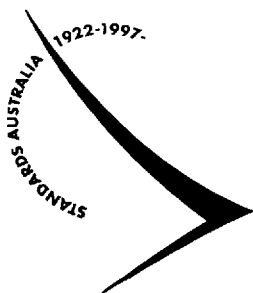


AS/NZS 4342:1997

ISO/IEC 13873:1995

Australian/New Zealand Standard[®]

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



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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 25 August 1997 and on behalf of the Council of Standards New Zealand on 6 August 1997. It was published on 5 November 1997.

The following interests are represented on Committee IT/16:

AUSTEL

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Australian Electrical and electronic Manufacturers Association
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**Information technology—
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Originated as AS/NZS 4342(Int):1995.
Jointly revised and designated AS/NZS 4342:1997.

PUBLISHED JOINTLY BY:

STANDARDS AUSTRALIA
1 The Crescent,
Homebush NSW 2140 Australia

STANDARDS NEW ZEALAND
Level 10, Radio New Zealand House,
155 The Terrace,
Wellington 6001 New Zealand

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT/16, Private Telecommunication Networking, to supersede AS/NZS 4342(Int):1995.

This Standard is identical with, and has been reproduced from, ISO/IEC 13873:1995, *Information technology—Telecommunications and information exchange between systems—Private Integrated Services Network—Inter-exchange signalling protocol—Call diversion supplementary services*.

The objective of this Standard is to provide private integrated services network (PISN) designers and users with the specification of the signalling protocol for use at the Q reference point between PISN exchanges in order to allow incoming calls to a served user to be diverted to another user number.

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.

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 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

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

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

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

ISO/IEC		AS/NZS	
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 configurations 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
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
13869	Information technology— Telecommunications and information exchange between systems—Private Integrated Services Network—Inter-exchange signalling protocol—Call transfer supplementary services	4339	Information technology— Telecommunications and information exchange between systems—Private integrated services network—Inter-exchange signalling protocol—Call transfer supplementary services
13870	Information technology— Telecommunications and information exchange between systems—Private Integrated Services Network—Inter-exchange signalling protocol—Call completion supplementary services	4340	Information technology— Telecommunications and information exchange between systems—Private integrated services network—Inter-exchange signalling protocol—Call completion supplementary services
13872	Information Technology— Telecommunications and information exchange between systems—Private Integrated Services Network—Service description, functional capabilities and information flows—Call diversion supplementary services	4341	Information technology— Telecommunications and information exchange between systems—Private integrated services network—Specification, functional model and information flows—Call diversion supplementary services
ITU-T			
Rec.I.112	Vocabulary of terms for ISDNs services (Blue Book)	—	

ITU-T

- | | | |
|-----------|--|---|
| Rec.I.130 | Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN (Blue Book) | — |
| Rec.I.210 | Principles of telecommunication services supported by an ISDN and the means to describe them (Blue Book) | — |
| Rec.I.221 | Common specific characteristics of services (Blue Book) | — |
| Rec.Q.950 | Digital subscriber Signalling System No. 1(DSS1)—Supplementary services protocols, structure and general principles | — |
| Rec.Q.952 | Stage 3 service description for call offering supplementary services using DSS 1—Diversion supplementary services | — |
| Rec.Z.100 | Specification and description language (Blue Book) | — |

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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 diversion supplementary services

1 Scope

This International Standard specifies the signalling protocol for the support of Call Diversion supplementary services (SS-DIV) at the Q reference point between Private Integrated Services Network Exchanges (PINXs) connected together within a Private Integrated Services Network (PISN). The Call Diversion supplementary services are Call Forwarding Unconditional (SS-CFU), Call Forwarding Busy (SS-CFB), Call Forwarding No Reply (SS-CFNR) and Call Deflection (SS-CD).

SS-CFU, SS-CFB, SS-CFNR and SS-CD are supplementary services which permit a served user to have the PISN send all or specific incoming calls addressed to the served user's PISN number to another number.

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 Rec. 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 13872.

The signalling protocol for SS-DIV 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 SS-DIV and other supplementary services and ANFs.

This International Standard is applicable to PINXs which can be interconnected 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 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 13868: 1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Name identification supplementary services.*

ISO/IEC 13869: 1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call transfer supplementary services .*

ISO/IEC 13870: 1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call completion supplementary services.*

ISO/IEC 13872: 1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Service description, functional capabilities and information flows - Call diversion supplementary services.*

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

CCITT Rec. I.130 (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 telecommunication services supported by an ISDN and the means to describe them (Blue Book).*

CCITT Rec. I.221 (1988), *Common specific characteristics of services (Blue Book).*

CCITT Rec. Z.100 (1988), *Specification and description language (Blue Book).*

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

ITU-T Rec. Q.952 (1993), *Stage 3 service description for call offering supplementary services using DSS 1 - Diversion supplementary services.*

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:

- Application Protocol Data Unit (APDU)	(ISO/IEC 11582)
- Basic Service	(CCITT Rec. I.210)
- Call, Basic Call	(ISO/IEC 11582)
- Coordination Function	(ISO/IEC 11582)
- End PINX	(ISO/IEC 11572)
- Incoming Gateway PINX	(ISO/IEC 11572)
- Interpretation APDU	(ISO/IEC 11582)
- Network determined user busy	(CCITT Rec. I.221)
- Notification	(ISO/IEC 11582)
- Originating PINX	(ISO/IEC 11572)
- Outgoing Gateway PINX	(ISO/IEC 11572)
- Primary PINX	(ISO/IEC 13869)

- Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
- Private Integrated Services Network Exchange (PINX)	(ISO/IEC 11579-1)
- Secondary PINX	(ISO/IEC 13869)
- Signalling	(CCITT Rec. I.112)
- Supplementary Service	(CCITT Rec. I.210)
- Supplementary Service Control Entity	(ISO/IEC 11582)
- Terminating PINX	(ISO/IEC 11572)
- Transferring PINX	(ISO/IEC 13869)
- Transit PINX	(ISO/IEC 11572)
- User	(ISO/IEC 11574)
- User determined user busy	(CCITT Rec. I.221)

4.2 Other definitions

4.2.1 Activating PINX

The Activating PINX is the PINX serving the activating user.

4.2.2 Busy

An ISDN destination is considered to be busy if either a "network determined user busy" or a "user determined user busy" condition exists.

4.2.3 Connected number

The number of the user that answers (user C).

4.2.4 Deactivating PINX

The Deactivating PINX is the PINX serving the deactivating user.

4.2.5 Diversion

Diversion is the redirection of a call, on request of a called user and prior to answer, to a number different from the number of that called user.

4.2.6 Diverted-to number

The diverted-to number is the number to which a call is diverted.

4.2.7 Diverted-to PINX

The Diverted-to PINX is the PINX serving the diverted-to user.

4.2.8 Diverted-to user

The diverted-to user is the user to which a call is diverted.

4.2.9 Diverting cause

The diverting cause is a parameter which contains the reason for the diversion, e.g. CFU, CFB, CFNR.

4.2.10 Diverting number

The diverting number is the number of the served user.

4.2.11 Forwarding

Forwarding is the type of diversion invoked automatically by the network in accordance with information previously registered in the network against the called number.

4.2.12 Forward switching

A network routing algorithm which performs the diversion by joining together the first connection from user A's node to user B's node and a second, new connection from user B's node to user C's node.

4.2.13 Interrogating PINX

The Interrogating PINX is the PINX serving the interrogating user.

4.2.14 Last diverting user

The last diverting user is the served user from the point of view of the diverted-to user for a particular stage of call diversion. In the case of a call subject to a single stage of call diversion, user B is the last diverting user from the point of view of user C. In the case of a call subject to multiple stages of call diversion, user B1 is the last diverting user from the point of view of user B2, user B2 is the last diverting user from the point of view of user B3, etc. The served user for the final stage of call diversion is the last diverting user from the point of view of user C.

4.2.15 Original called number

The original called number is the number of User B (in case of multiple call diversion user B1).

4.2.16 Original called user

The original called user is the first served user of a call which is subject to one or more stages of call diversion, i.e. user B or B1.

4.2.17 Partial rerouting

A network routing algorithm which performs the call diversion by replacing a particular part of the connection from user A's node (located in the public ISDN) to user B's node (located in a PISN) by another connection from user A's node to user C's node (located in the public ISDN). The new connection is established completely within the public ISDN by joining together the original connection from user A's node to the public ISDN gateway node and a second, new connection from the public ISDN gateway node to user C's node.

4.2.18 Presentation indicator

The presentation indicator is the indicator showing whether the diverted-to number should be presented to the calling user, as derived from user C's Calling/connected Line Identification Restriction (CLIR) supplementary service.

4.2.19 Rerouting

A network routing algorithm which performs the call diversion by replacing the connection from user A's node to user B's node by another connection from user A's node to user C's node.

4.2.20 Rerouting PINX

A Rerouting PINX is the PINX which executes call diversion.

NOTE - In case of rerouting, the Rerouting PINX is either the Originating PINX or the Incoming Gateway PINX. In case of forward switching, the Rerouting PINX is the Terminating PINX.

4.2.21 Served user

The served user is the user of a particular PISN number who is requesting that calls to his/her number be diverted. This user may also be referred to as the diverting user or the called user.

4.2.22 User A

User A is the calling user of a call which is subject to call diversion.

4.2.23 User B

User B is the served (diverting) user of a call which is subject to call diversion.

4.2.24 User B1, user B2, user B3, etc.

These are the served (diverting) users of a call which are subject to multiple stages of diversion. B1 is the first served user, B2 is the second served user, B3 is the third served user, etc.

NOTE - B2 is also the diverted-to user with respect to the first stage of call diversion, B3 is also the diverted-to user with respect to the second stage of call diversion, etc.

4.2.25 User C

User C is the diverted-to user with respect to the final stage of call diversion.

5 List of acronyms

ANF	Additional Network Feature
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation One
CLIR	Calling/connected Line Identification Restriction
DTN	Diverted-to Number
ISDN	Integrated Services Digital Network
NDUB	Network Determined User Busy
NFE	Network Facility Extension
NSO	Notification Subscription Option
PICS	Protocol Implementation Conformance Statement
PISN	Private Integrated Services Network
PINX	Private Integrated Services Network Exchange
SDL	Specification and Description Language
SS	Supplementary Service
SS-CDA	Call Deflection from Alert supplementary service
SS-CDI	Call Deflection Immediate supplementary service
SS-CF	Call Forwarding supplementary service
SS-CFB	Call Forwarding Busy supplementary service

SS-CFNR	Call Forwarding No Reply supplementary service
SS-CFU	Call Forwarding Unconditional supplementary service
SS-CLIR	Calling/Connected Line Identification Restriction supplementary service
SS-CNIP	Calling Name Identification Presentation supplementary service
SS-CNIR	Calling/Connected Name Identification Restriction supplementary service
SS-DIV	Call Diversion supplementary services
TE	Terminal Equipment
UDUB	User Determined User Busy

6 Signalling protocol for the support of SS-DIV

6.1 SS-DIV description

SS-CFU enables a served user to have the PISN redirect to another user, calls which are addressed to the served user's PISN number. SS-CFU may operate on all calls or just those associated with specified basic services. The served user's ability to originate calls is unaffected by SS-CFU. After CFU has been activated calls are forwarded independently of the status of the served user.

SS-CFB enables a served user to have the PISN redirect to another user, calls which are addressed to the served user's PISN number and meet busy. SS-CFB may operate on all calls or just those associated with specified basic services. The served user's ability to originate calls is unaffected by SS-CFB.

SS-CFNR enables a served user to have the PISN redirect to another user, calls which are addressed to the served user's PISN number, and for which the connection is not established within a predefined period of time. SS-CFNR may operate on all calls or just those associated with specified basic services. The served user's ability to originate calls is unaffected by SS-CFNR.

The Call Deflection supplementary service (SS-CD) has no explicit impact on this standard. Support for the two versions of CD, as defined in ISO/IEC 13872, is achieved as follows:

- Call Deflection from Alert (CDA) is covered by the signalling protocol of SS-CFNR,
- Call Deflection Immediate (CDI) is covered by the signalling protocol of SS-CFU.

The maximum number of diversions to a single call is an implementation option. When counting the number of diversions, all types of diversions shall be included.

These supplementary services are applicable to all basic services defined in ISO/IEC 11574.

6.2 SS-DIV operational requirements

6.2.1 Provision/withdrawal

Provision and withdrawal shall be in accordance with the related classes of subscription options that have an impact on the signalling protocol at the Q reference point as summarized in Table 1.

Table 1 - Subscription options

Subscription Parameter	Value
Calling user receives notification that call has been diverted	- No - Yes without diverted-to number/name - Yes with diverted-to number/name
Served user releases his/her number/name to diverted to user	- No - Yes

The service will be withdrawn by the service provider at the subscriber request or for administration reasons.

The subscription parameters and values offered by a PINX are an implementation matter. A PISN may offer more or less parameters and values than those specified in this clause.

6.2.2 Requirements on the Originating PINX

Call establishment procedures for the outgoing side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

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

6.2.3 Requirements on the Served User PINX

Call establishment for the incoming side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

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

Generic procedures for the call independent control (connection orientated) of supplementary services, as specified in ISO/IEC 11582 for a Terminating PINX, shall apply if the remote activation, deactivation or interrogation procedure is supported.

Generic procedures for the call independent control (connection orientated) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX, shall apply if the procedure for verification of the diverted-to number is supported.

6.2.4 Requirements on the Diverted-to PINX

Call establishment for the incoming side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

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

Generic procedures for the call independent control (connection orientated) of supplementary services, as specified in ISO/IEC 11582 for a Terminating PINX, shall apply if the procedure for verification of the diverted-to number is supported.

6.2.5 Requirements on the Rerouting PINX

Call establishment for the outgoing and incoming side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

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

Basic call procedures for call establishment and call clearing at a Transit PINX, as specified in ISO/IEC 11572, shall apply.

Generic procedures for the call related control and call independent control (connection orientated) of supplementary services, as specified in ISO/IEC 11582 for a Transit PINX, shall apply. In addition, the generic procedures for notification, as specified in ISO/IEC 11582 for a Transit PINX, shall apply.

6.2.7 Requirements on the Activating PINX

Generic procedures for the call independent control (connection orientated) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX, shall apply.

6.2.8 Requirements on the Deactivating PINX

Generic procedures for the call independent control (connection orientated) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX, shall apply.

6.2.9 Requirements on the Interrogating PINX

Generic procedures for the call independent control (connection orientated) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX, shall apply.

6.3 SS-DIV coding requirements

6.3.1 Operations

The operations defined in Abstract Syntax Notation number 1 (ASN.1) in table 2 shall apply.

Table 2 - Operations in Support of SS-DIV (sheet 1 of 6)

Call-Diversion-Operations

{ iso (1) standard (0) pss1-call-diversion (13873) call-diversion-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 standard pss1-generic-procedures (11582) msi-definition (0) }

PSS1InformationElement FROM PSS1-generic-parameters-definition

{ iso standard pss1-generic-procedures (11582) PSS1-generic-parameters (6) }

Address, PartyNumber, PartySubaddress, PresentedNumberScreened,

PresentedNumberUnscreened, PresentationAllowedIndicator FROM

Addressing-Data-Elements

{ iso standard pss1-generic-procedures (11582) addressing-data-elements (9) }

Name, FROM Name-Operations

{ iso standard pss1-name (13868) name-operations (0) }

userNotSubscribed, notAvailable, invalidServedUserNr, basicServiceNotProvided,
resourceUnavailable, supplementaryServiceInteractionNotAllowed FROM General-
Error-List

{ ccitt recommendation q 950 general-error-list (1) };

Table 2 - Operations in Support of SS-DIV (sheet 2 of 6)

ActivateDiversionQ OPERATION

-- Sent from the Activating PINX to the Served User PINX

ARGUMENT SEQUENCE

```

{ procedure Procedure,
  basicService          BasicService,
  divertedToAddress     Address,
  servedUserNr         PartyNumber,
  activatingUserNr      PartyNumber,
  extension CHOICE {
    [1] IMPLICIT Extension ,
    [2] IMPLICIT SEQUENCE OF Extension } OPTIONAL }

```

```

RESULT CHOICE {
  NULL,
  [1] IMPLICIT Extension ,
  [2] IMPLICIT SEQUENCE OF Extension }

```

```

ERRORS { notSubscribed, notAvailable, invalidServedUserNr,
  basicServiceNotProvided, resourceUnavailable, invalidDivertedToNr,
  specialServiceNr, diversionToServedUserNr, temporarilyUnavailable,
  notAuthorized, unspecified }

```

DeactivateDiversionQ OPERATION

-- Sent from the Deactivating PINX to the Served User PINX

ARGUMENT SEQUENCE

```

{ procedure Procedure,
  basicService          BasicService,
  servedUserNr         PartyNumber,
  deactivatingUserNr   PartyNumber,
  extension CHOICE {
    [1] IMPLICIT Extension ,
    [2] IMPLICIT SEQUENCE OF Extension } OPTIONAL }

```

```

RESULT CHOICE {
  NULL,
  [1] IMPLICIT Extension ,
  [2] IMPLICIT SEQUENCE OF Extension }

```

```

ERRORS {notSubscribed, notAvailable, invalidServedUserNr,
  temporarilyUnavailable, notAuthorized, unspecified }

```

InterrogateDiversionQ OPERATION

-- Sent from the Interrogating PINX to the Served User PINX

ARGUMENT SEQUENCE

```

{ procedure Procedure,
  basicService          BasicService DEFAULT allServices,
  servedUserNr         PartyNumber,
  interrogatingUserNr   PartyNumber,
  extension CHOICE {
    [1] IMPLICIT Extension ,
    [2] IMPLICIT SEQUENCE OF Extension } OPTIONAL }

```

```

RESULT IntResultList

```

```

ERRORS {notSubscribed, notAvailable, invalidServedUserNr,
  temporarilyUnavailable, notAuthorized, unspecified }

```

Table 2 - Operations in Support of SS-DIV (sheet 3 of 6)

CheckRestriction OPERATION

-- Sent from the Served User PINX to the Diverted-to PINX

ARGUMENT SEQUENCE

{	servedUserNr	PartyNumber,
	basicService	BasicService,
	divertedToNr	PartyNumber,
	extension CHOICE {	
	[1] IMPLICIT Extension ,	
	[2] IMPLICIT SEQUENCE OF Extension } OPTIONAL }	

RESULT	CHOICE {	NULL,
		[1] IMPLICIT Extension,
		[2] IMPLICIT SEQUENCE OF Extension }

ERRORS	{notAvailable, invalidServedUserNr,
	invalidDivertedToNr, specialServiceNr, unspecified }

CallRerouteing OPERATION

-- Sent from the Served User PINX to the Rerouteing PINX

ARGUMENT SEQUENCE

{	rerouteingReason	DiversionReason,
	originalRerouteingReason	[0] IMPLICIT DiversionReason OPTIONAL,
	calledAddress	Address,
	diversionCounter	INTEGER (1..15),
	pSS1InfoElement	PSS1InformationElement

-- The basic call information elements Bearer capability, High layer compatibility, Low

-- layer compatibility and Progress indicator can be embedded in the

-- pSS1InfoElement in accordance with 6.5.3.1.5.

lastRerouteingNr	[1] PresentedNumberUnscreened,
subscriptionOption	[2] IMPLICIT SubscriptionOption,
callingPartySubaddress	[3] PartySubaddress OPTIONAL,
callingNumber	[4] PresentedNumberScreened,
callingName	[5] Name OPTIONAL,
originalCalledNr	[6] PresentedNumberUnscreened OPTIONAL,
redirectingName	[7] Name OPTIONAL,
originalCalledName	[8] Name OPTIONAL,
extension CHOICE {	
	[9] IMPLICIT Extension ,
	[10] IMPLICIT SEQUENCE OF Extension } OPTIONAL }

RESULT	CHOICE {	NULL,
		[1] IMPLICIT Extension ,
		[2] IMPLICIT SEQUENCE OF Extension }

ERRORS	{notSubscribed, notAvailable, resourceUnavailable,
	invalidDivertedToNr, specialServiceNr, diversionToServedUserNr,
	numberOfDiversionExceeded,
	supplementaryServiceInteractionNotAllowed, unspecified }

-- The error value numberOfDiversionExceeded applies only in case of partial rerouteing.

Table 2 - Operations in Support of SS-DIV (sheet 4 of 6)

DivertingLegInformation1 OPERATION

-- Sent from the Rerouteing PINX to the Originating PINX

ARGUMENT SEQUENCE

{	diversionReason	DiversionReason,
	subscriptionOption	SubscriptionOption,
	nominatedNr	PartyNumber,
	extension CHOICE {	
	[9] IMPLICIT Extension ,	
	[10] IMPLICIT SEQUENCE OF Extension)	OPTIONAL }

DivertingLegInformation2 OPERATION

-- Sent from the Rerouteing PINX to the Diverted-to PINX

ARGUMENT SEQUENCE

{	diversionCounter	INTEGER (1..15),
	diversionReason	DiversionReason,
	originalDiversionReason	[0] IMPLICIT DiversionReason OPTIONAL,
	divertingNr	[1] PresentedNumberUnscreened OPTIONAL,
	originalCalledNr	[2] PresentedNumberUnscreened OPTIONAL,
	redirectingName	[3] Name OPTIONAL,
	originalCalledName	[4] Name OPTIONAL,
	extension CHOICE {	
	[5] IMPLICIT Extension ,	
	[6] IMPLICIT SEQUENCE OF Extension)	OPTIONAL }

-- The divertingNr element is mandatory except in the case of interworking.

DivertingLegInformation3 OPERATION

-- Sent from the Diverted-to PINX to the Originating PINX

ARGUMENT SEQUENCE

{	presentationAllowedIndicator	PresentationAllowedIndicator,
	redirectionName	[0] Name OPTIONAL,
	extension CHOICE {	
	[1] IMPLICIT Extension ,	
	[2] IMPLICIT SEQUENCE OF Extension)	OPTIONAL }

CfmrDivertedLegFailed OPERATION

-- Sent from the Rerouteing PINX to the Served User PINX

ARGUMENT CHOICE {

NULL,
[1] IMPLICIT Extension ,
[2] IMPLICIT SEQUENCE OF Extension)

-- This indicates that the diverted-to leg has been cleared during SS-CFNR execution.

Table 2 - Operations in Support of SS-DIV (sheet 5 of 6)

- - Definitions of general used data types:

DiversionReason ::= ENUMERATED { unknown (0), cfu (1), cfb (2), cfnr (3)}

- - The value unknown is only used if received from another network when interworking.

IntResultList ::= SET SIZE (0...29) OF IntResult

IntResult ::= SEQUENCE

servedUserNr PartyNumber,
 basicService BasicService,
 procedure Procedure,
 divertedToAddress Address,
 remoteEnabled BOOLEAN DEFAULT FALSE,
 extension CHOICE {
 [1] IMPLICIT Extension ,
 [2] IMPLICIT SEQUENCE OF Extension }
 OPTIONAL }

Procedure ::= ENUMERATED { cfu (0), cfb (1), cfnr (2) }

SubscriptionOption ::= ENUMERATED {
 noNotification (0),
 notificationWithoutDivertedToNr (1),
 notificationWithDivertedToNr (2) }

invalidDivertedToNr ERROR ::= 12
 specialServiceNr ERROR ::= 14
 diversionToServedUserNr ERROR ::= 15
 numberOfDiversionExceeded ERROR ::= 24
 temporarilyUnavailable ERROR ::= 1000
 notAuthorized ERROR ::= 1007
 unspecified Unspecified ::= 1008

Unspecified ERROR PARAMETER Extension

BasicService ::= ENUMERATED {
 allServices (0)
 speech (1)
 unrestrictedDigitalInformation (2)
 audio3.1KHz (3)
 telephony (32)
 teletex (33)
 telefaxGroup4Class1 (34)
 videotexSyntaxBased (35)
 videotelephony (36) }

Table 2 - Operations in Support of SS-DIV (sheet6 of 6)

activateDiversionQ	ActivateDiversionQ	::= 15
deactivateDiversionQ	DeactivateDiversionQ	::= 16
interrogateDiversionQ	InterrogateDiversionQ	::= 17
checkRestriction	CheckRestriction	::= 18
callRerouteing	CallRerouteing	::= 19
divertingLegInformation1	DivertingLegInformation1	::= 20
divertingLegInformation2	DivertingLegInformation2	::= 21
divertingLegInformation3	DivertingLegInformation3	::= 22
cfmrDivertedLegFailed	CfmrDivertedLegFailed	::= 23

END -- of Call-Diversion-Operations

6.3.2 Information elements

6.3.2.1 Facility information element

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 the operations divertingLegInformation 1, divertingLegInformation 2, divertingLegInformation 3 and/or cfmrDivertedLegFailed the interpretation APDU shall be included and shall contain the value discardAnyUnrecognisedInvoke APDU. When conveying the invoke APDU of the callRerouting operation, the Interpretation APDU may be omitted, or may be included with the value "rejectAnyUnrecognizedInvokePDU". In all other cases, the Interpretation APDU may be omitted or may be included, with either the value "rejectAnyUnrecognizedPDU" or "clearCallIfAnyInvokePDUNotRecognized".

6.3.2.2 Notification indicator information element

The general structure and coding of the Notification indicator information element is specified in ISO/IEC 11582, 11.3.4.

The following specific Notification Description value shall be used for the diversion notification from the Outgoing Gateway PINX to the Originating PINX as received from the public ISDN:

- call is diverting: "111 1011" (Bits 765 4321).

The Redirection number information element received from the public ISDN and sent by the Outgoing Gateway PINX to the Originating PINX shall be included in the argument of notification pss11eNotification (as defined in ISO/IEC 11582, Annex B) within a second Notification indicator information element. The following Notification Description value shall be used for this purpose:

- discriminator for extension to ISO defined ASN.1 encoded notification data structure:
"100 0000" (Bits 765 4321).

The Redirection number information element shall be encoded as specified in ITU-T Rec. Q.952.

6.3.3 Messages

The Facility information element and the Notification indicator information element shall be conveyed in the messages as specified in ISO/IEC 11582, clause 10. The basic call messages shall be used for call establishment and release as specified in ISO/IEC 11572.

6.4 SS-DIV state definitions

6.4.1 States at the Originating PINX

The procedures for the Originating PINX are written in terms of the following conceptual states existing within the SS-DIV Supplementary Service Control entity in that PINX in association with a particular call:

- * CDO-Idle: No divertingLegInformation1 invoke APDU has been received.
- * CDO-Divert: The divertingLegInformation1 invoke APDU has been received and the subscription option of the served user and the diverted-to number have been stored.

6.4.2 States at the Served User PINX

The procedures for the Served User PINX are written in terms of the following conceptual states existing within the SS-DIV Supplementary Service Control entity. There are different state machines for activation, deactivation, interrogation and invocation of call diversion:

Activation states (in association with a particular request for activation):

- * CDS-Act-Idle: No processing of an activateDiversionQ invoke APDU.
- * CDS-Act-Wait: The Served User PINX has received an activation request and has sent a checkRestriction invoke APDU to the Diverted-to PINX.

Deactivation state (in association with a particular request for deactivation):

- * CDS-Deact-Idle: No processing of a deactivateDiversionQ invoke APDU.

Interrogation state (in association with a particular request for interrogation):

- * CDS-Inter-Idle: No processing of an interrogateDiversionQ invoke APDU.

Invocation states (in association with a particular call):

- * CDS-Inv-Idle: Diversion invocation not in progress.
- * CDS-Requested: The Served User PINX has sent a callRerouting invoke APDU to the Rerouting PINX and is waiting for receipt of an return result, return error or reject APDU.

6.4.3 States at the Diverted-to PINX

The procedures for the Diverted-to PINX are written in terms of the following conceptual states existing within the SS-DIV Supplementary Service Control entity in that PINX. There are different state machines for the invocation of call diversion and restriction checking:

Invocation states (in association with a particular call):

- * CDF-Inv-Idle: No processing of a divertingLegInformation2 invoke APDU.
- * CDF-Inv-Wait: A divertingLegInformation2 invoke APDU has been received and the Diverted-to PINX is waiting for valid presentation restriction information.

Check restriction state (in association with a particular request for validating a diverted-to number):

- * CDF-Res-Idle: No processing of a checkRestriction invoke APDU.

6.4.4 States at the Rerouteing PINX

The procedures for the Rerouteing PINX are written in terms of the following conceptual states existing within the SS-DIV Supplementary Service Control entity in that PINX in association with a particular call:

- * CDR-Idle: Rerouteing not in progress.
- * CDR-Invoked: The CFNR rerouteing procedure has been successfully performed and the Rerouteing PINX is waiting for completion of establishment of the call to the diverted-to user.

6.4.5 States at the Activating PINX

The procedures for the Activating PINX are written in terms of the following conceptual states existing within the SS-DIV Supplementary Service Control entity in that PINX:

- * CDA-Idle: Activation not in progress.
- * CDA-Wait: An activateDiversionQ invoke APDU has been sent. The Activating PINX is waiting for the response.

6.4.6 States at the Deactivating PINX

The procedures for the Deactivating PINX are written in terms of the following conceptual states existing within the SS-DIV Supplementary Service Control entity in that PINX:

- * CDD-Idle: Deactivation not in progress.
- * CDD-Wait: A deactivateDiversionQ invoke APDU has been sent. The Deactivating PINX is waiting for the response.

6.4.7 States at the Interrogating PINX

The procedures for the Interrogating PINX are written in terms of the following conceptual states existing within the SS-DIV Supplementary Service Control entity in that PINX:

- * CDI-Idle: Interrogation not in progress.
- * CDI-Wait: An interrogateDiversionQ invoke APDU has been sent. The Interrogating PINX is waiting for the response.

6.5 SS-DIV Signalling procedures

Annex D shows some examples of message sequences of the signalling procedures.

6.5.1 Actions at the Originating PINX

When an Originating PINX also provides Rerouteing PINX functionality, in support of call diversion by rerouteing, the joint requirements of 6.5.1 (for an Originating PINX) and 6.5.4 (for a Rerouteing PINX) shall apply, with the exception that any communication between the Originating PINX functionality and the Rerouteing PINX functionality will be an intra-PINX matter. The messages specified for sending from the Originating PINX towards the Rerouteing PINX or vice versa will not appear on any inter-PINX link.

NOTE - The Originating PINX can act also as Rerouteing PINX in all cases where call diversion by rerouteing is appropriate.

6.5.1.1 Normal Procedure

On receipt of a divertingLegInformation1 invoke APDU in a FACILITY or CONNECT message while in basic call protocol control state Overlap Sending, Outgoing Call Proceeding or Call Delivered and in state CDO-Idle, the Originating PINX shall take account of the information therein and enter state CDO-Divert. In determining whether to notify the calling user, the Originating PINX shall take account of the value of element subscriptionOption. If the value noNotification has been received, no notification of diversion shall be given to the

calling user. Otherwise a notification of diversion shall be given to the calling user if the capability exists. The diverted-to number and subaddress shall not be presented to the calling user at this stage. When the divertingLegInformation1 invoke APDU has been received in a CONNECT message, a divertingLegInformation3 invoke APDU in the same message shall be handled as specified below.

On receipt of a divertingLegInformation1 invoke APDU in a FACILITY or CONNECT message while in state CDO-Divert, the Originating PINX shall take account of the information therein and remain in the same state. If the value of element diversionReason is cfu or cfb, no notification of this further diversion shall be given to the calling user. If the value of element diversionReason is cfnr, account shall be taken of the value of element subscriptionOption in this APDU and in all previously received divertingLegInformation1 invoke APDUs for this call. If this or any previous value is noNotification, no notification shall be given to the calling user. Otherwise a notification of further diversion shall be given to the calling user if the capability exists. The diverted-to number and subaddress shall not be presented to the calling user at this stage. When the divertingLegInformation1 invoke APDU has been received in a CONNECT message, a divertingLegInformation3 invoke APDU in the same message shall be handled as specified below.

On receipt of a divertingLegInformation3 invoke APDU in an ALERTING, CONNECT or FACILITY message while in state CDO-Divert, the Originating PINX shall take account of the information therein, shall remain in the same state if received in an ALERTING or FACILITY message, and shall enter state CDO-Idle if received in a CONNECT message. The diverted-to number (as received in element nominatedNr of the last received diversionLegInformation1 invoke APDU) shall be presented to the calling user, if the capability exists, only if all of the following conditions are true:

- all previously received divertingLegInformation1 invoke APDUs contained value notificationWith-DivertedToNr in element subscriptionOption; and
- this and any previously received divertingLegInformation3 invoke APDUs contained value TRUE in element of type PresentationAllowedIndicator; and
- no previous notification of a diverted-to number has been given to the calling user unless, since then, a divertingLegInformation1 invoke APDU with value cfnr in element diversionReason has been received.

The diverted-to name (as received in element redirectionName of the divertingLegInformation3 invoke APDU) may be presented to the calling user, if the capability exists, only if all of the three conditions above for the presentation of the diverted-to number are true and if not marked, within the element redirectionName, as presentation restricted.

On receipt of a CONNECT message, the Originating PINX shall enter state CDO-Idle.

NOTE - In case of where a call enters another network from the PISN and call diversion occurs in that other network, no divertingLegInformation1 or divertingLegInformation3 invoke APDUs will be received by the Originating PINX. Instead, notification(s) of the diversion in accordance with 6.3.2.2 may be received from the Outgoing Gateway PINX. Such notifications will be handled in accordance with ISO/IEC 11582, 7.4.3.3.

6.5.1.2 Exceptional Procedures

On call clearing during state CDO-Divert, the Originating PINX shall enter state CDO-Idle.

6.5.2 Actions at a Transit PINX

No special actions are recognized.

6.5.3 Actions at the Served User PINX

In the context of invocation, when a Served User PINX also provides Rerouteing PINX functionality, in support of call diversion by forward switching, the joint requirements of 6.5.3 (for a Served User PINX) and 6.5.4 (for a Rerouteing PINX) shall apply, with the exception that any communication between the Served User PINX functionality and the Rerouteing PINX functionality will be an intra-PINX matter. The messages specified for sending from the Served User PINX towards the Rerouteing PINX or vice versa will not appear on any inter-PINX link.