SLOVENSKI STANDARD
SIST-TS ETSI/TS 101 914 V1.1.1:2005

01-marec-2005

Zasebno omrežje z integriranimi storitvami (PISN) - Uporaba QSIG na referenčni točki C med PINX in medvezalnim omrežjem

Private Integrated Services Network (PISN); Use of QSIG at the C reference point between a PINX and an interconnecting network

Ta slovenski standard je istoveten z: TS 101 914 Version 1.1.1

ICS:

33.040.35 Telefonska omrežja Telephone networks

SIST-TS ETSI/TS 101 914 V1.1.1:2005 en

ETSI TS 101 914 V1.1.1 (2001-03)

Technical Specification

Private Integrated Services Network (PISN); Use of QSIG at the C reference point between a PINX and an interconnecting network

Reference
DTS/ECMA-00213

Keywords
C reference point, PINX, PISN, QSIG

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Sous-Préfecture de Grasse (06) N° 7803/88

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Introduction

Brief History

The present document is one of a series of ECMA 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. It has been produced under ETSI work item DTS/ECMA-00213.

The present document specifies the functional profile for interconnecting Private Integrated services Network eXchanges (PINX) to VPN service centres to permit interoperability between equipment from different vendors and service providers.

The present document is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and other international and regional standardization bodies. It represents a pragmatic and widely based consensus.

The present document is contributed to ISO/IEC JTC1 under the terms of the fast-track procedure, for adoption as an ISO/IEC International Standard. Thereafter it is proposed to ETSI for endorsement as an EN by means of the One Step Approval Procedure (OAP).

The presant document has been adopted by the General Assembly of December 2000.

1 Scope

The present document specifies the combination of base standards, together with the selection of appropriate options and parameter values, necessary to specify how QSIG/PSS1 can be used to provide digital signalling capabilities at interfaces at the C reference point between a Private Integrated services Network eXchange (PINX) and an Interconnecting Network (ICN) to permit interoperability between equipment from different vendors and different public or private service providers.

NOTE 1: PINX in the sense of the present document is used in the meaning of a PINX directly attached to the ICN.

The present document is applicable to attached PINXs and Interconnecting Networks (ICN).

The present document identifies the necessary or optional employment of particular functions, procedures and services when provided:

- physical and electrical characteristics (physical layer) of the interfaces to the transmission systems to be employed;
- data link layer procedures;
- network layer procedures; and
- supplementary services and additional network features to meet specific corporate network user requirements.

The present document states requirements upon attached PINXs and Interconnecting Network (ICN) implementations in order to achieve interoperability between equipment in PISNs serving as Corporate telecommunication Networks (CNs).

NOTE 2: Implementation of the present document does not preclude a manufacturer from offering other means of interconnection. It also does not preclude a VPN service provider to offer basic call communications between a PINX and other networks like PSTN or ISDN.

ISO/IEC TR 14475 specifies various access arrangements between a PINX and a public network where reference points C and T reside either at a single or at separate interfaces. The scope of the present document is limited to cover the C reference point aspects at a separate interface.

The current version of the present document does not intend to specify any gateway or end PINX requirements for the ICN side of the interface. Therefore it typically uses the term "virtual transit PINX" instead of Interconnecting Network (ICN).

2 Conformance

A system conforms to the present document if it correctly performs all the mandatory capabilities defined in the requirement list (RL) (annex A) and the profile specific ICS (annex B).

NOTE: For the purpose of the present document capabilities marked as optional in the base standards may be mandatory or excluded.

3 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

The following standards contain provisions which, through reference in this text, constitute provisions of the present document. All standards are subject to revision, and parties involved are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Standards organizations maintain registers of currently valid standards.

In the case of references to ECMA Standards that are aligned with ISO/IEC International Standards, the number of the appropriate ISO/IEC International Standard is given in brackets after the title of the ECMA reference.

For the purpose of the present document dated references point at the earliest applicable editions.

3.1 References of general significance

ECMA-133 (1998): "Private Integrated Services Network (PISN) - Reference Configurations for PISN Exchanges (PINX)". (International Standard ISO/IEC 11579-1).

ECMA-143 (1997): "Private Integrated Services Network (PISN) - Circuit Mode Bearer Services - Inter-Exchange Signalling Procedures and Protocol (QSIG-BC)". (International Standard ISO/IEC 11572).

ECMA-155 (1997): "Private Integrated Services Networks - Addressing". (International Standard ISO/IEC 11571).

ECMA-165 (1997): "Private Integrated Services Network (PISN) - Generic Functional Protocol for the Support of Supplementary Services - Inter-Exchange Signalling Procedures and Protocol (QSIG-GF)". (International Standard ISO/IEC 11582).

ECMA-226 (1995): "Private Integrated Services Network (PISN) - Mapping Functions for the Employment of Dedicated Circuit Mode Connections as Inter-PTNX Connections (MAPPING-CM-STATIC) ".

ECMA-253 (2000): "Private Integrated Services Network (PISN) - Mapping Functions for the Employement of 64 kbit/s Circuit Mode Connection with 16 kbit/s Sub-multiplexing (Mapping/16)".

ETSI EN 300 172 (v.1.4.1): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit-mode basic services [ISO/IEC 11572 (1996) modified]".

ETSI ETS 300 239 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Generic functional protocol for the support of supplementary services [ISO/IEC 11582 (1995), modified]".

ETSI EN 300 402-4: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 4: Protocol Implementation Conformance Statement (PICS) proforma specification for the general protocol".

ISO/IEC 9646-7 (1995): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

ISO/IEC 11572 (1997):"Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit mode bearer services - Inter-exchange signalling procedures and protocol".

ISO/IEC 11572 (1997): "Amendment 1: Segmentation and reassembly".

ISO/IEC 11572 (1997): "Amendment 2: Additional progress descriptions".

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 14474 : "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Functional requirements for static circuit-mode inter-PINX connections".

ISO/IEC TR 14475 (1996): "Information technology - Telecommunications and information exchange between systems - Private integrated services network - Architecture and scenarios for private integrated services networking".

ITU-T Recommendation E.164 (1997): "The international public telecommunication numbering plan".

ITU-T Recommendation I.430 (1995): "Basic user-network interface - Layer 1 specification".

ITU-T Recommendation I.431 (1993): "Primary rate user-network interface - Layer 1 specification".

ITU-T Recommendation Q.920 (1993): "Digital Subscriber Signalling System No. 1 (DSS1) - ISDN user-network interface data link layer - General aspects".

Amendment to ITU-T recommendation Q.920: New Annex A (2000).

ITU-T Recommendation Q.921 (1997): "ISDN user-network interface - Data link layer specification".

Amendment to ITU-T Recommendation Q.921: New Annex J (2000).

3.2 References to supplementary services and ANFs

ECMA-174: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Call Diversion Supplementary Services (QSIG-CF)".(International Standard ISO/IEC 13873).

ECMA-176: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Path Replacement Additional Network Feature (QSIG-PR)". (International Standard ISO/IEC 13874).

ECMA-178: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Call Transfer Supplementary Service (QSIG-CT)". (International Standard ISO/IEC 13869).

ECMA-212: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Advice of Charge Supplementary Services (QSIG-AOC)".(International Standard ISO/IEC 15050).

ECMA-215: "Private Integrated Services Network (PISN) - Cordless Terminal Mobility (CTM) - Inter-Exchange Signalling Protocol - Cordless Terminal Incoming Call Additional Network Feature (QSIG-CTMI)".

ECMA-221: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Call Interception Additional Network Feature (QSIG-CINT)". (International Standard ISO/IEC 15054).

ECMA-225: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Transit Counter Additional Network Feature (QSIG-TC)". (International Standard ISO/IEC 15056).

ECMA-264: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Call Priority Interruption and Call Priority Interruption Protection Supplementary Services (QSIG-CPI(P))" (International Standard ISO/IEC 15992).

ECMA-284: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Private User Mobility (PUM) - Call Handling Additional Network Features (QSIG-PUMCH)". (International Standard ISO/IEC 17878).

ECMA-300: "Private Integrated Services Network (PISN) - Inter-Exchange Signalling Protocol - Single Step Call Transfer Supplementary Service (QSIG-SSCT)" (International Standard ISO/IEC DIS 19460).

4 Definitions

For the purposes of the present document, the following terms and definitions apply:

Interconnecting Network (ICN): part of a third party provided network, e.g. a public network, which provides the functions needed to interconnect PINXs. The functionality of the ICN includes transit PINX functionality, associated transmission capabilities and may include gateway PINX functionality.

Virtual Transit PINX: Interconnecting Network performing only Transit PINX functions

4.1 External definitions

For the purposes of the present document, the terms and definitions given in the following documents apply:

Attached PINX	(ISO/IEC 14475)
Destination PINX	(ECMA-165)
End PINX	(ECMA-165)
Gateway PINX	(ECMA-143)
Incoming Call	(ECMA-143)
Inter-PINX Connection	(ECMA-253)
Inter-PINX Link	(ECMA-253)
Originating PINX	(ECMA-143)
Outgoing Call	(ECMA-143)
Preceding PINX	(ECMA-165)
Private Integrated Services Network (PISN)	(ECMA-133)
Private Integrated Services Network Exchange (PINX)	(ECMA-133)
C reference point	(ECMA-133)
Q reference point	(ECMA-133)
Side, Incoming Side and Outgoing Side	(ECMA-143)
Source PINX	(ECMA-165)
Subsequent PINX	(ECMA-165)
Terminating PINX	(ECMA-143)
Transit PINX	(ECMA-143)

5 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ANF	Additional Network Feature
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation One
BC	Basic Call
BS	Bearer Service
CINT	Call Interception
CN	Corporate telecommunication Network

CT	Call Transfer
EN	European Norm
ETS	European Telecommunication Standard
GF	Generic Functional protocol (for the support of supplementary services)
GW	GateWay
i	Irrelevant
ICN	InterConnecting Network
M, m	Mandatory
MP	MaPping
N/A, n/a	Not Applicable
NFE	Network Facility Extension
O, o	Optional
o.i	Optional, qualified
PINX	Private Integrated services Network eXchange
PISN	Private Integrated Services Network
PNP	Private Numbering Plan
PR	Path Replacement
PSTN	Public network infrastructure
QoS	Quality of Service
QSIG	Q reference point SIGnalling system
RL	Requirements List
SM/SREJ	Set Mode/Selective REJect
SS	Supplementary Service
TC	Transit Counter
TCC	Transit Call Control
TEI	Terminal Endpoint Identifier
UDI	Unrestricted Digital Information
VPN	Virtual Private Network
x	eXcluded
X	Not supported/not used

6 Specification framework

6.1 Scenarios

Figure 1 shows an example scenario where the Interconnecting Network (ICN) is located within a public network and provides virtual transit PINX functionality.

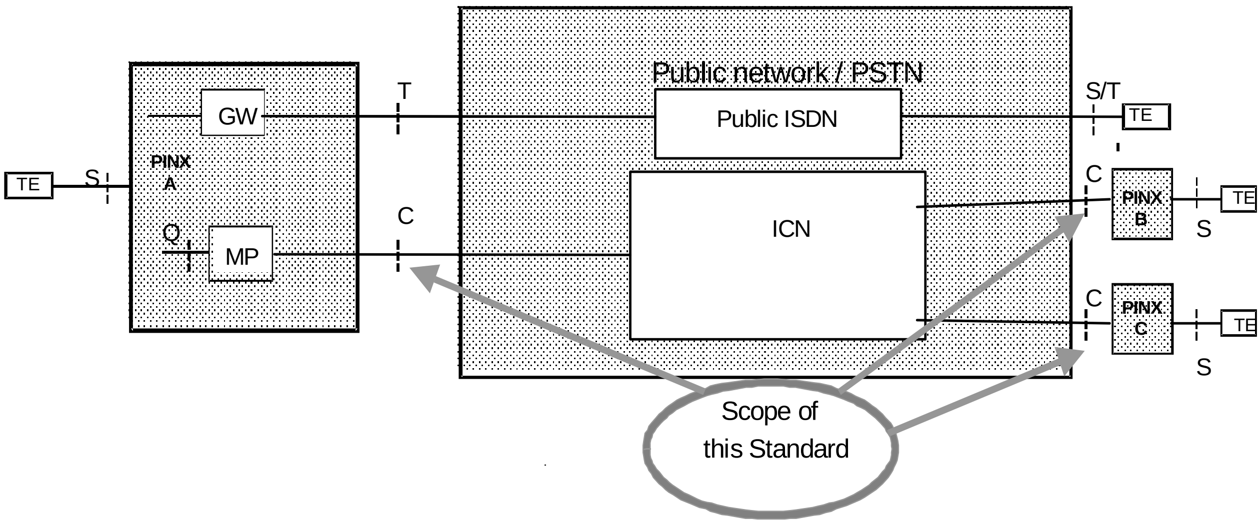

Figure 1: Example Scenario