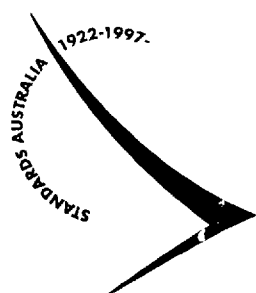


AS/NZS 4341:1997
ISO/IEC 13872:1995

Australian/New Zealand Standard[®]

**Information technology—
Telecommunications and
information exchange between
systems—Private integrated
services network—Specification,
functional model and information
flows—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.

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AS/NZS 4341:1997

Australian/New Zealand Standard[®]

Information technology— Telecommunications and information exchange between systems—Private integrated services network—Specification, functional model and information flows—Call diversion supplementary services

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT/16, Private Telecommunication Networking, to supersede AS/NZS 4341(Int):1995.

This Standard is identical with, and has been reproduced from, ISO/IEC 13872:1995, *Information technology—Telecommunications and information exchange between systems—Private Integrated Services Network—Specification, functional model and information flows—Call diversion supplementary services*.

The objective of this Standard is to provide private integrated services network (PISN) designers and users with the specification for call diversion in order to allow incoming calls to a served user to be diverted to another user 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 tables 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 and title pages.

The term 'informative' has been used in this Standard to define the application of the annex to which it applies. 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:

<i>Reference to International Standard or other Publication</i>		<i>Australian/New Zealand Standard</i>	
ISO/IEC		AS/NZS	
11571	Information technology— Telecommunications and information exchange between systems— Numbering and subaddressing in private integrated services networks	4134	Information technology— Telecommunications and information exchange between systems— Numbering and sub-addressing in private integrated services networks
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

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ISO/IEC		AS/NZS	
11579	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network	4136	Information technology— Telecommunication 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)
14136	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Specification, functional model and information flows—Identification supplementary services	XXXX	Information technology— Telecommunications and information exchange between systems— Private integrated services network— Specification, functional model and information flows—Identification supplementary services
13864	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Specification, functional model and information flows—Name Identification supplementary services—Stages 1 and 2	4336	Information technology— Telecommunications and information exchange between systems— Private integrated services network— Specification, functional model and information flows—Name identification supplementary services
ITU-T			
Rec.I.112	Vocabulary of terms for ISDNs (Blue Book)	—	
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.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 -- Specification, functional model and information flows -- Call diversion supplementary services

1 Scope

This International Standard specifies the supplementary services Call Forwarding Unconditional (CFU), Call Forwarding Busy (CFB), Call Forwarding No Reply (CFNR) and Call Deflection (CD), which are applicable to various basic services supported by Private Integrated Services Networks (PISN). Basic services are specified in ISO/IEC 11574.

SS-CFU, SS-CFB and SS-CFNR are supplementary services which apply during call establishment providing a diversion of an incoming call to an other destination. SS-CD is a supplementary service which allows a served user to respond to an incoming call by requesting redirection of that call to another number specified in the response.

Supplementary service specifications are produced in three stages, according to the method described in CCITT Rec. I.130. This International Standard contains the stage 1 and stage 2 specifications of the Call Diversion supplementary services. The stage 1 specifications (clauses 6, 7, 8 and 9) specify the supplementary services as seen by users of PISNs. The stage 2 specification (clause 10) identifies the functional entities involved in the supplementary services and the information flows between them.

2 Conformance

In order to conform to this International Standard, a stage 3 International Standard shall specify signalling protocols and equipment behaviour that are capable of being used in a PISN which supports the supplementary services specified in this International Standard. This means that, to claim conformance, a stage 3 International Standard is required to be adequate for the support of those aspects of clauses 6, 7, 8 and 9 (stage 1) and clause 10 (stage 2) which are relevant to the interface or equipment to which the stage 3 International Standard applies.

A stage 3 International Standard for SS-CFU shall support clauses 6 and 10 respectively.

A stage 3 International Standard for SS-CFB shall support clauses 7 and 10 respectively.

A stage 3 International Standard for SS-CFNR shall support clauses 8 and 10 respectively.

A stage 3 International Standard for SS-CD shall support clauses 9 and 10 respectively.

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

ISO/IEC 13864: 1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Name Identification supplementary services - Stages 1 and 2.*

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).*

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

- Basic Service	(CCITT Rec. I.210)
- Connection	(CCITT Rec. I.112)
- Integrated Services Digital Network	(CCITT Rec. I.112)
- Service	(CCITT Rec. I.112)
- Signalling	(CCITT Rec. I.112)
- Supplementary Service	(CCITT Rec. I.210)
- Private Integrated Services Network Exchange (PINX)	(ISO/IEC 11579-1)
- Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
- User(ISO/IEC 11574)	

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

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

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

- r1
- r2
- r3

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

- DISCONNECT request/indication
- REPORT request/indication
- RELEASE request/indication
- SETUP request/indication
- SETUP response/confirmation
- SETUP REJECT request/indication

4.2 Other definitions

4.2.1 Additional network feature

An Additional network feature (ANF) is a capability, over and above that of a basic service, provided by a PISN, but not directly to a PISN 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 Call, basic call

A call or basic call is an instance of the use of a basic service.

4.2.4 Connected number

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

4.2.5 Call Deflection

Call deflection is the type of diversion invoked by a served user's request.

4.2.6 Call Deflection from Alert

Call Deflection from Alert (CDA) is the type of diversion invoked by a served user's request during the alerting phase of an incoming call.

4.2.7 Call Deflection Immediate

Call Deflection Immediate (CDI) is the type of diversion invoked by a served user's request immediately after the receipt of an incoming call.

4.2.8 Diversion

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

4.2.9 Diversion from Alert

Diversion from Alert is the type of diversion invoked from an alerting state.

NOTE - Diversion from Alert can occur as a result of the supplementary services CFNR and CD as specified in this standard.

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4.2.10 Diversion Immediate

Diversion Immediate is the type of diversion invoked prior to reaching the alerting state.

NOTE - Diversion Immediate can occur as a result of the supplementary services CFB, CFU and CD as specified in this standard.

4.2.11 Diverted-to number

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

4.2.12 Diverted-to subaddress

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

4.2.13 Diverted-to user

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

4.2.14 Diverting cause

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

4.2.15 Diverting number

The diverting number is the number of the served user.

4.2.16 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.

4.2.17 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.

4.2.18 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.

4.2.19 Original called number

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

4.2.20 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.

4.2.21 Partial rerouteing

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.

4.2.22 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 COLR supplementary service.

4.2.23 PISN number

A PISN number is a number belonging to a PISN numbering plan (E.164 ISDN/Private/Implicit numbering plan) specified in ISO/IEC 11571.

4.2.24 Private

An attribute indicating that the application of the so qualified item, e.g. a network, a unit of equipment, a service, is offered to or is in the interest of a determined set of users.

4.2.25 Public

An attribute indicating that the application of the so qualified item, e.g. a network, a unit of equipment, a service, is offered to the general public.

4.2.26 Public ISDN

A public telecommunication network which supports ISDN services between any two T-reference points.

4.2.27 Rerouteing

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.

4.2.28 Served user

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

4.2.29 Terminal, terminal equipment

An item of equipment attached to a telecommunication network to provide access for a user to one or more services.

4.2.30 User A

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

4.2.31 User B

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

4.2.32 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.

4.2.33 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
CC	Call Control (functional entity)
CCA	Call Control Agent (functional entity)
CDA	Call Deflection from Alert
CDI	Call Deflection Immediate
CLIP	Calling Line Identification Presentation
CLIR	Calling/Connected Line Identification Restriction
COLP	Connected Line Identification Presentation
CNIP	Calling Name Identification Presentation
CNIR	Calling/Connected Name Identification Restriction
CONP	Connected Name Identification Presentation
DTN	Diverted-to number
DIVA	Diversion from Alert
DIVI	Diversion Immediate
FE	Functional Entity
ISDN	Integrated Services Digital Network
MSN	Multiple Subscriber Number
NDUB	Network Determined User Busy
NSO	Notification Subscription Option
PISN	Private Integrated Services Network
PINX	Private Integrated Services Network Exchange
SDL	Specification and Description Language
SS-CD, CD	Call Deflection supplementary service
SS-CF, CF	Call Forwarding supplementary services
SS-CFB, CFB	Call Forwarding Busy supplementary service
SS-CFNR, CFNR	Call Forwarding No Reply supplementary service
SS-CFU, CFU	Call Forwarding Unconditional supplementary service
SS-DIV, DIV	Call Diversion supplementary services

TE Terminal Equipment
UDUB User Determined User Busy

6 SS-CFU stage 1 specification

6.1 Description

6.1.1 General 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.

CFU is provided on a per PISN number basis.

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.

6.1.2 Qualifications on applicability to telecommunication services

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

6.2 Procedures

6.2.1 Provision/withdrawal

Provision and withdrawal of CFU shall be by pre-arrangement with the service provider. CFU subscription shall be on a per PISN number basis. For each PISN number, the supplementary service may be subscribed to collectively for all basic services subscribed to at that PISN number or for only some of the basic services subscribed to at that PISN number.

The subscription parameters and values offered by a PISN are an implementation matter. A stage 3 standard shall support the parameters and values specified in table 1. A PISN may offer more or less parameters and values than those specified in table 1.

Parameters apply separately to each basic service subscribed to on each PISN number. For each subscription parameter only one value is selectable.

Table 1 - Subscription options

Subscription Parameter	Value
Served user receives notification that call has been diverted	- No - Yes
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

6.2.2 Normal procedures

6.2.2.1 Activation/deactivation/registration/interrogation

CFU may be either permanently activated or activated/deactivated under user control. If activation/deactivation is under user control, the PISN may optionally provide for activation/deactivation by the served user (local activation/deactivation), by another user (remote activation/ deactivation) or both.

The PISN may provide interrogation, which can be local, remote or both.

Registration of information is performed on activation of CFU. There are no separate registration procedures.

6.2.2.2 Local activation/deactivation

The served user shall be able to activate CFU separately for each basic service for which CFU is subscribed to and thereby request a different diverted-to number and/or subaddress for each basic service for which CFU is subscribed to, and/or shall be able to activate CFU for all basic services for which CFU is subscribed to.

To activate CFU, the served user shall supply:

1. the diverted-to number, which may be accompanied by a diverted-to subaddress;
2. information as to whether CFU is to apply to all basic services for which CFU is subscribed to or to a specified basic service out of the basic services for which CFU is subscribed to;
3. where there is more than one PISN number assigned to the access (i.e. in the context of an MSN arrangement), the PISN number for which CFU shall apply.

Verification that the diverted-to number exists and that the specified basic service is subscribed to at that number may be carried out before accepting the CFU activation request.

The service provider shall return notification of acceptance of the request. Notification of acceptance shall include the number of the diverted-to user to whom the CFU is active.

If a single number is used by more than one terminal, activation/deactivation of CFU shall be possible from any terminal which uses this number. When the served user has more than one compatible terminal for the basic service(s) specified at activation time, notification of successful activation/deactivation shall be sent to all the compatible terminals.

In the absence of any of the parameters in the activation procedure (e.g. the diverted-to number), default parameters already known to the PISN may be used.

It shall be possible to deactivate CFU by means of an explicit request for deactivation. An explicit request for deactivation shall be treated as follows:

- if deactivation of CFU for an individual basic service is requested, it shall be accepted only if CFU is already activated for that basic service and shall result in the discarding of the diverted-to number und diverted-to subaddress;
- if deactivation of CFU collectively for all basic services is requested, it shall result in the discarding of any diverted-to numbers und diverted-to subaddresses for individual basic services and any diverted-to number und diverted-to subaddress collectively for all basic services.

It shall be possible to deactivate CFU by activating CFU to a different diverted-to number and/or diverted-to subaddress. A request for activation of CFU when CFU is already activated shall be treated as follows:

- if activation of CFU for an individual basic service is requested, it shall be accepted only if CFU is not already activated collectively for all basic services and, if CFU is already activated for that individual basic service, shall result in the overwriting of the existing diverted-to number and diverted-to subaddress;
- if activation of CFU collectively for all basic services is requested, it shall result in the discarding of any existing diverted-to numbers and diverted-to subaddresses for individual basic services and the overwriting of any existing diverted-to number and diverted-to subaddress collectively for all basic services.

6.2.2.3 Remote activation/deactivation

Remote activation/deactivation of CFU shall use one or more of the following procedures:

1. A special authorized user may activate and/or deactivate CFU at the served user. Authorization shall be implementation dependent (e.g. attendants may be authorized).
2. A user may activate CFU at the served user such that the activating user becomes the diverted-to user, subject to the served user having remote activation enabled in advance. The intended diverted-to user shall be able to activate CFU regardless of whether CFU is already active. The served user may disable a remote activation at any time. If the disable procedure is performed whilst CFU is activated, the CFU shall not be automatically deactivated. The enable and disable procedure may be performed either by the served user or by an implementation specific entity.
3. The diverted-to user may deactivate CFU at the served user. This shall not be dependent on whether the served user has enabled remote activation. The diverted-to user shall lose this capability as soon as CFU is deactivated in this way, and shall not regain the capability if CFU is activated again to a different diverted-to user.
4. The diverted-to user, at the same time as deactivating CFU in accordance with item 3. above, may be able to activate CFU from the served user to another diverted-to user (i.e. change the destination of CFU). The diverted-to user shall lose this capability as soon as CFU is reactivated in this way. The new diverted-to user shall gain the capability.

When a remote activation/deactivation procedure is performed successfully, the served user and the activating/ deactivating user shall be notified. The notification to the served user shall include the number of the diverted-to user and the basic service.

It shall be possible, that the served user activates CFU and the remote user deactivates CFU and vice versa.

NOTE - The use of a password facility for remote activation as an implementation option is not excluded.

6.2.2.4 Local interrogation

If local interrogation is provided, a PISN shall support interrogation on a per number basis for all basic services and/or for a user specified basic service. Where there is more than one PISN number assigned to the access (i.e. in the context of an MSN arrangement), the user shall apply the PISN number for which interrogation of CFU is required. The PISN response to an interrogation request shall provide the following information to the user:

- activated or deactivated state of the supplementary service,
- if activated:
 - diverted-to number and, if applicable, diverted-to subaddress
 - whether activated for all basic services or an individual basic service and the identity of the individual basic service.

As additional information, the interrogation may provide information to the served user, whether remote activation has been enabled (allowed).

Where interrogation is for all basic services for which CFU is subscribed to and CFU has been activated separately for more than one basic service, the above information shall be repeated for each activation.

6.2.2.5 Remote interrogation

If remote interrogation is provided, it shall be possible from one or both of the following remote users:

1. A special authorized user may interrogate CFU conditions on the served user. Authorization shall be implementation dependent (e.g. attendants may be authorized).
2. The diverted-to user may interrogate CFU at the served user.

The remote interrogation request and response shall include the information as specified for local interrogation and additionally the PISN number of the served user.

6.2.3 Invocation and operation

All incoming calls indicating a basic service for which CFU is active shall be diverted without being presented to the served user.

6.2.3.1 Served user notification

The served user, as a subscription option, may receive notification of the diversion (but will not be able to answer the incoming call). This notification shall be given as soon as the PISN originates the call to the diverted-to user and shall include the following information (on the call that has been diverted):

1. Indication that a call has been forwarded and the reason (CFU);
2. Bearer Capability information and, if available, High Layer Compatibility information and Low Layer Compatibility information;
3. User B's number (applicable in the context of an MSN arrangement);

If a previous diversion has occurred, the notification shall include in addition:

4. last diverting user's number, if presentation is permitted by the last diverting user;
5. cause for last diversion.

If more than one previous diversion has occurred, the notification shall also include:

6. original called user's number, if presentation is permitted by the original called user;
7. cause for original diversion

6.2.3.2 Diverted-to user notification

The diverted-to user shall receive an indication that the call has been diverted with the appropriate diversion cause. According to the served user's subscription option, the diverted-to user may receive the served user's number.

If multiple diversion has occurred, the diverted-to user may receive the original called user's number and the last diverting user's number, according to subscription options at those two users. When multiple diversion occurs, the diverted-to user may receive the reason for the original diversion as well as for the last diversion.

The notification to the diverted-to user may, provided the subscription options allow, additionally include the identification of the served user's name (in case of multiple diversion the name of the original called user and of the last diverting user).

6.2.3.3 Calling user notification

As a subscription option of the served user, the calling user may receive a notification that the call has been diverted and as an additional option that notification may include the diverted-to user's number.

For single diversion, notifications shall be sent to the calling user depending on the subscription option of the served user as follows:

- If "No", no notification shall be sent to User A.
- If "Yes, without diverted-to number/name", a notification without number/name shall be sent to User A.
- If "Yes, with diverted-to number/name", a notification with User C's number and optionally the User C's name shall be sent to User A if CLIR/CNIR is not invoked by User C.

For multiple diversions, notifications shall be sent to the calling user depending on the subscription options of the served users as follows:

- If user B1 has "No", no notification shall be sent to User A.
- If user B1 does not have "No", a notification shall be sent to User A as a result of the diversion at user B1. Diversions at successive served users B2, B3, etc. each shall also result in a notification to User A, but only if both
 - the alerting state has been reached at the served user, and
 - none of the served users has the "No" option.

The number and optionally the name of User C shall be sent to User A, but only if both

- all served users have "Yes, with diverted-to number/name", and
- CLIR/CNIR is not invoked by User C.

In addition, the number and optionally the name of a user B_n may be sent to User A, if the alerting state has been reached at user B_n, if all users B1 to B_{n-1} have "Yes, with diverted-to number/name", and if there is no possibility of CLIR/CNIR being invoked at user B_n.

6.2.4 Exceptional procedures

6.2.4.1 Activation/deactivation

If the PISN cannot accept an activation request, the activating user shall receive a notification that CFU activation was unsuccessful. Possible causes for rejection are e.g:

- service or option not subscribed to,
- insufficient information,
- diverted-to number is a special service code (e.g. police),
- diverted-to number is the served user's number,
- diverted-to number is an invalid PISN number,
- basic service to which relevance is requested is not subscribed to,
- incorrect served user's number.

If the PISN cannot accept a deactivation request, the deactivating user shall receive a notification that CFU deactivation was unsuccessful. Possible causes for rejection are e.g.:

- service or option not subscribed to,
- insufficient information,
- service not activated,
- incorrect served user's number.

In case of remote activation/deactivation the notification of an unsuccessful activation/deactivation request shall be sent to the activating/deactivating user only.

6.2.4.2 Interrogation

If the PISN cannot accept an interrogation request, the interrogating user shall receive a notification that CFU interrogation was unsuccessful. Possible causes for rejection are e.g.:

- service or option not subscribed to,
- insufficient information,
- basic service to which relevance is requested is not subscribed to.

6.2.4.3 Invocation and operation

CFU shall not be invoked on a call to the served user if the call uses a basic service for which CFU has not been activated.

In cases where a calling user normally receives, as part of notification, the number of the diverted-to user, the last diverting user or the original called user and this number is unavailable (e.g. due to number presentation restriction, or interworking), the user who would have been given the number shall receive an indication of the reason why no number is given.

In cases where a calling user normally receives, as part of notification, the name of the diverted-to user, the last diverting user or the original called user and this name is unavailable (e.g. due to name presentation restriction, or interworking), the user who would have been given the name shall receive an indication of the reason why no number is given.

Within a PISN the total number of all diversions for each call shall be limited. The maximum number of such diversions for each call shall be an implementation option. When counting the number of diversions, all types of diversions shall be included. If the limit is reached and an attempt is made to divert the call an additional time, either the calling user shall receive call clearing with an appropriate cause or further diversions shall be overridden by offering the call to the served user.

If the diverted call cannot be completed to the diverted-to destination, then the PISN shall clear the call. Specifically, if CFU has been invoked and CFNR has not occurred previously during the call setup, then the call shall be cleared back towards the calling user and to the calling user shall be sent an indication that the call cannot be completed. This indication shall not reveal that the call has been diverted. If CFNR has previously occurred, then the procedures for the failure of CFNR shall apply.

The diversion may be overridden for specific calls, e.g. calls from the diverted-to user to the diverting user. The conditions for this shall be implementation specific.

6.3 Interactions with other supplementary services and ANFs

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

6.3.1 Calling Line Identification Presentation (CLIP)

Served user: If subscribed to, the served user shall receive, as part of the served user notification of diversion, the Calling Line Identification of the diverted call, unless CLIR applies and the served user has no override capability.

Diverted-to users, who have subscribed to CLIP shall receive the calling user's number unless CLIR applies and the diverted-to user has no override capability.

6.3.2 Connected Line Identification Presentation (COLP)

If the served user, or any served user in the case of multiple diversions, subscribes to the option that the calling user is not notified of diversion, then the calling user shall not be provided with COLP, unless the calling user has override capability.

If the served user, or any served user in the case of multiple diversions, subscribes to the option that the calling user is notified, but without the diverted-to user number, then the calling user shall not be provided with COLP, unless the calling user has an override capability.

6.3.3 Calling/Connected Line Identification Restriction (CLIR)

When diversion occurs, the number of a calling PISN user which has invoked CLIR, shall not be presented to the diverting user or the diverted-to user, unless the diverting user or diverted-to user has the service profile to override this restriction.

A diverted-to user which has invoked CLIR shall not have its number presented to the calling user, either as CONP or as part of a notification of diversion, unless the calling user has an override service profile. A diverted-to user which is provided with CLIR temporary mode shall not have its identity revealed to the calling user as part of a notification of call diversion until the diverted-to user has responded and it is known that restriction is not to be invoked, unless the calling user has an override service profile.

NOTE - The diverted-to user's number can still be released on answer, after confirmation, or using the default.

In each of the above situations, a calling user that subscribes to COLP and who has override capability shall not be able to receive the diverted-to user's number as part of the diverting notification information, but can invoke COLP with override in order to receive the connected line identity when the call is answered.

6.3.4 Calling Name Identification Presentation (CNIP)

Diverted-to users who have subscribed to CNIP shall receive the calling user's name unless CNIR has been invoked and the diverted-to user has no override capability. In addition, unless restriction applies and the served user has no override capability, the served user (or users if the call is diverted more than once) shall receive the name of the calling user as part of any notification to the served user that a call has been diverted.

6.3.5 Connected Name Identification Presentation (CONP)

If the served user, or any served user in the case of multiple diversions, subscribes to the option that the calling user is not notified of diversion, then the calling user shall not be provided with CONP, unless the calling user has override capability.

If the served user, or any served user in the case of multiple diversions, subscribes to the option that the calling user is notified, but without the diverted-to user number/name, then the calling user shall not be provided with CONP, unless the calling user has an override capability.

In all other cases, the provision of the diverted-to user's name shall be in accordance with CONP.

6.3.6 Calling/Connected Name Identification Restriction (CNIR)

When diversion occurs, the name of a calling PISN user which has invoked CNIR shall not be presented to the diverting user or the diverted-to user, unless the diverting user or diverted-to user has the service profile to override this restriction.

A diverted-to user which has invoked CNIR shall not have its name presented to the calling user, either as CONP or as part of a notification of diversion, unless the calling user has an override service profile. A diverted-to user which is provided with CNIR temporary mode shall not have its identity revealed to the calling user as part of a notification of call diversion until the diverted-to user has responded and it is known that restriction is not to be invoked, unless the calling user has an override service profile.

NOTE - The invocation of CNIR at the diverting user has no impact on Call Diversion.

6.3.7 Completion of Calls to Busy Subscriber (CCBS)

If the call to User B is diverted to User C by CFU and User C is busy, then a CCBS request from User A shall be applied to the diverted-to User C.

If User B activates CFU after User A has requested CCBS and whilst the CCBS recall has not yet been accepted by User A, then the CCBS request shall either continue to be applied to User B or be cancelled.

If a user invokes CCBS whilst CFU is activated, or a user invokes CCBS and subsequently activates CFU, CCBS Recall shall still be given to that user.

6.3.8 Completion of Calls on No Reply (CCNR)

If the call to User B is diverted to User C by CFU and User C does not answer, then a CCNR request from User A shall be applied to the diverted-to User C.

If User B activates CFU after User A has requested CCNR and whilst the CCNR recall has not yet been accepted by User A, then the CCNR request shall either continue to be applied to User B or be cancelled.

If a user invokes CCNR whilst CFU is activated, or a user invokes CCNR and subsequently activates CFU, CCNR Recall shall still be given to that user.

6.3.9 Call Transfer (CT)

No interaction.

6.3.10 Call Forwarding Busy (CFB)

The invocation of CFU shall take precedence over CFB.

6.3.11 Call Forwarding No Reply (CFNR)

The invocation of CFU shall take precedence over CFNR.

6.3.12 Call Deflection (CD)

No interaction.

6.3.13 Path Replacement (PR)

No interaction.

6.4 Interworking considerations

Interworking with other networks is optional. When interworking with another network, the implementation specific limit of the total number of known diversions for each call shall still apply.

Where a remote user is on a different network, notifications to the remote user, if applicable, shall be sent to the remote user's network for delivery to the remote user. Numbers included in this information shall be provided as required for the other network.

If the private network detects diversion back to a destination in the public network, the private network may request that diversion is performed by the public network.

The PISN may activate, deactivate and interrogate CFU in the public ISDN on behalf of a PISN user.

7 SS-CFB stage 1 specification

7.1 Description

7.1.1 General description

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.

CFB is provided on a per PISN number basis.

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.

7.1.2 Qualifications on applicability to telecommunication services

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

7.2 Procedures

7.2.1 Provision/withdrawal

6.2.1 shall apply with "CFU" replaced by "CFB".

7.2.2 Normal procedures

7.2.2.1 Activation/deactivation/registration/interrogation

6.2.2.1 shall apply with "CFU" replaced by "CFB".

7.2.2.2 Invocation and operation

All incoming calls indicating a basic service for which CFB is active shall be diverted if the served user is busy.

7.2.2.2.1 Served user notification

6.2.2.2.1 shall apply with "CFU" replaced by "CFB".

7.2.2.2.2 Diverted-to user notification

6.2.2.2.2 shall apply.

7.2.2.2.3 Calling user notification

6.2.2.2.3 shall apply.

7.2.3 Exceptional procedures

6.2.3 shall apply with "CFU" replaced by "CFB".

7.3 Interactions with other supplementary services and ANFs

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

7.3.1 Calling Line Identification Presentation (CLIP)

6.3.1 shall apply.

7.3.2 Connected Line Identification Presentation (COLP)

6.3.2 shall apply.

7.3.3 Calling/Connected Line Identification Restriction (CLIR)

6.3.3 shall apply.

7.3.4 Calling Name Identification Presentation (CNIP)

6.3.4 shall apply.

7.3.5 Connected Name Identification Presentation (CONP)

6.3.5 shall apply. In addition, as an implementation option, if User C is also busy, the original user's name may be presented to the calling user instead of the user's C name.

7.3.6 Calling/Connected Name Identification Restriction (CNIR)

6.3.6 shall apply.

7.3.7 Completion of Calls to Busy Subscriber (CCBS)

If the call to User B is diverted to User C by CFB and User C is busy, then a CCBS request from User A shall be applied either to the diverted-to User C or to the originally called User B.

If User B activates CFB after User A has requested CCBS and whilst the CCBS recall has not yet been accepted by User A, then the CCBS request shall continue to be applied to User B.

If a user invokes CCBS whilst CFB is activated, or a user invokes CCBS and subsequently activates CFB, this shall not affect the provision of the CCBS recall to that user.

7.3.8 Completion of Calls on No Reply (CCNR)

If the call to User B is diverted to User C by CFB and User C does not answer, then a CCNR request from User A shall be applied to the diverted-to User C.

If User B activates CFB after User A has requested CCNR and whilst the CCNR recall has not yet been accepted by User A, then the CCNR request shall continue to be applied to User B.

If a user invokes CCNR whilst CFB is activated, or a user invokes CCNR and subsequently activates CFB, this shall not affect the provision of the CCNR recall to that user.

7.3.9 Call Transfer (CT)

No interaction.

7.3.10 Call Forwarding Unconditional (CFU)

The invocation of CFU shall take precedence over CFB.

7.3.11 Call Forwarding No Reply (CFNR)

No interaction.

7.3.12 Call Deflection

No interaction.

NOTE - In case of NDUB (Network Determined User Busy) the call is not presented to the user, and thus CFB takes precedence over CD. If an NDUB condition is not met, the incoming call is presented to the called user and invocation of either CFB or CD depends on the user's response.

7.3.13 Path Replacement (PR)

No interaction.

7.4 Interworking Considerations

6.4 shall apply with "CFU" replaced by "CFB".

8 SS-CFNR stage 1 specification**8.1 Description****8.1.1 General description**

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.

CFNR is provided on a per PISN number basis.

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.

8.1.2 Qualifications on applicability to telecommunication services

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

8.2 Procedures**8.2.1 Provision/withdrawal**

6.2.1 shall apply with "CFU" replaced by "CFNR".

8.2.2 Normal procedures

8.2.2.1 Activation/deactivation/registration/interrogation

6.2.2.1 shall apply with "CFU" replaced by "CFNR".

8.2.2.2 Invocation and operation

All incoming calls indicating a basic service for which CFNR is active shall be diverted if the served user does not reply within a specified time interval.

The original call shall continue to alert the served user, who shall still be able to accept the call until the call to the diverted-to user has reached an alerting state.

8.2.2.2.1 Served user notification

6.2.2.2.1 shall apply with "CFU" replaced by "CFNR".

8.2.2.2.2 Diverted-to user notification

6.2.2.2.2 shall apply.

8.2.2.2.3 Calling user notification

6.2.2.2.3 shall apply.

8.2.3 Exceptional Procedures

8.2.3.1 Activation/Deactivation

6.2.3.1 shall apply with "CFU" replaced by "CFNR".

8.2.3.2 Interrogation

6.2.3.3 shall apply.

8.2.3.3 Invocation and operation

CFNR shall not be invoked on a call to the served user if the call uses a basic service for which CFNR has not been activated.

In cases where a user normally receives, as part of notification, the number of the diverted-to user, the last diverting user or the original called user and this number is unavailable (e.g. due to number presentation restriction, or interworking), the user who would have been given the number shall receive an indication of the reason why no number can be given.

Within a PISN the total number of all diversions for each call shall be limited. The maximum number of such diversions for each call shall be an implementation option. When counting the number of diversions, all types of diversions shall be included. If the limit is reached and an attempt is made to divert the call an additional time, the diversion shall not take place.

If the diverted call cannot be completed to the diverted-to destination, then the PISN shall clear the diverted leg of the call and continue to alert the diverting user. If the diverting user has already been notified of CFNR, then that user shall be notified of failure of CFNR.

The call diversion may be overridden for specific calls, e.g. calls from the diverted-to user to the diverting user. The conditions for this shall be implementation specific.

8.3 Interactions with other supplementary services and ANFs

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

8.3.1 Calling Line Identification Presentation (CLIP)

Diverted-to users, who have subscribed to CLIP shall receive the calling user's number unless CLIR applies and the diverted-to user has no override capability.

NOTE - If subscribed to, the served (diverting) user receives the Calling Line Identification of all calls, unless CLIR applies and the served user has no override capability.

8.3.2 Connected Line Identification Presentation (COLP)

6.3.2 shall apply.

8.3.3 Calling/Connected Line Identification Restriction (CLIR)

6.3.3 shall apply.

8.3.4 Calling Name Identification Presentation (CNIP)

Diverted-to users, who have subscribed to CNIP shall receive the calling user's name unless CNIR has been invoked and the diverted-to user has no override capability.

NOTE - If subscribed to, the served (diverting) user receives the Calling Name Identification of all calls, unless CNIR applies and the served user has no override capability.

8.3.5 Connected Name Identification Presentation (CONP)

If the served user subscribes to the option that the calling user is not notified of call diversion, then the calling user shall not be provided with CONP, unless the calling user has override capability.

If the served user subscribes to the option that the calling user is notified, but without the diverted-to user number/name, then the calling user shall not be provided with CONP, unless the calling user has an override capability.

In all other cases, the provision of the diverted-to user's name on answer shall be in accordance with CONP. The diverted-to user's name shall not be provided on commencement of alerting.

8.3.6 Calling/Connected Name Identification Restriction (CNIR)

6.3.6 shall apply.

8.3.7 Completion of Calls to Busy Subscriber (CCBS)

If User B activates CFNR after User A has requested CCBS and whilst the CCBS recall has not yet been accepted by User A, then the CCBS request shall continue to be applied to User B.

NOTE - In such a case, the call resulting from successful completion of CCBS can be subject to CFNR if not answered.

If a user invokes CCBS whilst CFNR is activated, or a user invokes CCBS and subsequently activates CFNR, this shall not affect the provision of the CCBS recall to that user.

8.3.8 Completion of Calls on No Reply (CCNR)

If the call to User B is diverted to User C by CFNR and User C does not answer, then a CCNR request from User A shall be applied to either User B or User C.