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Zasebno omrežje z integriranimi storitvami (PISN) - Funkcije preslikav za tuneliranje QSIG skozi omrežja H.323

Private Integrated Services Network (PISN); Mapping functions for the tunnelling of QSIG through H.323 networks

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Private Integrated Services Network (PISN); Mapping functions for the tunnelling of QSIG through H.323 networks

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Foreword

This Technical Specification (TS) has been produced by ECMA on behalf of its members and those of the European Telecommunications Standards Institute (ETSI).

Brief history

The present document is one of a series of ECMA standards defining mapping functions in exchanges of Private Integrated Services Networks required for the utilization of intervening network scenarios. The series uses the ISDN concepts as developed by ITU-T (formerly CCITT) and is also within the framework of standards for open systems interconnection as defined by ISO.

The present document specifies mapping functions for the type of scenarios where two or more PINXs are interconnected via on-demand connections using an H.323 packet network as the IVN.

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 national standardization bodies. It represents a pragmatic and widely based consensus.

The second edition is fully compatible with the first edition. It specifies one part of the procedures of the optional semi-permanent scenario in more detail.

1 Scope

The present document specifies functions for using an H.323 packet network in order to interconnect two Private Integrated services Network eXchanges (PINXs) forming part of a Private Integrated Services Network (PISN). Interconnection is achieved by carrying the inter-PINX signalling protocol over the H.323 call signalling channel, making use of the protocol tunnelling facilities of H.323, and inter-PINX user information (e.g. voice) over logical channels established through H.323. Each logical channel usually represents a unidirectional media stream conveyed by means of the Real-time Transport Protocol (RTP). The inter-PINX signalling protocol is assumed to be QSIG, as specified in ECMA-143 [2], ECMA-165 [3] and other standards.

The present document provides for an on-demand type of interconnection, where a separate H.323 call is established at the start of each PISN call and cleared down at the end of that call. A semi-permanent scenario where a single H.323 call with an indefinite lifetime carries QSIG on behalf of many PISN calls is described as an additional option.

In the scenarios covered in the present document, the PINXs participating in a call are not necessarily aware of the H.323 network providing the interconnection, and the features available are those of the QSIG network. This is different from a scenario where true interworking between QSIG and H.323 (i.e. QSIG-H.323-QSIG) is used to connect two PISNs or two parts of the same PISN. In this latter case all networks participate in a call on equal terms, and features are limited to those available in all networks and supported by the gateways. This latter scenario is outside the scope of the present document.

The present document is applicable to PINXs that can be interconnected to form a PISN using QSIG as the inter-PINX signalling protocol.

2 Conformance

In order to conform to the present document, a PINX shall satisfy the requirements identified in the Implementation Conformance Statement (ICS) proforma in annex A.

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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.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

- [1] ECMA-133: "Private Integrated Services Network (PISN) - Reference Configuration for PISN Exchanges (PINX)".
- [2] ECMA-143: "Private Integrated Services Network (PISN) - Circuit Mode Bearer Services - Inter-Exchange Signalling Procedures and Protocol (QSIG-BC)".
- [3] ECMA-165: "Private Integrated Services Network (PISN) - Generic Functional Protocol for the Support of Supplementary Services - Inter-Exchange Signalling Procedures and Protocol (QSIG-GF)".
- [4] ITU-T Recommendation H.225.0: "Call signalling protocols and media stream packetization for packet-based multimedia communication systems".
- [5] ITU-T Recommendation H.245: "Control protocol for multimedia communication".

- [6] ITU-T Recommendation H.323: "Packet-based multimedia communications systems".
- [7] ITU-T Recommendation H.323 annex M.1: "Tunnelling of signalling protocols (QSIG) in H.323".

4 Definitions

4.1 External definitions

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

- Call independent signalling connection (ECMA-165 [3]);
- C reference point (ECMA-133 [1]);
- Gatekeeper (ITU-T Recommendation H.323 [6]);
- Gateway, Trunking Gateway (ITU-T Recommendation H.323 [6]);
- Intervening network (ECMA-133 [1]);
- Logical channel (ITU-T Recommendation H.323 [6]);
- Preceding PINX (ECMA-165 [3]);
- Private Integrated Services Network (ECMA-133 [1]);
- Private Integrated services Network eXchange (ECMA-133 [1]);
- Q reference point (ECMA-133 [1]);
- Subsequent PINX (ECMA-165 [3]).

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4.2 Other definitions

4.2.1 Call

4.2.1.1 H.323 call

A call as defined in ITU-T Recommendation H.323 [6], i.e. a point-to-point communication between two H.323 endpoints. Here specifically a call in the H.323 network between two gateways.

4.2.1.2 PISN call

A call as defined in ECMA-143 [2] and ECMA-165 [3].

4.2.1.3 Call segment

A portion of a (PISN) call between two entities taking part in that call. The smallest segment is between adjacent entities, e.g. between two PINXs across one Inter-PINX link.

4.2.2 Channel

A means of bi-directional transmission of user or signalling information between two points.

4.2.2.1 D_Q-Channel

A channel used to convey call control information between the Q reference points of two peer PINXs.

4.2.2.2 U_Q-Channel

A channel used to convey user information between the Q reference points of two peer PINXs.

4.2.3 Inter-PINX Connection (IPC)

A connection provided by an IVN between two C reference points used to transport inter-PINX information from the PISN control plane and/or the PISN user plane.

4.2.4 Inter-PINX Link (IPL)

A link between the Q reference points of two PINXs, comprising the totality of signalling transfer and user information transfer means.

4.2.5 PINX roles

4.2.5.1 Initiating PINX

The PINX that initiates an IPL establishment request.

4.2.5.2 Accepting PINX

The PINX that accepts an IPL establishment request.

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5 List of acronyms (standards.iteh.ai)

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

GK	Gatekeeper
ICS	Implementation Conformance Statement
IP	Internet Protocol
IPC	Inter-PINX Connection
IPL	Inter-PINX Link
IVN	InterVening Network
PINX	Private Integrated services Network eXchange
PISN	Private Integrated Services Network
QSIG	SIGNalling system for the Q reference point
RAS	Registration, Admission and Status
RRQ	Register ReQuest message
RTP/RTCP	Real-time Transport Protocol / Real Time Control Protocol
TCP	Transmission Control Protocol
UDP	User Datagram Protocol

6 Introduction

6.1 Reference configuration

ECMA-133 [1] defines a reference configuration for a PINX. Logically the switching and call control functions of a PINX communicate over an instance of the Q reference point with a peer PINX. This communication is known as an Inter-PINX Link (IPL) and comprises a signalling channel, known as a D_Q-channel, and one or more user information channels, each known as a U_Q-channel; see figure 1. One or more IPLs can be established between the same pair of PINXs.

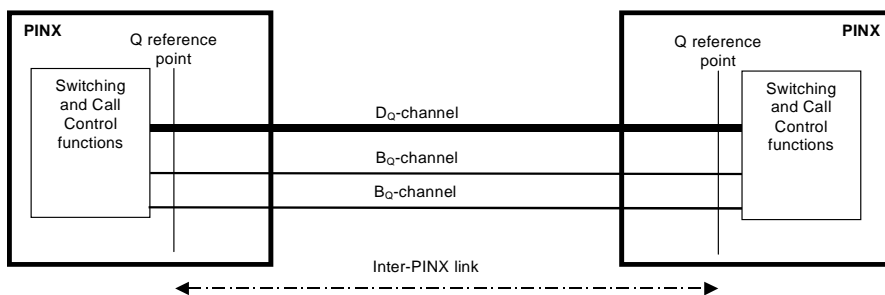


Figure 1: IPL concept

There are many ways of implementing an IPL. In general, the IPL uses services of another network, known as an InterVening Network (IVN). A PINX interfaces to the IVN at the C reference point. The IVN provides connections, known as Inter-PINX Connections (IPCs) between the C reference points of the peer PINXs. Mapping functions within each PINX map the D_Q-channel and the U_Q-channels at the Q reference point onto one or more IPCs at the C reference point.

6.2 Specific scenarios

The present document specifies mapping functions for use when the IVN is an H.323 packet network that is used to provide the following types of IPC:

- a signalling connection for carrying signalling information; and
- a pair of UDP streams, one stream in each direction, for carrying user information over RTP.

NOTE: Other means of transporting user information can be used, e.g. T.38 fax without RTP, an ATM virtual channel, or a bi-directional TCP connection instead of UDP streams. See ITU-T Recommendation H.323 [6] for more details. These cases are outside the scope of the present document.

A single IPL requires a single signalling connection, for support of the D_Q-channel, and one pair of UDP streams per U_Q-channel.

The main inter-PINX connection scenario described in the present document is an on-demand connection scenario. This means that an IPL is established whenever a PISN call segment is to be set up between two PINXs and released when the PISN call ends. An optional semi-permanent scenario is also described, where multiple concurrent or consecutive PISN calls can use the same IPL.

In both scenarios the signalling connection is established by means of an H.323 call, using the protocol tunnelling facilities provided by ITU-T Recommendations H.225.0 [4] and H.323 annex M.1 [7]. The H.225.0 call signalling connection in conjunction with the tunnelling of the QSIG signalling is used to provide the D_Q-channel. The pair of UDP streams used to provide an inter-PINX user connection (U_Q-channel) is established as H.323 logical channel(s). An IPL may have multiple U_Q-channels.

Figure 2 illustrates these concepts.

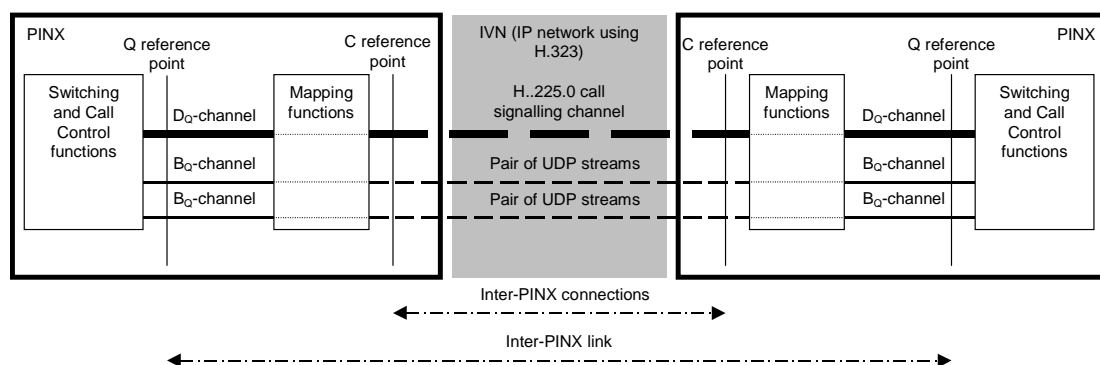


Figure 2: H.323 as InterVening Network (IVN)