

# TECHNICAL REPORT

**ISO/IEC  
TR  
14475**

Second edition  
2001-07-01

---

---

## **Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Architecture and scenarios for Private Integrated Services Networking**

*Technologies de l'information — Télécommunications et échange  
d'information entre systèmes — Réseau privé à intégration de services —  
Architecture et scénarios pour réseau privé à intégration de services*

---

---

Reference number  
ISO/IEC TR 14475:2001(E)



**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 2001

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.ch](mailto:copyright@iso.ch)  
Web [www.iso.ch](http://www.iso.ch)

Printed in Switzerland

<b>Contents</b>		<b>Page</b>
1	Scope	1
2	References	1
3	Terms and definitions	1
3.1	External Definitions	2
3.2	Special Definitions	2
4	Symbols and Abbreviations	4
5	Introduction	5
5.1	PINX Reference Configuration	5
5.2	Additional Descriptions	6
5.2.1	Inter-PINX Connection (IPC)	6
5.2.2	Inter-PINX Link (IPL)	6
5.2.3	Relationship between IPLs and IPCs	7
6	Details of the Functional Groupings as Relevant for Scenario Handling	7
6.1	Mapping Unit (MP)	7
6.1.1	Physical Adaptation	8
6.1.2	Mapping Matrix	8
6.2	Inter-PINX Connection Control (ICC)	9
6.2.1	IPC Control	9
6.2.2	IPL Control	9
6.3	Scenario Management	9
6.3.1	Link Resource Management	10
6.3.2	Mapping Management	10
6.3.3	IPC Management	10
6.4	Complete PINX Model	10
7	Configuration Variants	11
7.1	PINX with Multiple IPLs	11
7.2	More than One Type of IVN	12
7.3	Different Spread of IPCs among the Interfaces at the Two PINXs	12
8	IPL Establishment and administration procedures	13
8.1	IPL Establishment using ScenSIG	13
8.1.1	Static Pre-Conditions	14
8.1.2	Establishment of a First IPC	14
8.1.3	IPL Initialisation Process	14

8.1.4	Establishment of the D <sub>Q</sub> -Channel	15
8.1.5	Establishment of U <sub>Q</sub> -Channels	15
8.1.6	Channel Mapping	15
8.2	IPL Establishment Procedures without using ScenSIG	16
8.3	IPL Administration Procedures	16
9	Items for Future Standardisation	16
9.1	Mapping Function	17
9.1.1	Physical Adoption	17
9.1.2	Mapping Matrix	17
9.1.3	Static Pre-Conditions	17
9.2	ScenSIG	17
9.2.1	IPL Establishment and Administration Procedures	17
9.2.2	Bearer Modification Procedures	18
9.3	Bearer Conditioning	18
10	Scenarios	18
10.1	Scenarios: Dedicated Transmission Systems	18
10.1.1	Scenario 1.1 - Unstructured Transmission Link	18
10.1.2	Scenario 1.2 - Structured Transmission Link	19
10.2	Scenarios: Semi-Permanent IVN Connections	19
10.2.1	Scenario 2.1 - Semi-permanent Circuit Switched	19
10.2.2	Scenario 2.2 - Permanent Virtual Call	20
10.3	Scenarios: On-Demand Public Network Connections	21
10.3.1	Scenario 3.1 - On-demand Circuit Switched	21
10.3.2	Scenario 3.2 - ISDN Call with User-to-User Signalling	21
10.3.3	Scenario 3.3 - On Demand Virtual Call	22
10.4	Scenarios: Virtual Private Network	23
10.4.1	Introduction	23
10.4.2	Access Arrangements	23
10.4.3	Scenario 4.1 -Transit PINX	26
10.4.2	Scenario 4.2 -Centrex	26
10.4.3	Scenario 4.3 -Gateway to another network	27
Annexes		
A	Attribute Values	28
B	Scenario 4.4 - Relay Node	30

## 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.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard (“state of the art”, for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

Technical Reports are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Attention is drawn to the possibility that some of the elements of this Technical Report may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC TR 14475, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

This second edition cancels and replaces the first edition (ISO/IEC TR 14475:1996), which has been technically revised.

# Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Architecture and scenarios for Private Integrated Services Networking

## 1 Scope

A Private Integrated Service Network (PISN) is a network comprising either one PINX or more than one PINX interconnected by Inter-PINX connections. This Technical Report is concerned with inter-PINX connections (IPC) that are provided by Intervening Networks (IVN), and the way in which these are handled by PINXs to provide a platform for inter-PINX communication. Different types of IVNs can be used to provide IPCs, in accordance with the scenarios indicated in ISO/IEC 11579-1. These are Overlay Scenarios in that they enable the services of the PISN to operate transparently across an IVN.

Connected PINXs need to co-ordinate their use of IVNs, and appropriate standardisation is needed to allow networks to be created employing PINXs and IVNs from multiple vendors. The following points need to be considered:

- In general but depending on the type of IVN, procedures and signalling protocols between the PINXs are needed for the establishment, maintenance and release of IPCs. Appropriate standardisation of these procedures and signalling protocols is necessary.
- At the Q reference point (a conceptual point within a PINX) channels and PISN call control signalling (QSIG) are defined independently of the type of IVN. However, at the C reference point (where the PINX is connected to the IVN), the representation of the channels and of signalling is dependent on the type of IVN, and on how the PINXs use the IPCs. Appropriate standardisation of these aspects at the C reference point is necessary.
- In general the relationship between a channel at the Q reference point and its representation at the C reference point is not static, and procedures and signalling between the PINXs are needed for the co-ordination of these relationships. Appropriate standardisation of these procedures and signalling is necessary.
- Appropriate mechanisms need to be standardised for conveying inter-PINX signalling through the IVN. These will depend on the characteristics of the IPC used.

The aim of this Technical Report is to identify:

1. In addition to PISN call control signalling (QSIG), what needs to be standardised, in order to be able to inter-connect PINXs;
2. General techniques, procedures, protocols etc., that apply to of all (or at least very many) types of IVNs.

## 2 References

ISO/IEC 7776:1995, *Information technology — Telecommunications and information exchange between systems — High-level data link control procedures — Description of the X.25 LAPB-compatible DTE data link procedures*

ISO/IEC 11572:2000, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Circuit mode bearer services — Inter-exchange signalling procedures and protocol*

ISO/IEC 11574:2000, *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)*

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*

ITU-T Rec. I.140 (1993), *Attribute technique for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*

ITU-T Rec. I.112 (1993), *Vocabulary of terms for ISDNs*

ITU-T Rec. I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*

ITU-T Rec. I.210 (1993), *Principles of telecommunication services supported by an ISDN and the means to describe them*

ITU-T Rec. I.411 (1993), *ISDN user-network interfaces — Reference configurations*

ITU-T Rec. I.430 (1995), *Basic user-network interface — Layer 1 specification*

ITU-T Rec. X.31 (1995), *Support of packet mode terminal equipment by an ISDN*