

**Corporate telecommunication Networks (CN);
Project Plan**



European Telecommunications Standards Institute

Reference

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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Business Telecommunications (BTC), and is now submitted for the ETSI standards Membership Approval Procedure phase.

The present document covers an ETSI Standardization Project Plan and thus is a living document. Its current version reflects the respective stage of the Project.

1 Scope

The present document defines the work areas and contents of the standardization work programme for Corporate telecommunication Networks (CN). The aim is to manage and co-ordinate the European standardization process spread over various technical bodies (TBs) inside ETSI and outside ETSI (ECMA).

2 References

- [1] Instruction D93080A.WFW: "Project Oriented Management of Standardization" (ETSI/TA18(93)32).
 - [2] Bons de Commande BC-IT 74 to 77, SOGITS Working Document No. 243.1, Brussels, 2.8.1988.
 - [3] TCR/TR 034: "VPN Task Group Report" .
 - [4] ETS 300 415: "Business Telecommunication; Terms and Definitions", edition 2.
 - [5] Bon de Commande BC-T-326, This document is reproduced as annex D.
 - [6] TCR-TR 033 (1994): Private telecommunication networks (PTN); Integrated scenario.
 - [7] EG 201 026-1: Corporate telecommunication Networks (CN); Standardization analysis - Part 1: Strategy.
 - [8] EG 201 026-2: Corporate telecommunication Networks (CN); Standardization analysis - Part 2: Enhanced voice and non-voice services.
 - [9] prEG 201 026-3: Corporate telecommunication Networks (CN); Standardization analysis - Part 3: VPN.
 - [10] prEG 201 026-4: Corporate telecommunication Networks (CN); Standardization analysis - Part 4: CN Mobility.
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3 Definitions and abbreviations

3.1 Definitions

No specific definitions are used within the description of the CN Project Plan. The subsequently listed definitions are imported from the sources indicated in [] merely for the convenience of the reader:

Corporate telecommunication Network (CN): Sets of equipment [Customer Premises Equipment (CPE) and/or Customer Premises Networks (CPN)] which are located at geographically dispersed locations and are interconnected to provide networking services to a defined group of users (based on SRC5 Report).

NOTE 1: Since there are two managed projects in ETSI, i.e. CTM (cordless terminal mobility) and CTN (Corporate Telecommunication Network), of which acronyms are difficult to distinguish in audible conversation and thus are likely to be confused, it has been decided to replace the acronym CTN by CN (Corporate telecommunication Network).

NOTE 2: According to ETS 300 415 [4] telecommunication facilities of a "defined group" or a "pre-determined set of users" are called "private" telecommunication facilities. Since private telecommunication typically applies to corporations, private telecommunication standards are considered a subset of the CN standards area.

Within the present document the terms "corporate telecommunication network", including its abbreviation "CN", and "Private Integrated Services network", including its abbreviation "PISN", are used as synonyms.

Virtual Private Network (VPN): That part of a CN that uses shared switched network infrastructures provided by one or more third parties, see Bons de Commande BC-IT [4].

Private Integrated Services Network eXchange (PINX): A nodal entity in a PISN that provides automatic switching and call handling functions used for the provision of telecommunication services. The nodal entity can be implemented by one or more pieces of equipment located on the premises of the private network administrator or by equipment co-located with, or physically part of, a public network, see Bons de Commande BC-IT [4]

CENTREX: The service package offered on public networks to emulate PINX capabilities.

Integrated Services Private Branch eXchange (ISPBX): The implementation of a PINX offering ISDN-like capabilities, separate from public network equipment.

Integrated Services CenTralized eXchange (ISCTX): The switching and ISDN-like service provisioning function offering the CENTREX package on a public network equipment, see Bons de Commande BC-IT [4].

InterConnecting Network (ICN): That part of the public network equipment which provides a set of functions needed to interconnect PINXs. The functionality of the ICN includes transit-PINX functionality, associated transmission capabilities and may include gateway-PINX functionality, see Bons de Commande BC-IT [4].

3.2 Abbreviations

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

ATM	Asynchronous Transfer Mode
CENTREX	CENTRALized corporate telecommunication network EXchange
CN	Corporate telecommunication Network
CSTA	Computer Supported Telecommunication Applications
CTM	Cordless Terminal Mobility
FR	Frame Relay
GVNS	Global Virtual Network Service
GW	GateWay
ICN	InterConnecting Network
IN	Intelligent Network
IP	Internet Protocol
INMS	Integrated Network Management System
ISCTX	Integrated Services CenTralized eXchange
ISPBX	Integrated Services Private Branch eXchange
ITAEG-T	Information Technology Advisory and Experts Group on Telecommunications
IVN	Inter-Vening Network
JEEC	Joint ECMA/ETSI Committee
LAN	Local Area Network
MAN	Metropolitan Area Network
MIB	Management Information Base
NNI	Network-Network Interface
PBX	Private Branch eXchange
PDH	Plesiochronous Digital Hierarchy
PINX	Private Integrated Services Network eXchange
PISN	Private Integrated Services Network
PST	Project Support Team
PUM	Private User Mobility
QSIG	Q Interface Signalling protocol
SAAL	Signalling ATM Application Layer
SDH	Synchronous Digital Hierarchy
SRC	Strategic Review Committee
TMN	Telecommunication Management Network
UNI	User-Network Interface
UPT	Universal Personal Telecommunication
VPN	Virtual Private Network
WAN	Wide Area Network

4 Title of the project

The project is titled CORPORATE TELECOMMUNICATION NETWORKS STANDARDIZATION.

5 Proposer and sponsor

The Strategic Review Committee on Corporate **telecommunication** Networks (SRC5) has stated that the ETSI work programme as relevant for this area needs to be harmonized and properly co-ordinated across various experts groups being involved within ETSI and ECMA. Consistently, SRC5 recommended that the ETSI work programme on corporate telecommunication networks be managed as an ETSI Project under the responsibility of TC BTC.

ETSI TA18 has approved this recommendation and assigned the task of managing corporate telecommunication network activities within ETSI to TC BTC, and to carry out this as an ETSI Project following the concept of ETSI Project Management.

Within BTC this task is carried out by a Project Management consisting of a Project Manager and a Project Support Team (PST).

Due to the ETSI re-organization, the CN Standardization Project, including its subprojects, has been taken over by the ETSI Project on Corporate telecommunication Networks (EP CN) from TC BTC, as from September 1996.

6 Content of the CN Project

The CN Project covers the standardization activities related to corporate telecommunication networks. This standardization area has been investigated by a Strategic Review Committee, SRC5, in the years 1992 and 1993 to help ETSI in building its work programme on CN. In addition, the relevant results of SRC6, further elaborations of user expectations, e.g. on VPN, and of ETSI PT85 (CN future work programme analysis, based on Bon des Commande BC-T-326) are taken into account.

SRC5 identifies six major topics as being of highest current interest to CN users:

- Enhanced voice.
- Virtual private networks.
- CN Mobility.
- High-Speed/LAN.
- Multi-media.
- CN Management.

Beside these major topics, also inherited work items of [11 of annex A] are considered part of the CN Project. There is some overlap between the work programme of [11] and the standardization topics of [17 of annex A] anyhow. The CN Project thus covers also:

- CN Scenarios.
- CN Performance.

The major topics have been made sub-projects, with the exception of MULTI-MEDIA, which has become an ETSI Project of its own. No activities in this area are kept in the CN Project.

Intra-CN related Mobility work items are part of the CN Project (CN MOBILITY Subproject). Interworking related with public networks can be subject to both, the Cordless Terminal Mobility (CTM) Project and the CN Mobility Sub-Project.

For easier orientation, figure 1 shows an overview of a principal CN.

The figure represents the simplest form of a typical example, the attachment of a CN to the public ISDN, the use of a public ISDN equipment based ICN, and an inter-vening network.

Although other solutions, e.g. an ICN based on dedicated data networks, are not depicted, the same principles apply.

The CN in this example consists of two PISNs. Although in the trivial case a CN need to consist of one PISN only, also more complex configurations can be constructed by applying the same principle in multiple ways.

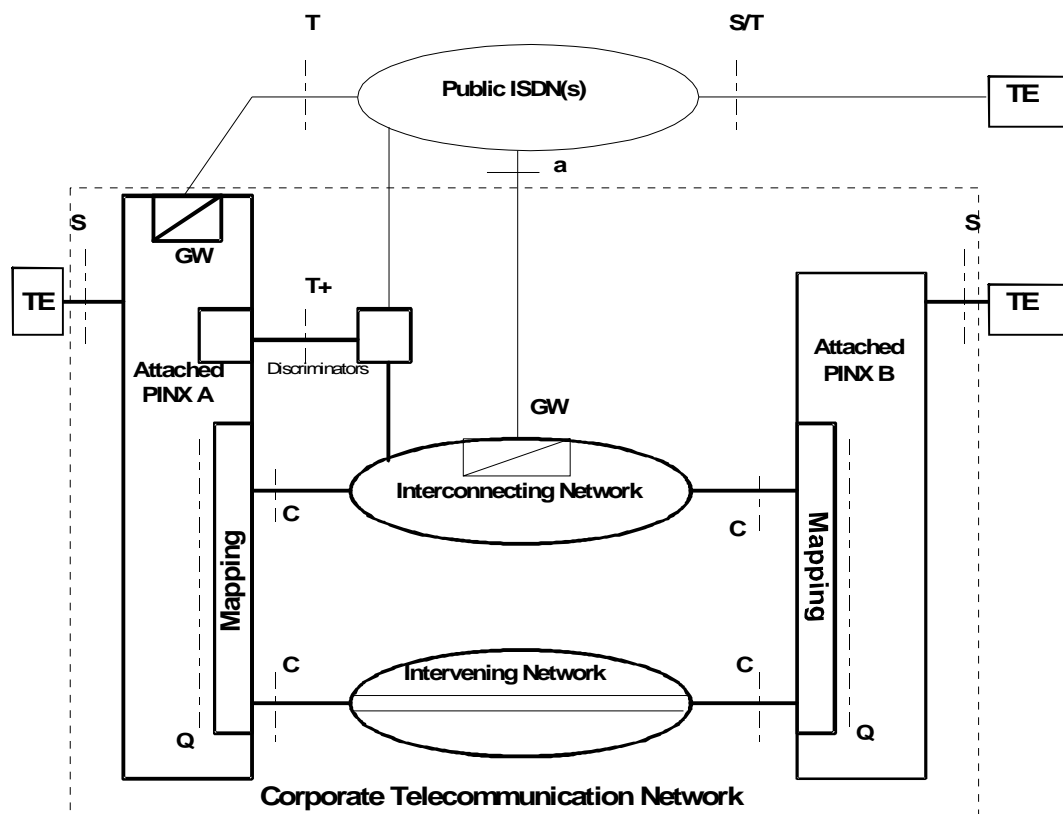


Figure 1: Overview of a principal CN (simplified example)

The two attached PINXs are inter-connected via four different means:

- the public network (in this example: a public ISDN, via T reference points); this interconnection is external to the CN;
- an interconnecting network via discrimination functions across a T+ reference point;
- an interconnecting network via C reference points;
- an intervening network, via C reference points.

The latter three are within the CN, although the switching and/or transmission equipment typically is owned by third parties, e.g. public network operators.

The term (attached) PINX is a generic term covering both, implementations on the customer premises (ISPBX) and in the public network (IS-CENTREX) see ETS 300 415 [4]. In the latter case no physical interfaces will be standardized at the T, T+ and C reference points.

The discriminator functions around the T+ reference point allow to carry attached PINX-to-public ISDN and attached PINX-to-ICN calls on the same interface.

An "attached PINX" can play either role on a specific call: to serve as an end-PINX (i.e. hosting the originating or terminating terminal of that call) or to serve as a transit-PINX, extending the call to/from another PINX that hosts the originating or terminating terminal.

Gateway functionality GW in the ICN is an option allowing for the so called Break-Out and Break-In, i.e.interconnection between the CN and the public ISDN at ICN level across an α reference point.

With the exception of teleservices, the CN standardization activities cover all relevant specifications on the definitions of terminology, architectural aspects, numbering, basic and supplementary services as well as additional network features (descriptions at all three stages, including signalling), performance, etc.

On the basis of a standardization analysis performed by PT85, see EG 201 026-1 [7] has been developed and approved which covers the strategy aspects for CN standardization, as requested by Bon de Commande BC-T-326 [5].

6.1 CN Enhanced voice and non-voice services

This sub-project encompasses work on:

- CN basic and supplementary services for the support of voice and non-voice applications.
- interworking of these services with those of the public network.
- interaction of these services with other services of the public and/or private network.

These aspects are to be taken account of in service descriptions, signalling requirements and signalling protocols.

Substructure of the Enhanced Voice Sub-Project		
Bon de Commande	Subject	Responsible STC
BC75 B/T-326	Signalling procedures (basic and suppl. services) at T-RP	SPS5
BC75 C/T-326	Signalling procedures (basic and suppl. services) at Q-RP	ECMA TC32/TG14
BC75 D/T-326	Signalling procedures (basic and suppl. services) at S-RP	ECMA TC32/TG14

The chairman of ECMA TC32, Mr Eckhard Völzke, acts as the contact person for BCs 75 C and D/BC-T-326, and the chairman of SPS5, Mr. K. Drage, acts as the contact person for BC 75 B/BC-T-326.

A common minimum set of services is being defined to offer interoperability across a CN which might be composed of any type of infrastrutural elements, including the terminals at either end of a connection. The details can be found in EG 201 026-2 [8]. The resulting activities are covered by Milestone 9.

6.2 Virtual Private Networks (VPN)

This "subproject" covers two main sub-functions: transit functionality as provided by an ICN, and end-PINX functionality as provided by an ISCTX. The architectural approach for accessing the transit functionality (ICN) has higher priority and has been defined in ETS 300 415 [6].

The coverage of the term "VPN" is illustrated in figure 2.

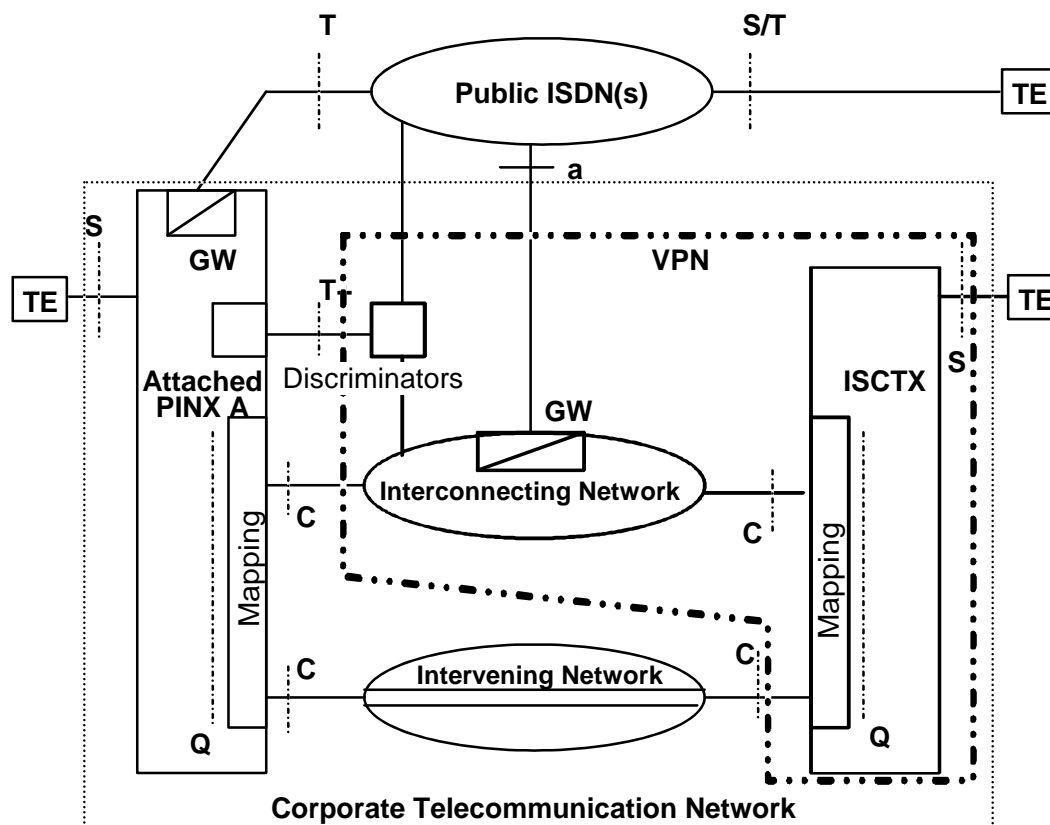


Figure 2: Coverage of the term "VPN" (example)

The involvement of two or more ICN providers in supporting one VPN requires standardization at their network-to-network boundaries, at the so-called N* reference point, see figure 3.



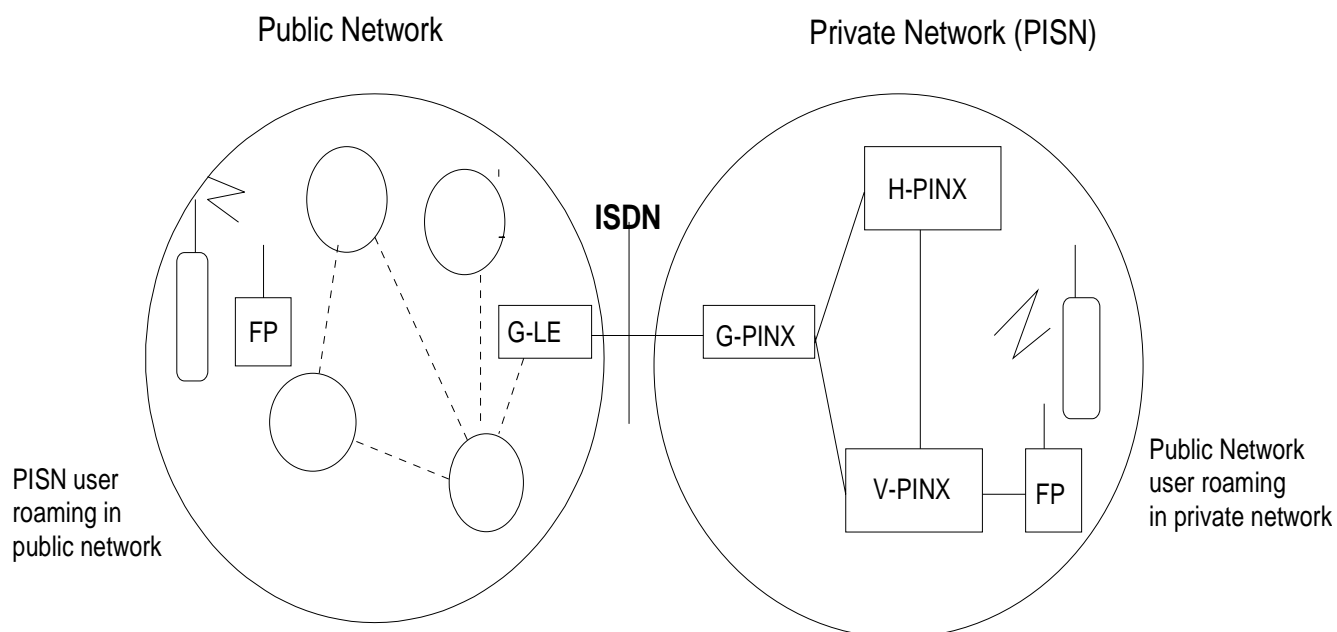
Figure 3: Multiple ICNs

The base for the VPN sub-project is the report of the VPN Task Group [3], of which the part dealing with services was approved by TA 20 as an ETR.

Mr G. Barnicoat is the contact person. The details are developed in prEG 201 026-3 [9] by Subproject CN2 (CN WG VPN).

6.3 CN Mobility

This subproject is applicable to intra-CN mobility and to mobility interworking with public networks, see figure 4. Related work items are jointly developed by CN WG MOB (stages 1 and 2) and ECMA TC32 (stage 3).



Legend: The model is simplified to show only those entities that are involved in location and call handling. The following entities are used:

- FP: Fixed Part (cordless sub-system offering radio access to CTM users)
- G-LE: Gateway Local Exchange
- G-PINX: Gateway PINX
- H-PINX: Home PINX (where the CTM user is registered)
- V-PINX: Visitor PINX (where a mobile user has logged on)

Figure 4: CN Mobility

Figure 4 shows a public and a corporate network with those functions which are relevant to CN mobility. These functions support intra-CN mobility as well as inter-network mobility.

The main working areas are:

- CN Cordless Terminal Mobility (CTM).
- Private User Mobility (PUM).
- support of Universal Personal Telecommunication (UPT) in CN (a public UPT user roaming in a CN).

The major standardization issues are:

	Standardization issue	Relevant to		
a)	location handling	UPT in CN	CN-CTM	PUM
b)	mobile call handling	UPT in CN	CN-CTM	PUM
c)	authentication principles	UPT in CN	CN-CTM	PUM
d)	provision of supplementary services to mobile users	UPT in CN	CN-CTM	PUM
e)	handover		CN-CTM	-
f)	expansion of CN-CTM to interwork with CTM provided by other networks to allow multi-network roaming		CN-CTM	-

Pre-normative work identifying the general requirements for the respective areas has been finalized. A first set of PUM and CN-CTM standards were completed in November 1995 (Milestone 6).

Additional work has to be done especially in the fields of CN access signalling (phase 2), including a reference configuration for the extension line (P reference point).

Further details have been developed in document : Corporate telecommunication Networks (CN); Standardization analysis, see prEG 201 026-4:[10] by Subproject CN3 (CN WG Mobility, rapporteur R.Wiik).

The chairmen of CN WG MOB, Mr A. Percival, and of ECMA TC32, Mr. Eckhard Völzke, act as contact persons. Public enquiry resolution meetings are run jointly between CN WG MOB and ECMA/TC32.

6.4 CN High-speed/LAN

This Sub-Project addresses work specific to CN requirements and solutions for the support of High Speed and LAN based services. It covers:

- Integrated Services operating at bearer rates in excess of 64 kbit/s in both, customer premises limited scenarios (LAN) and MAN/WANs.
- Architectural models characterizing the means of providing end-to-end services spanning LAN, intervening WAN and destination LAN segments.
- LAN specific components of the Enhanced Voice and Non-Voice Sub-Project, e.g. LAN bridges and routers, to provide a common signalling and management, peer-to-peer, UNI and NNI for various high speed and multi-media services.
- Realization of these capabilities over current PDH and SDH based leased line bearers, including a migration plan for the use of B-ISDN bearer services as they become available.
- accommodation of established LAN specific numbering and addressing schemes, within the frame work defined by the CN Scenarios Sub-Project.
- the embedment of ATM technology into broadband CNs providing cell-mode bearer capabilities.

Currently this subproject focuses on the employment of ATM technology in private B-ISDN (B-PISN).

The chairman of ECMA TC32, Mr Eckhard Völzke acts as the contact person.

6.5 CN Multimedia

Multimedia has become an ETSI Project of its own. No activities in this area are kept in the CN Project.

6.6 CN Management

This sub-project encompasses work on CN specific requirements and solutions for network management. It covers:

- Integrated Network Management System (INMS) capable of managing the objects obeying to the TMN architecture as well as to the ISO network management architecture as well as to the Internet network management architecture; all three architectural models will exist and need to be catered for in CN related Network Management Standards.
- Multiple types of MIBs need to be employable in parallel ("protocol conversion" and "MIB adapter" are required).
- Management protocols need to be developed on a peer-to-peer based management interworking principle.
- The description of Managed Objects for CN functional components as required for:
 - networking in End- and Transit-PINXs, including those of VPNs;
 - the management of services in CNs.

This sub-project applies to the Management aspects of the CN which include, inter alia:

- 1) PINXs and their on-premises, active and passive line plant;

- 2) Intervening networks employed by that CN;
- 3) Interconnecting means (e.g. VPN capabilities of public network equipment which is dedicated to that CN).

At the moment the CN Network Management sub-project is limited to the areas bulleted above. Some elaboration on these items will include:

- 1) Public ISDN equipment as part of CN in the form of an ISCTX and/or of virtual transit switching equipment:
 - a) Management of physical equipment.
 - b) Managing CN services.
 - c) Conflict of Public & Private management requirements (shared equipment).
 - f) CNs which encompass multiple Public ISDNs (e.g. international CN).
- 2) IVN:
 - a) Balancing CN call management with Public ISDN restrictions;
 - b) Role of dedicated transmission networks (e.g. SDH).

In this subproject further study is required.

A status report should be made.

The chairman of ECMA TC32/TG12, Mr D. Smith, acts as the contact person to the ETSI co-ordination team on Management.

6.7 CN Scenarios

This Sub-Project encompasses work in the course of CEC Bons de Commande BC 74 A, B & C, BC 75 A and BC 76 A. In particular, it covers the following standardization fields:

- Numbering and Addressing.
- Base Definitions (e.g. reference configurations) for the specification of interworking between exchanges of a CN.
- Methodologies for the description of CNs and their services.
- Terminology.
- Approaches for building CNs using public network infrastructure; this includes overlay and integrated scenarios; the latter cover VPN end-PINX functionality (ISCTX) as well as VPN transit functionality (ICN), as covered by BC-T-326, see annex D.
- Signalling protocols for the establishment and maintenance of interworking scenarios.

In addition, the same standardization fields with regard to High Speed / LAN are included in this Sub-Project.

A further standardization subject in the scope of CN Scenarios is the application of CNs for the support of tele-working to cover e.g. remote access to a CN as specified as a and a service entry points in VPN Task Group Report (TCR/TR 034) [3].

Substructure of the CN Scenario Sub-Project		
Bon de Commande	Subject	Responsible
BC 74 A, B , C	Configurations, Models, Definitions	ECMA TC32/TG13
BC75 A	Signalling procedures and protocols for Networking scenarios	ECMA TC32/TG14
	Functions required for Networking scenarios	ECMA TC32/TG13
BC 76 A	Numbering, Addressing, Routeing	ECMA TC32/TG13

Also BC-T-326 applies to this subproject.

The chairman of ECMA TC32/TG 13, Mr Colin Bates, acts as the contact person.

6.8 CN Performance

This standardization field is to a certain degree covered by "old" work items based on Bons de Commande BC-IT 74 [2].

In particular, values need to be allocated to transmission and grade of service related network parameters in the VPN context, as part of the overall CN budget, see SRC5 Report.

In the past, STC BTC2 prepared an ETR on transmission planning for private networks when connected to public networks. The present document is being updated and applies generally to corporate networks and takes account of the perspective liberalization of public networks.

The chairman of CN WG Performance, Mr J. Horrocks, acts as contact person.

6.9 Other CN areas of interest

Future work may encompass:

- the availability of applications offered on an internet/intranet to PISN users;
- backbone of PISN capabilities provided by non-circuit mode techniques such as Internet Protocol (IP), Frame Relay (FR) or Asynchronous Transfer Mode (ATM), e.g. QSIG over IP/FR/ATM;
- interworking between, or integration of, the intelligence offered by PISNs and public networks, i.e. between Computer Supported Telecommunication Applications (CSTA) and IN. capabilities;
- impact of teleworking on CN.

7 Objectives

The objective of the project is to get, in the context of corporate telecommunication networks, a complete set of documents (European Standards (ENs) and Technical Reports (TRs)) covering all aspects of inter-operability between multi-vendor elements such as ISPBXs, leased lines, public network capabilities such as VPN (including CENTREX), and interworking with relevant public networks services. The interest of the European Commission in the standardization of these elements is expressed by VPN Task Group Report, TCR/TR 034 [5].

7.1 Phased approach

The CN Project has been set up at a time when work based on a precursor project (i.e. M-IT-05) has already achieved an advanced status. Numerous documents under the classical headers "Private Telecommunication Networks (PTN)" and "Business Telecommunications" are already approved or at least in an advanced drafting state.

7.2 First set of milestones

7.2.1 Milestone 0: Review of existing work items

Thus, the CN Project had to start with a bottom-up approach work, i.e. the collection of existing work items, irrespective of their status (i.e. whether they were already finalized or still in progress or even not yet started). This activity reflects Milestone 0 (Status: Finalized).

7.2.2 Milestone 1: CN Taxonomy

The next step was the top-down approach identification of necessary, not yet planned work items.

To ease this a loan was taken by the "old" ITAEG-T planning tool which consisted of a taxonomy structured overview of standardization activities.

The CN Taxonomy is structured in a decadic, in principle open-ended, classification of standardization subjects, see annex C. Each end-point of the "branches" or "twigs" can be split into sub-branches or sub-twigs if and when this becomes necessary. The taxonomy approach thus provides two advantages:

- logical order within a decadic structure;
- flexibility for enhancements (or reductions) at any time.

The CN Taxonomy expands on those branches and twigs where high standardization activities are expected, and it refrains from splitting where no standardization activities are expected, at least not at this time. This latter applies, e.g., to a certain degree to the area of data communication. The reason for this is in the fact that a number of CN solutions are already on the market, based on the use of dedicated data networks.

Currently, the CN Taxonomy contains some 400 twigs. Of these some 100 are "blind", i.e. the corresponding subject does not indicate a distinct work item but a heading. As an example: "supplementary services" is a heading (main-twig), followed by some 20 work items (twigs) such as Name Identification, Call Diversion, etc.

The establishment of the CN Taxonomy reflects Milestone 1 (Status: Finalized, except for its maintenance).

7.2.3 Milestone 2: Planning Tool

The relatively high number (over 400) of expected work items requires a planning tool for their management. The CN Planning Tool consists of the CN Taxonomy plus additional information from the ETSI Database and some Project-specific information.

The CN Taxonomy has been cast into a database, with the twig and main-twig numbers ("Clauses") acting as a primary key. This guarantees that no two or more entries can be accommodated under the same twig number (should this become necessary, the twig would be split into the next lower decadic level).

The clauses are linked with the work items of the ETSI Database: Work Program Management data base. This linkage allows to import from the SMDB a large amount of relevant information such as Title (if the subject has already materialized in an ETSI document), Status, Target Dates, Responsible TC/STC, etc.

CN Project-specific information consists of entries such as Project Status and target dates required from the Project. For easier handling the planning tool has been structured according to the ECMA/ETSI infrastructure (structure of ETSI/ECMA committees).

NOTE: In so far the planning tool is also relevant to JEEC.

The planning tool has been discussed with the most affected TCs, i.e. BTC and its STCs, and ECMA TC32 and its Task Groups.

The flexibility of the CN Planning Tool allows the production of information filtered, selected and sorted under various aspects as needed for:

- status lists;
- list of work items to be created, or to be stopped (if obsolete);
- list of work items according to target dates;
- etc.

The establishment of the CN Planning Tool reflects Milestone 2 (Status: Finalized, except for the updates of its entries).

7.2.4 Milestones 3, 4 and 5: VPN

The base document for clarification in the whole area is the VPN Task Group report ([3]).

Milestone 3 corresponds to the initialization of activities to be performed by TC SPS, and Milestone 4 to those of TC NA. These milestones have been finalized at end 1995, see annex F.

Further Project activities consist of monitoring the work in the STCs of both TCs. These will be defined later.

Milestone 5 corresponds to the revised version of the VPN Task Group report and its approval as a TCR-TR 034 [3], 2nd edition, in March 1996 (TCC 22).

7.2.5 Milestone 6: CN Mobility

A first set of PUM and CN-CTM standards were completed in November 1995.

The status of milestone 6 is: finalized.

7.2.6 Milestone 7: High-speed/LAN

Currently this work focuses only on the employment of ATM technology in CNs (B-PISN). Work on B-PISNs has been started in ECMA TC32. This covers the specification of B-PISN architecture and B-PISN addressing issues, of the B-PISN basic call (stages 1, 2 and 3 at the Q reference point), the adaptation of the QSIG generic functional procedures to B-PISN, and the specification of the QSIG-SAAL.

They are closely related to ITU-T and the ATM Forum. International standardization is pursued at ISO/IEC JTC1/SC6.

7.3 Further Milestones

Further milestones will cover the remaining areas.

7.3.1 Milestone 8: Working results of PT85

Milestone 8 (finalized at the end of 1996) refers to the complete working results of PT85 which result in further milestones. The working results are reflected in two ETSI Guides:

- CN Standardization analysis; Part 1: Strategy [7];
- CN Standardization analysis; Part 2: Enhanced voice and non-voice services [8].

7.3.2 Milestone 9: List of Requirement Items

Milestone 9 (target date: end of 1998) relates to the list of work items proposed in EG 201 026-1 [7] and EG 201 026-2 [8].

7.3.3 Milestone 10: CNs - Standardization analysis: Part 3: VPN (Draft EG 201 026-3)

Milestone 10 (estimated finalization end 1997) relates to a further part of the CNs - Standardization analysis: Part 3: VPN [9].

7.3.4 Milestone 10a: Specification of relevant Standards for Milestone 10

The target date for milestone 10a has not yet been determined.

7.3.5 Milestone 11: CNs - Standardization analysis - Part 4: CN Mobility (Draft EG 201 026-3)

Milestone 11 (estimated finalization end 1997) relates to a further part of the CNs - Standardization analysis: Part 4: CN Mobility [9].

7.3.6 Milestone 11a: Specification of relevant Standards for Milestone 11

The target date for milestone 11a has not yet been determined.

7.3.7 Milestone 12: CN-High-Speed/LAN

Milestone 12 on CN-High-Speed/LAN has been identified (target end 1998).

7.3.8 Milestone 13: CN Performance

Milestone 13 on CN Performance has been identified (target end 1997).

7.3.9 Milestone 14: CN Scenarios

Milestone 14 on CN Scenarios has been identified (target end 1998).

7.3.10 Milestone 15: CN Management

Milestone 15 on CN Management has been identified (target end 1998).

7.3.11 Milestone 16: Internationalization of European Standards

A further Milestone 16 has been identified to co-ordinate and monitor ETSI and ECMA deliverables to become international standards or technical reports (ISO/IEC JTC1/SC6). This is an ongoing issue.

8 Justification

There is a strong market need for meeting requirements of corporations, end-users, CN managers, service providers (typically public network operators) and equipment suppliers, under their individual perspectives, for corporate telecommunication networks. In the modern economy world the globalization of corporative activities becomes more and more important. This is not only restricted to Europe, but is of world-wide significance.

Standardization in the CN field needs to ensure inter-connectivity and inter-operability between all CN elements and externally provided ("out-sourced") services, thereby taking account of international multi-vendorship in an international competitive environment.

9 Time schedule

The planned time to reach the satisfactory completion of the standardization process based on the current requirements in SRC5 Report, is 3 years for the development of a first set of ETSSs.

NOTE: However due to the need for world-wide CNs requiring world-wide inter-connectivity and inter-operability, international standards (ISO/IEC JTC1 and ITU-T) are the ultimate target. This may result in additional time at the end of which European Standards (ENs) will have to be aligned with the outcome of the international standardization areas.

The detailed schedule for milestones is:

- Milestone 0: June 1994.
- Milestone 1: August 1994.
- Milestone 2: January 1995.
- Milestone 3: November 1995.
- Milestone 4: July 1995.

- Milestone 5: end 1995.
- Milestone 6: end 1995.
- Milestone 7: end 1996.
- Milestone 8: end 1996.
- Milestone 9: end 1998.
- Milestone 10: end 1997.
- Milestone 11: end 1997.
- Milestone 12: end 1998, for further study.
- Milestone 13: end 1997.
- Milestone 14: end 1998;
- Milestone 15: end 1998, for further study.
- further milestones to be defined.

10 Global context

Work related to CN standardization is also going on in organizations outside Europe, e.g. in ITU-T and in ISO/IEC JTC1. An overview of the most important subjects will be provided in the course of maintaining the EG. A first overview is given hereafter.

10.1 ITU-T

VPN activities have been taken up in SG11. They are focusing on the signalling aspects linked with the T+ reference point concept, see figure 2. The idea is to design a new protocol (called DSS1+) which is compatible with DSS1 and allows to distinguish between public ISDN and intra-VPN calls. For the latter the integrity of the corporate network signalling ("QSIG") information flows will be preserved.

10.2 ISO/IEC JTC1

Within the joint technical committee #1 of ISO and IEC, subcommittee SC6 is engaged in private network/corporate network standardization. A considerable number of European standards has been adopted as international standards, in many cases without substantial modifications.

10.3 Co-operation between ITU-T and JTC1

Co-operation has been established between ITU-T SG 11 and JTC1/SC6 on the specification of VPN.

10.4 Global Virtual Network Service (GVNS) Forum

The GVNS Forum promotes the standard of GVNS which is a global switched service supported by multiple (public) networks and which is offered to customers over PSTN and/or ISDN. While minimizing the need for dedicated network resources, GVNS provides private network functions to users at geographically dispersed (international) locations, ITU-T Draft Recommendation F.16, ITU-T Draft Recommendation Q 85.5 and ITU-T Draft Recommendation Q 735.6.

10.5 Telecommunication Industry Association (TIA), USA

Liaison with TIA has been established in the area of CN transmission aspects. Work is proceeding to define a common set of definitions and terminology. The work may be extended to cover transmission planning for PBX networks and for trans-Atlantic corporate networks

10.6 Other standardization bodies

There are numerous national and regional standardization bodies around the world which specify partial aspects of CNs, mainly limited to data transmission. However, interest in voice communication is growing and needs to be carefully monitored.

Further drafts of the CN Project Plan may provide additional information on these activities.

11 Resource requirements

The following committees are considered to be involved in the European environment (ETSI and ECMA):

TC	WG
CN PC	WGs 1 - 7
NA	NA1, NA2, NA6, ECTM
SPS	SPS1, SPS2, SPS3, SPS5
TM	TM2
ECMA TC32	TG12, TG13, TG14, TG15
HF	HF1

Annex A: Terms of Reference for CN Project Management

The CN Project Manager is empowered to further investigate the feasibility and the priorities of the following:

- To manage and co-ordinate the standardization process for in close co-operation with the EP CN Chairman.
- To define work areas and content of standardization work programme for EP CN approval and to give visibility of the Work Programme to external bodies.
- To follow consultation, to allocate in detail the specifications drafting work to appropriate ETSI committees, according to the guidance given by the Board, OCG or JEEC.
- To propose a set of sub-projects, where appropriate, taking into account already existing management groups.
- To manage technical coherence between the various committees and to ensure the formation of consensus on each draft specification.
- To contact Chairmen of competence centers etc. involved to monitor progress - i.e. the achievement of milestones - and take relevant actions to ensure timely completion.
- To report to EP CN.
- To work in close co-operation with the EP CN Support Team recruited from CN Working Groups membership and, where appropriate, with the EP CN Management etc.
- To work in close co-operation with the ETSI Secretariat in order to keep the ETSI database updated with regard to the ETSI Programme of Work to draw the necessary links between milestones of related work items.

NOTE 1: Administrative support from the ETSI Secretariat will be needed.

NOTE 2: Updated in accordance with edition 3 of CN (97) 01.

Annex B: CN Taxonomy

Where possible, the CN-Taxonomy shows cross-references with the Standardization Work Areas (SWAs) of the ETSI Programme Advisory Group (PAG). See ETSI/TA20(94)8.

This edition of the CN Taxonomy includes the proposals made by PT85.

Com_Clause		Common Set of Services	Milestone
1	General	""	
1.1	Taxonomy Document on possible PISN Standards	""	1
1.2	PISN Glossary of Terms	""	
1.3	Guidelines and Methods	""	
1.3.1	Methods for the Specification of Basic Services and Supplementary Services	""	
1.3.2	CCITT/ITU-T Recs. and other standards applicable for PISNs	""	
1.3.3	Code of practice for network planning	""	
1.3.4	Application of Quality of Standards criteria to CN	""	
1.3.5	CN service entry points (SEP)	""	
1.3.6	Systematic method for determining the extent of interoperability	""	
1.4	Functional requirements	""	
1.4.1	General principles and service aspects (ECMA-TR/57)	""	
1.4.2	Vision of a CN in the year 2005	""	
1.4.3	Common minimum set of services with full interoperability in a CN	""	
2	Services	""	
2.1	Stage 1	""	
2.1.1	Basic Services	""	
2.1.1.1	Bearer services	""	
2.1.1.1.1	Circuit-mode 64 kbit/s unrestricted	""	
2.1.1.1.2	Circuit-mode 64 kbit/s unrestricted with tones and announcements (T/A)	""	
2.1.1.1.3	Circuit-mode 3,1 kHz audio	""	
2.1.1.1.4	Circuit-mode speech	""	
2.1.1.1.5	Multi-rate bearer service	""	
2.1.1.1.6	Packet mode	""	
2.1.1.1.7	Frame mode	""	
2.1.1.1.8	Cell mode (ATM)	""	
2.1.1.2	Teleservices	""	
2.1.1.2.1	7 kHz telephony	""	
2.1.1.2.2	Videotelephony	""	
2.1.2	Supplementary Services, Overview Document	""	
2.1.2.1	Number Identification services (ISSD)	""	
2.1.2.2	Name Identification services (NA-SD)	""	
2.1.2.3	Call Forwarding (CF-SD)	""	
2.1.2.4	Call Transfer (CT-SD)	""	
2.1.2.5	Call Priority Interruption (CPISD)	""	
2.1.2.6	Call Completion CCBS/CCNR (CC-SD)	""	
2.1.2.7	Do Not Disturb (Override)(DND(O)-SD)	""	
2.1.2.8	Call Offer (CO-SD)	""	
2.1.2.9	Call Intrusion (CI-SD)	""	
2.1.2.10	Advice of Charge (AOC-SD)	""	
2.1.2.11	Conference CONF	""	
2.1.2.12	In-Call Modification IM (IM-SD)	""	
2.1.2.13	User-to-user Signalling UUS	""	
2.1.2.14	Night Service (NS-SD)	""	
2.1.2.15	Serial Call (SESD)	""	
2.1.2.16	Call Distribution to Attendant (CDA-SD)	""	
2.1.2.17	Recall (RESD)	""	
2.1.2.18	Additional Information Presentation (AIPSD)	""	
2.1.2.19	Message Waiting Indication (MWISD)	""	
2.1.3	Additional Network Features, Overview Document	""	
2.1.3.1	Path Replacement	""	
2.1.3.2	Source Routeing	""	
2.1.3.3	Route Restriction	""	
2.1.3.4	Alternate Routeing indication	""	
2.1.3.5	Common information interchange (ANF CMNSD)	""	
2.1.3.6	Call Interception (ANF-CINTSD)	""	
2.1.3.7	Transit Counter (ANF-TCSD)	""	
2.1.4	Multi-Vendor Attendant Services (MPASD)	""	
2.2	Stage 2 Description	""	
2.2.1	Basic Services	""	
2.2.1.1	Bearer services	""	

2.2.1.1.1	Circuit-mode 64 kbit/s unrestricted	""	
2.2.1.1.2	Circuit-mode 64 kbit/s unrestricted with tones and announcements (T/A)	""	
2.2.1.1.3	Circuit-mode 3,1 kHz audio	""	
2.2.1.1.4	Circuit-mode speech	""	
2.2.1.1.5	multi-rate	""	
2.2.1.1.6	Packet mode	""	
2.2.1.1.7	Frame mode	""	
2.2.1.1.8	Cell Mode (ATM)	""	
2.2.1.2	Teleservices	""	
2.2.1.2.1	7 kHz telephony	""	
2.2.1.2.2	Videotelephony	""	
2.2.2	Supplementary Services	""	
2.2.2.1	Number identification	""	
2.2.2.2	Name Identification	""	
2.2.2.3	Call Forwarding	""	
2.2.2.4	Call Transfer	""	
2.2.2.5	Call Priority Interruption (CPISD)	""	
2.2.2.6	Call Completion CCBS/CCNR (CC-SD)	""	
2.2.2.7	Do Not disturb (Override) DND/DNDO	""	
2.2.2.8	Call Offer	""	
2.2.2.9	Call Intrusion (CI-SD)	""	
2.2.2.10	Advice of Charge	""	
2.2.2.11	Conference CONF	""	
2.2.2.12	In-Call Modification IM	""	
2.2.2.13	User-to-user Signalling UUS	""	
2.2.2.14	Night Service	""	
2.2.2.15	Serial Call (SESD)	""	
2.2.2.16	Call Distribution to Attendant (CDASD)	""	
2.2.2.17	Recall (RESD)	""	
2.2.2.18	Additional Information Presentation (AIPSD)	""	
2.2.2.19	Message Waiting Indication (MWISD)	""	
2.2.3	Additional Network Features (ANFs)	""	
2.2.3.1	Path Replacement	""	
2.2.3.2	Source Routeing	""	
2.2.3.3	Route Restriction	""	
2.2.3.4	Alternate Routeing indication	""	
2.2.3.5	Common Information Interchange (ANF CMNSD)	""	
2.2.3.6	Call Interception (ANF-CINTSD)	""	
2.2.3.7	Transit Counter (ANF-TCSD)	""	
2.2.4	Multi-Vendor Attendant Services (MPASD)	""	
2.3	Stage 3 Descriptions	""	
3	User-Network Interfaces (S Reference Point, Signalling Issues)	""	
3.1	Layer 1	""	
3.1.1	Basic rate access	""	
3.1.2	Primary rate access	""	
3.2	Layer 2	""	
3.2.1	Circuit mode type N-PISN	""	
3.2.2	Signalling ATM Application Layer (SSIG-SAAL)	""	
3.3	Layer 3	""	
3.3.1	Basic call	""	
3.3.1.1	Circuit mode (SSIG-BC)	""	
3.3.1.2	Packet mode	""	
3.3.1.3	Frame mode	""	
3.3.1.4	Cell mode (ATM)	""	
3.3.2	Generic functional procedures	""	
3.3.2.1	Generic functional procedures for N-PISN	""	
3.3.2.2	Generic functional procedures for B-PISN	""	
3.3.3	Key-Pad Stimulus Procedures (SSIG-KP)	""	
3.3.4	Feature Key Stimulus Procedures (SSIG-FK)	""	
3.3.5	Supplementary Services	""	
3.3.5.1	Number Identification services (SSIG-ID)	Yes	
3.3.5.2	Name Identification services	""	
3.3.5.3	Call Forwarding	Yes	
3.3.5.4	Call Transfer	Yes	
3.3.5.5	CCBS/CCNR	Yes	
3.3.5.6	DND/DNDO	""	
3.3.5.7	Call Offer	""	
3.3.5.8	Call Intrusion	""	
3.3.5.9	Advice of Charge	""	
3.3.5.10	Conference	Yes	
3.3.5.11	Incall Modification	""	
3.3.5.12	UUS	Yes	
3.3.5.13	Night Service	""	

3.3.5.14	Serial Call	""	
3.3.5.15	Call Distribution to Attendant	""	
3.3.5.16	Recall	""	
3.3.5.17	Additional Information Presentation	""	
3.3.5.18	Message Waiting Indication	Yes	
3.3.5.19	Call Priority Interruption	""	
3.3.6	Additional Network Features (ANFs)	""	
3.3.7	Protocol Profiles / Behaviour Guidelines	""	
3.3.7.1	Euro-ISDN TE connected to a PINX	""	
3.3.8	Mobility Support	""	
3.3.8.1	Incoming CTM Call Handling ANF (SSIG-CTMI)	""	
3.3.8.2	Outgoing CTM Call Handling ANF (SSIG-CTMO)	""	
3.3.8.3	Location Registration (SSIG-CTLR)	""	
3.3.8.4	Cordless Terminal Authentication (SSIG-CTAU)	""	
4	Intra-Network Interfaces (Q Reference Point, Signalling Issues)	""	
4.1	Layer 2	""	
4.1.1	Circuit mode type IVN	""	
4.1.2	Signalling ATM Application Layer (QSIG-SAAL)	""	
4.2	Layer 3 protocols	""	
4.2.1	Basic call	""	
4.2.1.1	Circuit mode (QSIG-BC)	""	
4.2.1.2	Packet mode	""	
4.2.1.3	Frame mode	""	
4.2.1.4	Cell mode (ATM) (B-QSIG-BC)	""	
4.2.2	Generic functional procedures	""	
4.2.2.1	Generic functional procedures for N-PISN (N-QSIG-GF)	""	
4.2.2.2	Generic functional procedures for B-PISN (B-QSIG-GF)	""	
4.2.3	Supplementary services	""	
4.2.3.1	Number Identification services	""	
4.2.3.2	Name Identification services (QSIG-NA)	""	
4.2.3.3	Call Forwarding (QSIG-CF)	""	
4.2.3.4	Call Transfer (QSIG-CT)	""	
4.2.3.5	CCBS/CCNR (QSIG-CC)	""	
4.2.3.6	DND/DNDO (QSIG-DND(O))	""	
4.2.3.7	Call Offer (QSIG-CO)	""	
4.2.3.8	Call Intrusion (QSIG-CI)	""	
4.2.3.9	Advice of Charge (QSIG-AOC)	""	
4.2.3.10	Conference (QSIG-CONF)	""	
4.2.3.11	Incall Modification (QSIG-IM)	""	
4.2.3.12	UUS (QSIG-UUS)	""	
4.2.3.13	Night Service (QSIG-NS)	""	
4.2.3.14	Serial Call (QSIG-SE)	""	
4.2.3.15	Call Distribution to Attendant (QSIG-CDA)	""	
4.2.3.16	Recall (QSIG-RE)	""	
4.2.3.17	Additional Information Presentation (QSIG-AIP)	""	
4.2.3.18	Message Waiting Indication (QSIG-MWI)	""	
4.2.3.19	Call Priority Interruption (QSIG-CPI)	""	
4.2.3.51	Interactions (QSIG-IA)	""	
4.2.4	Additional Network Features (ANFs)	""	
4.2.4.1	Path Replacement (QSIG-PR)	""	
4.2.4.2	Source Routeing	""	
4.2.4.3	Route Restriction	""	
4.2.4.4	Alternate Routeing indication	""	
4.2.4.5	Common Information Interchange (QSIG-CMN)	""	
4.2.4.6	Call Interception (QSIG-CINT)	""	
4.2.4.7	Transit Counter (QSIG-TC)	""	
4.2.5	Break-IN/Break-OUT	""	
4.2.6	Multi-Vendor Attendant Services	""	
4.2.7	Protocol Profiles / Behaviour Guidelines	""	
4.2.7.1	Two PINXs Connected To One Another (QSIG)	""	
4.2.7.2	Radio Paging Equipment	""	
4.2.8	Mobility Support	""	
4.2.8.1	Incoming CTM Call Handling ANF (QSIG-CTMI)	""	
4.2.8.2	Outgoing CTM Call Handling ANF (QSIG-CTMO)	""	
4.2.8.3	Location Registration (QSIG-CTLR)	""	
4.2.8.4	Cordless Terminal Authentication (QSIG-CTAU)	""	
5	InterNetwork Interfaces	""	
5.1	PISN --- Public ISDN (T Reference Point; Signalling aspects)	""	
5.1.1	Layer 2	""	
5.1.1.1	Circuit mode type ISDN	""	
5.1.2	Layer 3 protocols	""	
5.1.2.1	Basic Call	""	
5.1.2.1.1	Circuit mode (TSIG BC)	""	

5.1.2.1.2	Packet Mode	""	
5.1.2.1.3	Frame mode	""	
5.1.2.1.4	Cell mode (ATM)	""	
5.1.2.2	Generic functional procedures	""	
5.1.2.2.1	Generic functional procedures for N-ISDN (TSIG-GF)	""	
5.1.2.2.2	Generic functional procedures for B-ISDN (TSIG-GF)	""	
5.1.2.3	Supplementary Services	""	
5.1.2.3.1	Number Identification Services	""	
5.1.2.3.1.1	Calling Line Identity Presentation (CLIP)	""	
5.1.2.3.1.2	Calling Line Identity Presentation Restriction (CLIP)	""	
5.1.2.3.1.3	Connected Line Identity Presentation (COLP)	""	
5.1.2.3.1.4	Connected Line Identity Presentation Restriction (COLP)	""	
5.1.2.3.2	Call Forwarding (CF)	""	
5.1.2.3.3	Call Transfer (CT)	""	
5.1.2.3.4	Call Completion	""	
5.1.2.3.4.1	On Busy	""	
5.1.2.3.4.2	On No Reply	""	
5.1.2.3.5	Advice of charge	""	
5.1.2.3.6	Conference	""	
5.1.2.3.7	In-Call Modification	""	
5.1.2.3.8	Closed User Group	""	
5.1.2.4	Protocol Profiles / Behaviour Guidelines	""	
5.1.2.4.1	PINX connected to a Public ISDN at T reference point	""	
6	End-to-End Protocols	""	
6.1	Channel aggregation	""	
7	Network Aspects	""	
7.1	Architecture	""	
7.1.1	Architectural models for PISNs	""	
7.1.2	Reference configurations for PISN	""	
7.1.2.1	Reference configuration for PINX	""	
7.1.2.2	Reference Configuration for HS-PINX	""	
7.1.2.3	Reference Configuration for PINX - Extension Line	""	
7.1.2.4	Reference configuration for PINX - Integrated Scenario	""	
7.1.2.5	Gateway and Interworking aspects	""	
7.1.2.6	Reference configurations for DECT Air Interface	""	
7.2	Network scenarios	""	
7.2.1	Overlay Scenarios, Principles and Classification	""	
7.2.1.1	Functions of IVNs providing circuit mode IPCs leased lines	""	
7.2.1.2	Functions of IVNs providing circuit mode IPCs through public ISDN	""	
7.2.1.3	Functions of IVNs providing circuit mode IPCs through DCC	""	
7.2.1.4	Functions of IVNs providing packet mode IPCs through PSPN or ISDN	""	
7.2.1.5	Functions of IVNs providing packet mode IPCs via UUS	""	
7.2.2	Integrated Scenarios, General	""	
7.2.2.1	Integrated Scenarios, Principles and Classification	""	
7.3	PINX Functions to handle specific Scenarios	""	
7.3.1	Specific scenarios descriptions, Overview (TR/Mapping)	""	
7.3.1.1	Functions corresponding to IVNs providing circuit mode IPCs circuit mode (CM)	""	
7.3.1.1.1	Static type IVNs	""	
7.3.1.1.2	Dynamic type IVNs	""	
7.3.1.2	Functions corresponding to IVNs providing packet mode IPCs (X.25-like)	""	
7.3.1.3	Functions corresponding to IVNs providing packet mode IPCs (UUS-based)	""	
7.4	Open Network Provisions for PISNs	""	
7.4.1	Leased lines	""	
7.4.1.1	Detailed Specifications	""	
7.4.1.1.1	Network Interface Presentation	""	
7.4.1.1.1.1	2048 kbit/s digital unstructured (D2048U)	""	
7.4.1.1.1.2	2048 kbit/s digital structured (D2048S)	""	
7.4.1.1.1.3	64 kbit/s unstructured (D64U)	""	
7.4.1.1.1.4	Ordinary 2-wire leased line (A20)	""	
7.4.1.1.1.5	Special Quality 2-wire leased line (A2S)	""	
7.4.1.1.1.6	Ordinary 4-wire leased line (A40)	""	
7.4.1.1.1.7	Special Quality 4-wire leased line (A4S)	""	
7.4.1.1.1.8	34 Mbit/s digital structured leased line (D34S)	""	
7.4.1.1.1.9	140 Mbit/s digital structured leased line (D140S)	""	
7.4.1.1.1.10	n*64 kbit/s	""	
7.4.1.1.2	Connection Characteristics	""	
7.4.1.1.2.1	2048 kbit/s digital unstructured (D2048U)	""	
7.4.1.1.2.2	2048 kbit/s digital structured (D2048S)	""	
7.4.1.1.2.3	64 kbit/s unstructured (D64U)	""	
7.4.1.1.2.4	Ordinary 2-wire leased line (A20)	""	
7.4.1.1.2.5	Special Quality 2-wire leased line (A2S)	""	
7.4.1.1.2.6	Ordinary 4-wire leased line (A40)	""	
7.4.1.1.2.7	Special Quality 4-wire leased line (A4S)	""	

7.4.1.1.2.8	34 Mbit/s digital structured leased line (D34S)	""	
7.4.1.1.2.9	140 Mbit/s digital structured leased line (D140S)	""	
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7.8.2.1.2.3.1	Protocol at the T+ and the C reference points	""	
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7.8.3.1.3.2	Security/Authentication	""	
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8.3.1.1.5	Remote Access for Mobile Users	""	
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8.3.1.2	PISN User Mobility (PUM)	""	
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8.3.2.1.2	Cordless Terminal Mobility - Handover	""	
8.3.2.1.3	Cordless Terminal Mobility - Call Handling Procedures	""	
8.3.2.1.4	Cordless Terminal Mobility - Authentication	""	
8.3.2.1.5	Remote Access for Mobile Users	""	
8.3.2.1.6	Signalling Enquiry ANF	""	
8.3.2.2	PISN User Mobility (PUM)	""	
8.3.2.2.1	PISN User Mobility - dynamic registration	""	
8.3.2.2.2	PISN User Mobility - Call Handling Procedures	""	
8.4	Service and ANF Descriptions for multiple networks	""	
8.4.1	Stage 1 Descriptions for Suppl. Services and Additional Network Features (ANFs)	""	
8.4.1.1	Cordless Terminal Mobility (CTM)	""	
8.4.1.1.1	Cordless Terminal Mobility - Roaming (Location Handling)	""	
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8.4.1.1.4	Cordless Terminal Mobility - Authentication	""	
8.4.1.2	PISN User Mobility (PUM)	""	
8.4.1.2.1	PISN User Mobility - dynamic registration	""	
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8.4.2.1	Cordless Terminal Mobility (CTM)	""	
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8.4.2.2.1	PISN User Mobility - dynamic registration	""	
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9	High Speed/LAN	""	
9.1	General	""	
9.1.1	Architectural Aspects	""	
9.1.2	Reference Configuration	""	
9.1.3	Operational and Interconnection Aspects	""	
10	CN Network Management	""	
10.1	General	""	
10.1.1	Management Framework	""	
10.1.2	Guidelines for the definition of managed objects	""	
10.1.3	Information modelling	""	
10.1.3.1	Networking Scenarios	""	
10.1.3.2	Managed Element Interfaces (MMEI)	""	
10.1.4	Interworking public/private network	""	
10.1.5	Billing Information Interface	""	
10.2	Management Services	""	
10.3	Management Protocols	""	
10.3.1	SNMP	""	
10.4	Real Parts	""	
10.5	Outsourced Parts	""	
10.6	Security	""	
11	CN Performance	""	
11.1	General	""	
11.2	Performance of the VPN	""	
11.2.1	Transit Node	""	
11.2.2	End Node (Centrex)	""	
11.3	Overall Performance	""	
11.3.1	Voice	""	
11.3.1.1	General	""	
11.3.1.2	Loudness Rating	""	
11.3.2	Data	""	
11.3.2.1	General	""	
11.3.2.2	Packet Mode Services (X.31 case B and dedicated networks)	""	
11.3.2.3	Frame Mode Services (ISDN, B-ISDN, and dedicated networks)	""	
11.4	Portion boundaries, reference connections and reference events	""	
12	CN Human Factor Aspects (HF)	""	
12.1	Man Machine Interface (MMI)	""	
12.1.1	Control of Services	""	
12.2	Audible and Visible Indications	""	
12.2.1	Tones	""	
12.2.2	Announcements	""	
12.2.3	Visible Indications	""	
13	Demonstration of Interoperability (Testing)	""	
13.1	Formal (conformance) Testing	""	
13.1.1	User-Network Interfaces (S Reference Point)	""	
13.1.2	Intra-Network Interfaces (Q / C Reference Points)	""	
13.1.2.1	Layer 1	""	
13.1.2.2	Layer 2	""	
13.1.2.3	Layer 3	""	
13.1.2.3.1	Basic Call	""	
13.1.2.3.1.1	Circuit mode (QSIG-BC) Test Suite	""	
13.1.2.3.1.2	Circuit mode (DSS1+ - BC) Test Suite	""	
13.1.2.3.2	Generic functional procedures	""	
13.1.2.3.2.1	Generic functional procedures for N-PISN (QSIG-GF) Test Suite	""	
13.1.2.3.2.2	Generic functional procedures for N-PISN (DSS1+ -GF) Test Suite	""	
13.1.2.3.3	Supplementary Services Test Suites (QSIG)	""	
13.1.2.3.3.1	Number Identification services	Yes	
13.1.2.3.3.2	Name Identification services (QSIG-NA)	""	
13.1.2.3.3.3	Call Forwarding (QSIG-CF)	Yes	
13.1.2.3.3.4	Call Transfer (QSIG-CT)	Yes	
13.1.2.3.3.5	CCBS/CCNR (QSIG-CC)	Yes	
13.1.2.3.3.6	DND/DNDO (QSIG-DND(O))	""	
13.1.2.3.3.7	Call Offer (QSIG-CO)	""	
13.1.2.3.3.8	Call Intrusion (QSIG-CI)	""	
13.1.2.3.3.9	Advice of Charge (QSIG-AOC)	""	
13.1.2.3.3.10	Conference (QSIG-CONF)	Yes	
13.1.2.3.3.11	Incall Modification (QSIG-IM)	""	
13.1.2.3.3.12	UUS (QSIG-UUS)	Yes	
13.1.2.3.3.13	Night Service (QSIG-NS)	""	

13.1.2.3.3.14	Serial Call (QSIG-SE)	""	
13.1.2.3.3.15	Call Distribution to Attendant (QSIG-CDA)	""	
13.1.2.3.3.16	Recall (QSIG-RE)	""	
13.1.2.3.3.17	Additional Information Presentation (QSIG-AIP)	""	
13.1.2.3.3.18	Message Waiting Indication (QSIG-MWI)	Yes	
13.1.2.3.3.19	Call Priority Interruption (QSIG-CPI)	""	
13.1.2.3.3.20	Interactions (QSIG-IA)	""	
13.1.2.3.4	Additional Network Features (ANFs) Test Suites (QSIG)	""	
13.1.2.3.4.1	Path Replacement (QSIG-PR)	""	
13.1.2.3.4.2	Source Routeing	""	
13.1.2.3.4.3	Route Restriction	""	
13.1.2.3.4.4	Alternate Routeing indication	""	
13.1.2.3.4.5	Common Information Interchange (QSIG-CMN)	""	
13.1.2.3.4.6	Call Interception (QSIG-CINT)	""	
13.1.2.3.4.7	Transit Counter (QSIG-TC)	""	
13.1.3	InterNetwork Interfaces	""	
13.1.3.1	PISN --- Public ISDN (T Reference Point)	""	
13.1.3.2	PISN --- VPN (C Reference Point)	""	
13.1.3.2.1	QSIG	""	
13.1.3.2.2	DSS1+	""	
13.1.3.2.3	VPN --- VPN (N* Reference Point)	""	
13.2	Interoperability Testing	""	
13.2.1	Functional Test Purposes To Demonstrate End-To-End Interoperability	""	
13.2.1.1	Between TEs Attached At S Reference Points	""	
13.2.1.1.1	Basic Call	""	
13.2.1.1.2	Number Identification services	Yes	
13.2.1.1.3	Name Identification services	""	
13.2.1.1.4	Call Forwarding	Yes	
13.2.1.1.5	Call Transfer	Yes	
13.2.1.1.6	CCBS/CCNR	Yes	
13.2.1.1.7	DND/DNDO	""	
13.2.1.1.8	Call Offer	""	
13.2.1.1.9	Call Intrusion	""	
13.2.1.1.10	Advice of Charge	""	
13.2.1.1.11	Conference	Yes	
13.2.1.1.12	Incall Modification	""	
13.2.1.1.13	UUS	Yes	
13.2.1.1.14	Night Service	""	
13.2.1.1.15	Serial Call	""	
13.2.1.1.16	Call Distribution to Attendant	""	
13.2.1.1.17	Recall	""	
13.2.1.1.18	Additional Information Presentation	""	
13.2.1.1.19	Message Waiting Indication	Yes	
13.2.1.1.20	Call Priority Interruption	""	
13.2.1.2	Between TEs Attached At An S Reference Point And At A Coincident S/T Reference Point	""	
13.2.1.2.1	Basic Call	""	
13.2.1.2.2	Number Identification services	Yes	
13.2.1.2.3	Name Identification services	""	
13.2.1.2.4	Call Forwarding	Yes	
13.2.1.2.5	Call Transfer	Yes	
13.2.1.2.6	CCBS/CCNR	Yes	
13.2.1.2.7	DND/DNDO	""	
13.2.1.2.8	Call Offer	""	
13.2.1.2.9	Call Intrusion	""	
13.2.1.2.10	Advice of Charge	""	
13.2.1.2.11	Conference	Yes	
13.2.1.2.12	Incall Modification	""	
13.2.1.2.13	UUS	Yes	
13.2.1.2.14	Night Service	""	
13.2.1.2.15	Serial Call	""	
13.2.1.2.16	Call Distribution to Attendant	""	
13.2.1.2.17	Recall	""	
13.2.1.2.18	Additional Information Presentation	""	
13.2.1.2.19	Message Waiting Indication	Yes	
13.2.1.2.20	Call Priority Interruption	""	

Annex C:

Circular Letter 1053 on private network standardization

Summary

ETSI has signed contracts with external bodies with regard to its responsibility on private network standardization.

It is necessary that the existence of these contracts and their impact on the daily work in ETSI are made aware to ETSI officials (TC Chairmen, STC Chairmen, etc.) and member delegates, since these contracts bind the whole of ETSI with this regard.

It is also necessary that ETSI officials and member delegates **respect these contracts in all their ETSI activities**.

C.1 Contracts

These contracts are:

- 1) ETSI committed to accept Bons de Commande IT-74 to IT-77 [2].
- 2) The settlement of the Private Telecommunications Network Field between CENELEC, ETSI and ECMA (16.1.1991).
- 3) The Agreement on Co-operation in the Work Activity for Standardization in the Field of Telecommunications (26.4./2.5.1991), between ETSI and ECMA establishing JEEC, a decisive joint ECMA/ETSI committee.
- 4) The JEEC decisions.
- 5) Liaison with ISO/IEC JTC1.
- 6) Agreement between ETSI and CEN on the conversion of International Standards produced by JTC1/SC6/WG6 into ETSs.

C.1.1 Bons de Commande

The Bons de Commande cover private networks and their components, and define

- private networks can consist of PABXs and/or private network services offered by the public telecommunication networks;
- this includes subjects like VPN and CENTREX.

The Bons de Commande require the production of standards for:

- private network architecture, numbering, routing, methodology;
- basic and supplementary private network services, down to protocol level at the terminal interface and at the interface between PINXs;
- interworking of services with those of public networks and vice versa;
- performance within private networks and for overall-connections passing through public and private networks.

ETSI committed on the Bons de Commande at ITSTC.

C.1.2 The settlement of the Private Telecommunications Network field between CENELEC, ETSI and ECMA

This contract endorses the above commitment according to 1.1 binding to ETSI. In particular, it puts an onus on **all TCs** to take care of interworking with private networks.

C.1.3 The co-operation agreement between ETSI and ECMA

Within the framework of 1.2, ETSI stepped into the co-operation agreement which ECMA had with CENELEC. This required that the allocation of work between ETSI and ECMA be under the control of a common parity committee. As a consequence the Joint ECMA/ETSI Committee (JEEC) has been founded. JEEC's work includes, but is not limited to, partitioning of standardization work between ECMA and ETSI.

C.1.4 JEEC Decisions

In principle, JEEC decisions are binding for ETSI and ECMA. Exceptionally, there may be the need for ratification by the ETSI TA and by the ECMA GA.

C.1.5 Liaison with JTC1

ETSI has applied for A liaison with JTC1, the main reason being that ETSI can use JTC1's so called fast track procedure to forward ETSs to be endorsed as International Standards. In order to avoid arguments at international level whether Europe would deserve a single vote only rather than multiple national votes, the fast track procedure shall only be used in very exceptional cases. Since ECMA committed to provide its long standing experience on this subject to JEEC, JEEC has decided that any fast track intention be approved by JEEC before it is actually initiated.

C.1.6 Conversion of International Standards produced by JTC1/SC6/WG6 into ETSs or ENs

In Europe the regular mirror body for JTC1/SC6/WG6 is CENELEC. However, aligned with the contract under 1.2 above, CENELEC has delegated this role to ETSI for the SC6/WG6 part of JTC1. ETSI has, in so far, stepped into the CENELEC/JTC1 arrangements. These require that International Standards developed by SC6/WG6 be converted by ETSI into European Standards, i.e. ETSs or ENs.

C.2 CN Standardization situation in ETSI

Based on 5 years experience in the standardization of private networks/corporate networks in ETSI, a number of problems have been encountered. As the objective of The present document is to draw the attention mainly to the contractors part as mentioned in clause 1, not detailed cases are referred to here.

C.3 Measures to be taken

It is proposed that the following measures be taken:

- 1) The present document shall be distributed by the TC Chairmen through the mailing lists of their TCs and STCs, together with the urgent request that the TC and STC members have to respect the ETSI external and internal contracts for all their ETSI related activities.
- 2) Any activities infringing the contracts ETSI has signed are to be abandoned. If members indicate that they cannot adhere to the contracts, the ETSI Officials are obliged to bring the case up to the TCC Chairman.

Annex D:

Bon de Commande BC-T-326: Standardization Mandate forwarded to CEN/CENELEC/ETSI in the field of information technology and telecommunications

EUROPEAN COMMISSION

DIRECTORATE-GENERAL III

INDUSTRY

Legislation and standardization and telematic networks

Standardization

Brussels, 8 March 1995

KHL/uk/5320-003

DGIII/B/2

M/92

SOGT 94/65.2

SOGITS N 797.2

BC-T-326

DRAFT STANDARDIZATION MANDATE FORWARDED TO CEN/CENELEC/ETSI IN THE FIELD OF INFORMATION TECHNOLOGY AND TELECOMMUNICATIONS

TITLE

Corporate telecommunication Network standardization

PURPOSE

The purpose of this mandate is the establishment of voluntary European Standards covering the elements involved in Corporate telecommunication Networks. These elements include, inter alia, Telecommunication Terminals, Leased Lines, Public Network Services such as Centrex, Virtual Private Networks and Switched Network Infrastructures. The interoperability between private and public domains for the purpose of Corporate telecommunication Networks should also be covered by the standards and the standards should include specifications as to how interoperability of elements conforming to the above standards can be demonstrated.

JUSTIFICATION

This mandate derives from the need to ensure that standards permit the widest possible range of customer facilities in the construction of Corporate telecommunication Networks. This need is clearly spelt out in the Action Plan contained in "Europe and the global information society. Recommendations to the European Council" (The Bangemann Report) under the subchapter: "**Interconnection and Interoperability**".

There is a need to develop further standards in this area due to the various interest groups involved:- network operators, terminal equipment manufacturers and end users. It should be noted that standards involved in this area can straddle both Mandatory and Voluntary regimes and Corporate telecommunication Networks are often world-wide.

ETSI has recognized the importance of this area, which is covered by several Standardization Work Areas. To that effect a mandate, BC-T-245, was launched by the commission to support the conformance testing activities in this area. Under mandate BC-IT-74 - 77 some of the standards for interworking between private and public services have been developed (QSIG etc.).

In order to ensure the timely development of standardization a project management approach is applied to Corporate telecommunication Network standardization.

ORDER

This mandate constitutes in two parts to be implemented consecutively. The first part requires the preparation of an ETSI Technical Report (ETR) with a proposal for a work programme in the area of Corporate telecommunication Network standardization. The second part, based on the options and possibilities identified in the ETR shall require the establishment of European Standards covering elements involved in Corporate telecommunication Networks, and the specifications on how interoperability of the elements conforming to the above standards can be demonstrated.

RECOMMENDATIONS

The need for end users, special interest groups such as the IPNS Forum and industry associations like ECMA should be taken into account. Similarly, the experience of test laboratories and Notified Bodies is vital to the specifications on interoperability demonstration.

PROPOSED SCHEDULE

December 1995	Adoption of ETR
December 1996	Adoption of ETS(s)

ALIGNMENT WITH OTHER INTERNATIONAL WORK

Proposals for Corporate telecommunication Network standardization shall be based on existing standards. In particular, account shall be taken of relevant work done in ETSI/CEN/CENELEC. As Corporate networking is of interregional interest alignment with equivalent activities in other regions, the ITU and in ISO/IEC should be ensured.

STANDSTILL

For the terms of Article 7 of the Directive 83/189/EEC, the standstill applies for the standards developed under this mandate.

PUBLICATION IN THE OFFICIAL JOURNAL

A title and summary in the 9 languages of the Community is required.

Annex E: Bibliography

This annex lists documents providing background information considered helpful for the understanding of the present document.

ITAEG-T M-IT-05.

Settlement of the Private Telecommunication Network Field between CENELEC, ETSI and ECMA (16.1.1991).

The Agreement on Co-operation in the work activity for standardization in the field of telecommunications (6.10.1995), between ETSI and ECMA, establishing JEEC.

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SRC4 Report.

SRC5 Report.

Circular Letter 1053 with attachment "Private Network Standardization". The attachment is reproduced as annex D to this Technical Report.

ETR 076: The ETSI Standards Guide.

ITU-T Draft Recommendation F.16: "Stage 1 Description for Global Virtual Network Services".

ITU-T Draft Recommendation Q.85.5: "Stage 2 Description for community of interest supplementary services, Global Virtual Network Services".

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SRC6 Report.

History

Document history		
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