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Foreword

This European Telecommunication Standard (ETS) has been produced by the European Computer Manufacturers Association (ECMA) on behalf of its members and those of the European Telecommunications Standards Institute (ETSI).

This ETS is one of a series of standards defining services and signalling protocols applicable to Private Telecommunication Networks (PTNs). The series uses the ISDN concepts as developed by CCITT and is also within the framework of standards for open systems interconnection as defined by ISO.

This particular ETS specifies the signalling protocol for use at the Q reference point in support of the Path Replacement additional network feature.

The ETS is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO, CCITT, ETSI and other international and national standardisation bodies. It represents a pragmatic and widely based consensus.

This ETS was produced by ECMA using the ECMA guidelines for the production of standards and using the ECMA stylesheet. In order to avoid undue delays in the voting process for this ETS it has been agreed that this ETS will not be converted to the ETSI stylesheet.

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1 Scope

This ETS specifies the signalling protocol for the support of the Path Replacement additional network feature (ANF-PR) at the Q reference point between Private Telecommunication Network Exchanges (PTNXs) connected together within a Private Telecommunication Network (PTN).

ANF-PR is a feature which applies to an established call, allowing that call's connection through the PTN to be replaced by a new connection.

The Q reference point is defined in ENV 41004. This ETS contains the stage 3 specification for the Q reference point and satisfies the requirements identified by the stage 1 and stage 2 specifications in prETS 300 258.

Service specifications are produced in three stages and according to the method specified in ENV 41005.

The signalling protocol for ANF-PR operates on top of the signalling protocol for basic circuit switched call control, as specified in ETS 300 172, and uses certain aspects of the generic procedures for the control of supplementary services specified in ETS 300 239.

The impact on the protocol of interactions between the ANF specified in this ETS and other supplementary services and ANFs is outside the scope of this ETS.

This ETS is applicable to PTNXs which can interconnect to form a PTN.

2 Conformance

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

3 References

ENV 41004 Reference configuration for connectivity relations of private telecommunication network exchanges (1989).

ENV 41005 Method for the specification of basic and supplementary services of private telecommunication networks (1989).

ENV 41007 Definition of terms in private telecommunication networks (1989).

ETS 300 171 Private Telecommunication Network (PTN); Specification, functional models and information flows, Control aspects of circuit mode basic services (1992).

ETS 300 172 Private Telecommunication Network (PTN); Inter-exchange signalling protocol, Circuit mode basic services (1992).

ETS 300 189 Private Telecommunication Network (PTN); Addressing (1992).

ETS 300 196 ISDN - Generic Functional Protocol for the Support of Supplementary Services - DSS1 Protocol

ETS 300 239 Private Telecommunication Network (PTN); Signalling between private telecommunication exchanges, Generic functional protocol for the support of supplementary services (1993).

prETS 300 258 Private Telecommunication Networks (PTN); Specification, functional models and information flows, Path replacement additional network feature (1993).

prETS 300 261 Private Telecommunication Networks (PTN); Inter-exchange signalling protocol, Call transfer supplementary service (1993).

CCITT Recommendation I.112 Vocabulary of terms for ISDNs (1988).

CCITT Recommendation I.210 Principles of telecommunication services supported by an ISDN and the means to describe them (1988).

CCITT Recommendation Z.100 Specification and description language (1988).

4 Definitions

For the purpose of this ETS the following definitions apply.

4.1 External definitions

This ETS uses the following terms defined in other documents:

- ANF-PR user (prETS 300 258);
- Application Protocol Data Unit (APDU) (ETS 300 239);
- Basic Service (CCITT Recommendation I.210);
- Call, Basic Call (ETS 300 239);
- Connection (prETS 300 258);
- Incoming Gateway PTNX (ETS 300 172);
- Interpretation APDU (ETS 300 239);
- Network Facility Extension (NFE) (ETS 300 239);
- New Connection (prETS 300 258);
- Old Connection (prETS 300 258);
- Originating PTNX (ETS 300 172);
- Outgoing Gateway PTNX (ETS 300 172);
- Private (ENV 41007);
- Private Telecommunication Network Exchange (PTNX) (ENV 41007);
- Public ISDN (ENV 41007);
- Signalling (CCITT Recommendation I.112);
- Supplementary Service (CCITT Recommendation I.210);
- Supplementary Services Control Entity (ETS 300 239);
- Telecommunication Network (ENV 41007);
- Terminating PTNX (ETS 300 172);
- Transit PTNX (ETS 300 172);
- Trombone Connection (prETS 300 258);
- User (except in the context of ANF-PR user) (ETS 300 171).

4.2 Branching PTNX

The Transit PTNX at which the retained connection finishes and the new connection starts.

4.3 Co-operating PTNX

The End PTNX which initiates the establishment of the new connection towards other End PTNX involved in the call.

4.4 End PTNX

Within the context of a call, a PTNX which is not acting as a Transit PTNX, i.e. an Originating PTNX, a Terminating PTNX, an Incoming Gateway PTNX or an Outgoing Gateway PTNX.

4.5 Preceding PTNX

The adjacent PTNX in the direction of the Co-operating PTNX, relative to a particular PTNX involved in the old connection.

NOTE 1

This can be the Co-operating PTNX itself or a Transit PTNX.

4.6 Replaced connection

That part of the old connection which is not retained and is replaced by the new connection.

4.7 Requesting PTNX

The End PTNX which invokes ANF-PR and towards which the new connection is routed.

4.8 Retained connection

That part of the old connection which is retained and not replaced by the new connection.

4.9 Subsequent PTNX

The adjacent PTNX in the direction of the Requesting PTNX, relative to a particular PTNX involved in the old connection.

NOTE 2

This can be the Requesting PTNX itself or a Transit PTNX.

5 List of acronyms

ANF	Additional Network Feature
ANF-PR	Path Replacement Additional Network Feature
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation no. 1
ISDN	Integrated Services Digital Network
NFE	Network Facility Extension
PICS	Protocol Implementation Conformance Statement
PTN	Private Telecommunication Network
PTNX	Private Telecommunication Network Exchange
SDL	Specification and Description Language

6 Signalling protocol for the support of ANF-PR

6.1 ANF-PR description

ANF-PR is invoked by an ANF-PR user for an established call, allowing that call's connection through the PTN 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. In the absence of specific criteria, the new connection should be established using the routing rules which apply to basic call establishment.

NOTE 3

Annex A of prETS 300 258 gives examples of the circumstances under which ANF-PR can be used and criteria which can govern the selection of the new connection.

The Requesting PTNX shall request the Co-operating PTNX to attempt the establishment of a new connection from the Co-operating PTNX to the Requesting PTNX. If successful, the new connection shall replace the old connection.

NOTE 4

The Requesting PTNX can be either End PTNX involved in a call, i.e. the Originating PTNX or the Terminating PTNX or, in the case of interworking with another network, the Incoming Gateway PTNX or Outgoing Gateway PTNX.

Optional procedures and coding are specified for allowing the retention of one or more elements of the old connection, starting from the Co-operating PTNX and continuing as far as a Transit PTNX, subject to any given criteria being achievable in that way. A new connection is established from the Transit PTNX to the Requesting PTNX instead of from the Co-operating PTNX to the Requesting PTNX.

6.2 ANF-PR operational requirements

6.2.1 Requirements on the Co-operating PTNX

ANF-PR shall be applicable to a call whose protocol control state, as defined in ETS 300 172, is Active.

NOTE 5

State Active will have been reached as a result of ETS 300 172 call establishment procedures, possibly in conjunction with supplementary service and/or ANF procedures.

ETS 300 172 protocol control procedures for call establishment at the outgoing side of an inter-PTNX link shall apply to the establishment of the new connection. ETS 300 172 protocol control procedures for call clearing shall apply to the release of the old connection in the event of successful switch over to the new connection.

Generic procedures for the call-related control of supplementary services, as specified in ETS 300 239 for an End PTNX, shall apply.

6.2.2 Requirements on the Requesting PTNX

ANF-PR shall be applicable to a call whose protocol control state, as defined in ETS 300 172, is Active.

NOTE 6

State Active will have been reached as a result of ETS 300 172 call establishment procedures, possibly in conjunction with supplementary service and/or ANF procedures.

ETS 300 172 protocol control procedures for call establishment at the incoming side of an inter-PTNX link shall apply to the establishment of the new connection. ETS 300 172 protocol control procedures for call clearing shall apply to the release of the old connection in the event of successful switch over to the new connection.

Generic procedures for the call-related control of supplementary services, as specified in ETS 300 239 for an End PTNX, shall apply.

6.2.3 Requirements on a Transit PTNX

6.2.3.1 Transit PTNX Involved in the replaced connection

ANF-PR shall be applicable to a call whose protocol control state, as defined in ETS 300 172, on each of the two links (incoming and outgoing) is Active and whose call control state, as defined in ETS 300 172 is TCC_Call_Active.

NOTE 7

State Active will have been reached as a result of ETS 300 172 call establishment procedures, possibly in conjunction with supplementary service and/or ANF procedures.

ETS 300 172 protocol control and call control procedures for call clearing at a Transit PTNX shall apply to the release of the old connection in the event of successful switch over to the new connection.

Generic procedures for the call-related control of supplementary services, as specified in ETS 300 239 for a Transit PTNX, shall apply. For ANF-PR the requirements are limited to the passing on of Facility information elements for which the destination, as indicated in the Network Facility Extension (NFE), is not the Transit PTNX.

6.2.3.2 Transit PTNX Involved in the new connection

ETS 300 172 protocol control and call control procedures for call establishment at a Transit PTNX shall apply to the establishment of the new connection.

ETS 300 172 protocol control and call control procedures for call clearing at a Transit PTNX shall apply to the release of the new connection in the event of failure to complete ANF-PR successfully.

Generic procedures for the call-related control of supplementary services, as specified in ETS 300 239 for a Transit PTNX, shall apply. For ANF-PR the requirements are limited to the passing on of Facility information elements for which the destination, as indicated in the Network Facility Extension (NFE), is not the Transit PTNX.

6.2.3.3 Transit PTNX Involved in the retained connection

The procedures below are applicable only if the optional procedures for retention of part of the old connection (see subclause 6.6) are supported.

ANF-PR shall be applicable to a call whose protocol control state, as defined in ETS 300 172, on each of the two links (incoming and outgoing) is Active and whose call control state, as defined in ETS 300 172 is TCC_Call_Active.

NOTE 8

State Active will have been reached as a result of ETS 300 172 call establishment procedures, possibly in conjunction with supplementary service and/or ANF procedures.

Generic procedures for the call-related control of supplementary services, as specified in ETS 300 239 for a Transit PTNX, shall apply.