CallStatus ::= ENUMERATED{

```
answered(0),
alerting(1)
}
```

CallIdentity ::= NumericString (SIZE (1..4))

```
EndDesignation ::= ENUMERATED {
    primaryEnd(0),
    secondaryEnd(1)
}
```

-- TYPE DEFINITIONS FOR CT ERRORS FOLLOW

Unspecified ERROR PARAMETER Extension

-- VALUE DEFINITIONS FOR OPERATIONS AND ERRORS FOLLOW

unspecified Unspecified ::= 1008

callTransferIdentify	CallTransferIdentify	::=7
callTransferAbandon	CallTransferAbandon	::= 8
callTransferInitiate	CallTransferInitiate	::=9
callTransferSetup	CallTransferSetup	::=10
callTransferActive	CallTransferActive	::=11
callTransferComplete	CallTransferComplete	::=12
callTransferUpdate	CallTransferUpdate	::=13
subaddressTransfer	SubaddressTransfer	::=14

invalidRerouteingNumber ERROR ::= 1004
-- used when establishment of the new