

INTERNATIONAL STANDARD

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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Path replacement additional network feature

*Technologies de l'information — Télécommunications et échange
d'information entre systèmes — Réseau privé à intégration de
services — Spécification, modèle fonctionnel et flux d'informations —
Facilité de réseau additionnelle de remplacement de chemin*



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Foreword

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

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 13863 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

Annexes A and B of this International Standard are for information only.

Introduction

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

This particular International Standard specifies the Path Replacement additional network feature.

Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Path replacement additional network feature

1 Scope

This International Standard specifies the Path Replacement additional network feature (ANF-PR), which is applicable to various basic services supported by Private Integrated Services Networks (PISN). Basic services are specified in ISO/IEC 11574.

ANF-PR is a feature which applies to an established call, allowing that call's connection between Private Integrated Services Network Exchanges (PINXs) to be replaced by a new connection. If the new connection is required to satisfy certain criteria, ANF-PR should be used in conjunction with other supplementary services and/or ANFs. Annex A gives examples of the circumstances under which ANF-PR can be used and criteria which can govern the selection of the new connection.

Additional network feature specifications are produced in three stages, according to the method described in CCITT Recommendation I.130 for supplementary services. This International Standard contains the stage 1 and stage 2 specifications of ANF-PR. The stage 1 specification (clause 6) specifies the feature as seen by an entity which initiates path replacement, the ANF-PR user. The stage 2 specification (clauses 7 and 8) identifies the functional entities involved in the feature and the information flows between them. Clause 7 contains the stage 2 specification for basic operation of the feature. Clause 8 contains the stage 2 specification for an enhanced mode of working which can be employed when supported by all the equipment involved. It allows some of the elements of the old connection to be re-used.

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 feature 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 clause 6 (stage 1) and clauses 7 and 8 (stage 2) which are relevant to the interface or equipment to which the Stage 3 International Standard applies.

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 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)
- Private Integrated Services Network (PISN) (ISO/IEC 11579-1)
- Private Integrated Services Network Exchange (PINX) (ISO/IEC 11579-1)
- Service (CCITT Rec. I.112)
- Signalling (CCITT Rec. I.112)
- Supplementary Service (CCITT Rec. I.210)
- User (except in the context of ANF-PR 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:

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

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

- Destination Number.

4.2 Other definitions

4.2.1 additional network feature (ANF): A capability, over and above that of a basic service, provided by a PISN, but not directly to a PISN user

4.2.2 ANF-PR user: An entity, within a PISN, that requests ANF-PR.

4.2.3 call, basic call: An instance of the use of a basic service.

4.2.4 connection: As defined in CCITT Rec. I.112, but limited to the case of providing for the transfer of signals between two PINXs.

NOTE 1 — A connection between two PINXs can pass through zero or more Transit PINXs.

4.2.5 new connection: The connection established by ANF-PR and used to replace all or part of the old connection.

4.2.6 old connection: The connection existing before ANF-PR is invoked.

4.2.7 trombone connection: A connection which has both its ends in the same PINX but which involves at least one Transit PINX.

5 List of acronyms

ANF	additional network feature
ANF-PR	ANF Path Replacement
CC	Call Control (functional entity)
CCA	Call Control Agent (functional entity)
CID	Call Identity (information flow service element)
FE	Functional Entity
ISDN	Integrated Services Digital Network
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
PRE	Path Replacement Error (information flow)
PRP	Path Replacement Propose (information flow)
PRR	Path Replacement Re-use (information flow)
PRRR	PRR Result (information flow service element)
PRS	Path Replacement Setup (information flow)
PRSR	PRS Result (information flow service element)
RN	Rerouting Number (information flow service element)
SDL	Specification and Description Language

6 ANF-PR stage 1 specification

6.1 Description

6.1.1 General description

ANF-PR is invoked by an ANF-PR user for an established call, allowing that call's connection through the PISN to be replaced by a new connection. If the new connection is required to satisfy certain criteria, ANF-PR should be used in conjunction with other supplementary services and/or ANFs. Annex A gives examples of the circumstances under which ANF-PR can be used and criteria which can govern the selection of the new connection.

6.1.2 Qualifications On Applicability To Telecommunication Services

This additional network feature is applicable to all basic services defined in ISO/IEC 11574.

NOTE 2 — For certain teleservices or certain applications of certain basic bearer services the changeover from the old connection to the new connection can cause unacceptable disruption. See annex B.

6.2 Procedure

6.2.1 Provision/withdrawal

This ANF shall be PISN instigated.

NOTE 3 — Means can be provided for preventing the use of ANF-PR for applications where the changeover from the old connection to the new connection is likely to cause unacceptable disruption. See annex B.

6.2.2 Normal procedures

6.2.2.1 Activation/deactivation/registration/interrogation

The feature shall be permanently activated.

6.2.2.2 Invocation and operation

Invocation shall be on request from an ANF-PR user and shall be permitted only after a call has reached the active state.

On invocation an attempt shall be made to establish a new connection between the Originating PINX and the Terminating PINX. In the absence of specific criteria, the new connection shall be established using the routing rules which apply to basic call establishment. If the new connection is successfully established it shall be used to replace the old connection, which shall be released.

Changeover from the old connection to the new connection should be done in a manner which minimises disruption to user information.

NOTE 4 — The means of specifying criteria and ensuring that the new connection satisfies those criteria can involve the use of another ANF or supplementary service, which can be either standardised or manufacturer specific.

In some circumstances it may be possible to re-use some elements of the old connection, so that only part of the old connection has to be replaced by a new connection, subject to the given criteria being achievable in that way.

6.2.3 Exceptional procedures

6.2.3.1 Activation/deactivation/registration/interrogation

Not applicable.

6.2.3.2 Invocation and operation

If it is not possible to establish a new connection, the call shall continue to use the old connection and any resources reserved for the new connection shall be released. There shall be no disruption to user information.

In the event of two ANF-users (at opposite ends of the connection) requesting the feature simultaneously, both requests shall be rejected.

NOTE 5 — An ANF-PR user can request the feature again later in the event of failure. In the case of failure due to simultaneous requests, care should be taken to avoid a repeat occurrence, e.g., by use of a random delay.

6.3 Interaction 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 (SS-CLIP)

No interaction.

6.3.2 Connected Line Identification Presentation (SS-COLP)

No interaction.

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

No interaction.

6.3.4 Calling Name Identification Presentation (SS-CNIP)

No interaction.

6.3.5 Connected Name Identification Presentation (SS-CONP)

No interaction.

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

No interaction.

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

No interaction

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

No interaction

6.3.9 Call Transfer (SS-CT)

If call transfer occurs while ANF-PR is in progress, ANF-PR shall be aborted.

ANF-PR can apply to a call which has been transferred. The fact that transfer has occurred can be a reason for invoking ANF-PR (see annex A).

6.3.10 Call Forwarding Unconditional (SS-CFU)

ANF-PR can apply to a call which has been forwarded.

6.3.11 Call Forwarding Busy (SS-CFB)

ANF-PR can apply to a call which has been forwarded.

6.3.12 Call Forwarding No Reply (SS-CFNR)

ANF-PR can apply to a call which has been forwarded.

6.3.13 Call Deflection (SS-CD)

ANF-PR can apply to a call which has been deflected.

6.4 Interworking considerations

The requirements below apply to both incoming calls and outgoing calls.

It shall be possible to use ANF-PR on the PISN part of the connection. The new connection through the PISN shall replace the old connection through the PISN.

When interworking with another network which supports an equivalent feature, it may be possible to cooperate with the other network in order to replace the entire connection.

6.5 Overall SDL

Figure 1 contains the dynamic description of ANF-PR using the Specification and Description Language (SDL) defined in CCITT Rec. Z.100 (1988). The SDL process represents the behaviour of the PISN in providing ANF-PR. Input signals from the left and output signals to the left represent primitives from and to the ANF-PR user.

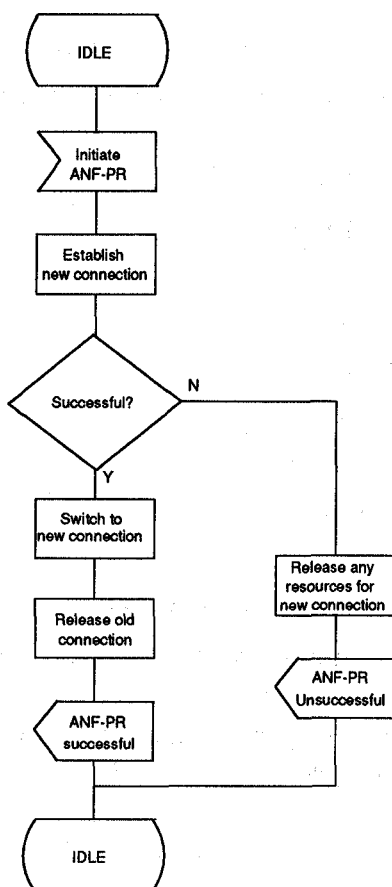


Figure 1 - ANF-PR, overall SDL

7 ANF-PR stage 2 specification - basic operation

7.1 Functional model

7.1.1 Functional model description

The functional model shall comprise the following functional entities:

FE1 Path Replacement Destination;

FE2 Path Replacement Source.

The following functional relationship shall exist between these FEs:

rx between FE1 and FE2.

Figure 2 shows these FEs and this relationship.

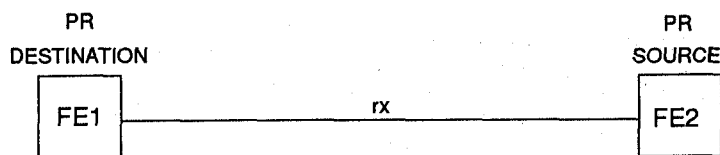


Figure 2 - Functional model for ANF-PR

7.1.2 Description of functional entities

7.1.2.1 Path Replacement destination functional entity, FE1

This functional entity receives a request from the ANF-PR user to initiate ANF-PR and instructs FE2 to attempt to establish a new connection back towards FE1. If the new connection is successfully established, FE1 switches to the new connection and awaits the release of the old connection.

7.1.2.2 Path Replacement source functional entity, FE2

On receipt of instruction from FE1 and if able to proceed with ANF-PR, this functional entity initiates the establishment of a new connection back towards FE1. If the new connection is successfully established, FE2 switches to the new connection and initiates release of the old connection.

7.1.3 Relationship of functional model to basic call functional model

During successful invocation of ANF-PR, the Transit CCs, if any, involved in the old connection shall be replaced by the Transit CCs, if any, involved in the new connection. The Originating and Terminating CCs shall remain.

For the case of a call originating and terminating within the PISN, ANF-PR functional entities shall be related to basic call functional entities as follows:

- FE1 shall be collocated with the Originating CC or the Terminating CC, depending on the location of the ANF-PR user;
- FE2 shall be collocated with the Terminating CC if FE1 is collocated with the Originating CC, or with the Originating CC if FE1 is collocated with the Terminating CC.

Figure 3 shows an example of the relationship between the model for ANF-PR and the model for the basic call. This example is used as the basis of the information flow sequences in 7.2.3.

NOTE 6 — The number of Transit CCs on the new connection can differ from the number on the old connection.

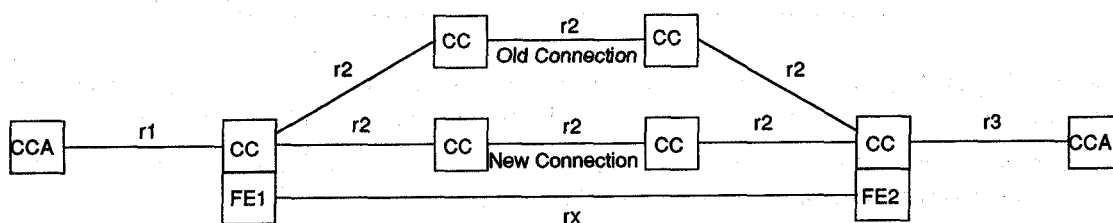


Figure 3 - Example relationship between models for ANF-PR and basic call

7.2 Information flows

7.2.1 Definition of information flows

In the tables listing the service elements in information flows, the column headed "Request" indicates which of these service elements are mandatory (M) and which are optional (O) in a request/indication information flow, and the column headed "Confirm" indicates which of these service elements are mandatory (M) and which are optional (O) in a response/confirmation information flow.