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Intelligent Network (IN) - Service provider access requirements - Enhanced telephony services

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Contents

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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

1 Scope

The present document lists the first set of access requirements that Service Providers (SPs) have in delivering services over one or more Public Telecommunications Networks (PTNs), primarily fixed PTNs, e.g. Public Switched Telecommunications Networks (PSTNs) and Integrated Services Digital Networks (ISDNs). These requirements are intended to facilitate a non-discriminatory access to the PTNs. The present document does not fully take into account the network integrity, security, charging, and other related aspects from a PTNO's perspective. These aspects are defined in EG 201 807 [4]. The present document and EG 201 807 [4], should not be considered separately for implementation.

The scope of the present document is to present generic functional requirements regarding the Service Provider Access (SPA). The priority of each requirement is based on the need perceived from the SP's viewpoint. Service interaction aspects are outside the scope of the present document.

To fulfil these requirements, appropriate protocols may have to be enhanced or developed based on information flows and taking into account network integrity considerations expressed in the present document.

Clause 4 contains introductory text describing the background and motivations of the requirements of a SPA. Clause 5 contains a summary of requirements regarding the Service Provider Access Interface (SPAI) and a framework that helps the reader to get an overview. Clause 6 contains a description of the requirements concerning the Circuit-Related (CR) aspects of the SPAI, and clause 7 contains the requirements regarding the non-circuit-related (NCR) aspects. Clause 8 contains information on the architectural view of the SP access.

The present document relates to the role of the SP and the role of the Public Telecommunications Network Operator (PTNO), with the realization that market players may act in multiple roles. This is in alignment with the current European legislation, which specifies that all capabilities utilized by a Significant Market Power (SMP) network operator's internal service provisional body, shall also be offered on equal terms to external entities.

2 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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] ETSI ETR 322: "Intelligent network (IN); Vocabulary of terms and abbreviations for CS-1 and CS-2".

[2] ETSI ETS 300 089 (1992): "Integrated Services Digital Network (ISDN); Calling Line Identification Presentation (CLIP) supplementary service; Service description".

[3] ETSI ETR 339 (1997): "Intelligent Network (IN); IN interconnect business requirements".

[4] EG 201 807: "Network Aspects (NA); Network intelligence; Network Operators' requirements for the delivery of Service Provider Access".

[5] ETSI TR 101 365: "Intelligent Network (IN); IN interconnect threat analysis".

[6] ETSI TR 101 664: "Intelligent Network (IN); IN interconnect security features".

[7] ETSI ETS 300 128 (1992): "Integrated Services Digital Network (ISDN); Malicious Call Identification (MCID) supplementary service; Service description".

[8] ETSI ETS 300 200 (1994): "Integrated Services Digital Network (ISDN); Call Forwarding Unconditional (CFU) supplementary service; Service description".

[9] Directive 98/10/EC of the European Parliament and Council of 26 February 1998 on the application of Open Network Provisions to voice telephony and on universal service for telecommunications in a competitive environment.

[10] Directive 97/33/EC of the European Parliament and Council of 30 June 1997 on interconnection in telecommunications with regard to ensuring universal service and interoperability through the application of Open Network Provisions.

[11] CEPT/ECTRA Recommendation on a Set of Guidelines on Responsibilities for ensuring maintenance of Network Integrity (NI) in an interconnected environment, Rec(98)01, 12th of March 1998.

[12] CEPT/ECTRA Recommendation on the use of Special Network Access, Rec(99)01, 3rd of March 1999.

[13] Directive 97/66/EC of the European Parliament and Council on the processing of personal data and the protection of privacy in the telecommunications sector.

[14] ETSI ETS 300 090 (1992): "Integrated Services Digital Network (ISDN); Calling Line Identification Restriction (CLIR) supplementary service; Service description".

[15] ETSI ETS 300 335: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 1; Test specification".

[16] ITU-T Recommendation Q.1200: "General series Intelligent Network Recommendation structure".

3 Definitions and abbreviations

3.1 Definitions

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

calling line identity: number that uniquely identifies a subscriber line that is used for a call

circuit-related interface: signalling connection between a public telecommunications network operator and a service provider, with the extension of the call connection from the public telecommunications network to the service provider's equipment

end user: see "service user" definition

network-network interface: interface at a network node which is used to interconnect the node with another network node

network-provided calling line identity: that is provided by the originating public telecommunications network to a call setup request, if the calling party has not provided any calling line identity or the user-provided calling line identity has not passed a verification in the network [15]

non-call-related: call-unrelated

non-circuit-related interface: control connection between a public telecommunications network operator and a service provider, without the extension of the call connection from the public telecommunications network to the service provider's equipment

presentation-restricted calling line identity: calling line identity that is associated with a marking informing the terminating local exchange not to display this calling line identity to the called party [14]

public telecommunications network: telecommunications network which provides telecommunications services to the general public [1]

public telecommunications network operator: entity which is responsible for the development, provisioning and maintenance of telecommunications services to the general public and for operating the corresponding networks [1]

public telecommunications network originating: pTN to which either the originating line is directly connected or in which an incoming call initiates a service

public telecommunications network terminating: pTN to which either the terminating line is directly connected or in which the terminating line's user profile is stored

service: that which is offered by an administration or recognized private operating agency (i.e. a public or private service provider) to its customers in order to satisfy a telecommunication requirement [1]

service provider: entity which provides services to its service subscribers on a contractual basis and who is responsible for the services offered. The same organization may act as a public telecommunications network operator and a service provider [1]

service provider access: access facility that enables a service provider to access specific functionality of a public telecommunications network.

service provider access interface: interface between a public telecommunications network and a service provider's equipment for enabling the service provider to access specific functionality of a public telecommunications network

service provider access requirement: requirement for access by a service provider to specific functionality of a public telecommunications network

service provider originating: service provider that provides either services relating to the originating line (or to the originating profile), or services acting on the information coming from the originating or incoming call

service provider terminating: service provider that provides either services relating to the terminating line (or to the terminating profile), or services acting on the call-related information coming from the terminating party's line

service subscriber: entity that contracts for services offered by service providers [1]

service user: entity external to the network that uses the services offered by the PTNO or SP

significant market power network operator: see [9]

special network access: access at network termination points other than the more commonly provided network termination points, such as the conventional user-network interfaces. See Article 16 of [9]

user-network interface: interface between the terminal equipment and a network termination point at which the access protocols apply

user-provided calling line identity: network number that has been provided by the calling party [15]

user-provided, not screened calling line identity: network number that has been provided by the calling party and has been passed forward by the originating public telecommunications network without performing any screening function for verification purposes [15]

user-provided, verified and passed calling line identity: network number that has been provided by the calling party and has been successfully verified in the originating public telecommunications network [15]

3.2 Abbreviations

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

CAMEL	Customized Applications for Mobile Networks Enhanced Logic
CdPy	Called Party
CFU	Call Forwarding Unconditional
CgPy	Calling Party
CLI	Calling Line Identity
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CP	Control Plane
CPE	Customer Premises Equipment
CR	Circuit-Related
CS-n	Capability Set n

DSS1	Digital Signalling System 1
EC	European Community
IN	Intelligent Network
INAP	Intelligent Network Application Part
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
ITU-T	International Telecommunications Union - Telecommunication standardization sector
IVR	Interactive Voice Response
LI	Lawful Interception
MAP	Mobile Application Part
MCID	Malicious Call IDentification
MP	Management Plane
NCR	Non-Circuit-Related
NNI	Network-Network Interface
NRA	National Regulatory Authority
NTP	Network Termination Point
PSTN	Public Switched Telephone Network
PTN	Public Telecommunications Network
PTNO	Public Telecommunications Network Operator
PTNorig	originating Public Telecommunications Network
PTNterm	terminating Public Telecommunications Network
PTNtran	transit Public Telecommunications Network
SCP	Service Control Point
SMP	Significant Market Power
SNA	Special Network Access
SP	Service Provider
SPA	Service Provider Access
SPAI	Service Provider Access Interface
SPorig	Service Provider originating
SPterm	Service Provider terminating
SSP	Service Switching Point
TCP	Transmission Control Protocol
UNI	User-Network Interface

4 Introduction

4.1 Current situation

Different types of network control (or signalling) interfaces exist within a public telecommunications network (PTN), between PTNs and for those accessing the PTNs.

There are provisions in two of the open network provisions directives of the European Commission [9] and [10] that provide a regulatory framework for organizations delivering publicly available telecommunications services to request a non-discriminatory access to the networks of those public telecommunications network operator (PTNOs) which have been determined as having "significant market power" (SMP).

Therefore, in order to enable (SPs to deliver services by utilizing the network functionality of one or more PTNs, a specific SPAI may become necessary.

Although there is current work going on within the Internet Engineering Task Force and the Parlay Group that may be relevant; apart from enhancing the basic integrated services digital network (ISDN) access, i.e. DSS1, there are no standardized interfaces available between the SP and the PTNO domains to enable SPA requirements to be satisfied.

The present document defines the first set of service providers' access requirements. The existing network-to-network interfaces (NNI) and user-to-network interfaces (UNI) do not, without enhancement, have the necessary functionality to meet the SPA requirements. Moreover, the existing IN interfaces defined within the ETSI and ITU-T as part of INAP CS-1 were designed primarily for intra-network use with IN CS-2 offering an initial inter-network IN control relationship, neither were specifically designed to meet the requirements of an "open" access interface or to incorporate features that ensure network access integrity and security.

It is seen, therefore, as desirable to develop standardized interfaces to meet the SPA requirements that include features to ensure network integrity and security. There may also be a need to consider service feature interaction. These standardized interfaces are referred to, in the present document, as SPAI.

It will be seen that the SPA requirements fall into circuit-related (CR) and non-circuit-related (NCR) categories, hence development of the SPAI could use the existing CR and NCR interfaces as a basis, or alternatively, entirely new interfaces could be developed.

4.2 Regulatory aspects

Special network access (SNA) is a regulatory provision specified in Article 16 of [9]. The SNA concept has been introduced to enable those organizations providing telecommunications services to gain access to the public telecommunication networks of SMP organizations, at network termination points (NTPs) other than the more commonly provided NTPs such as the typical range of user-network interfaces for the PSTN and ISDN.

The SNA may be facilitated via technical interfaces between SP organizations requesting such access and those organizations which are obligated under the directives to respond to requests for its provision.

The Voice Telephony directive [9] requires that SMP organizations offering the SNA should follow the principle of non-discrimination. This means that SMP organizations shall provide SNA facilities to requesting organizations under the same conditions and the same quality that they provide for their own services or subsidiaries.

This implies that under the Voice Telephony directive [9] SPs could expect to receive network functions or capabilities on the same terms and conditions as what SMP organizations offer to their own service subsidiary. It will be a matter for national regulatory authorities (NRAs) to decide what capabilities can be reasonably made available via the SNA, should there be commercial disputes.

The specification of the SPA requirements and the resulting interfaces should be guided by the work done by the European Committee for Telecommunications Regulatory Affairs (ECTRA) and the European Telecommunications Platform (ETP) on both network integrity and the special network access as introduced in the relevant EC directives [12].

All the requirements that are related to the usage and delivery of the calling line identity (CLI) shall be in accordance with the legal and regulatory provisions in each country, as well as the general provision of the European directive of privacy and data protection [13].

The technical requirements of legal interception (see ES 201 158 in Annex A) and [13] will need to accord with the specific national regulations on security and interception that are in force in the respective countries.

SPs wishing to operate in one or more countries will need to comply with the specific regulatory requirements of the different NRAs. This may entail some kind of authorization or other rules which are applicable in various countries. Such rules may include the procedures by which the SPs are allocated numbers for their specific services. The requirements of national licensing or authorizations is however outside the scope of the present document.

4.3 Security aspects

End users, SPs and PTNOs have a range of different business objectives and requirements regarding the provision of telecommunication services over PTNs. A number of those objectives have been identified [3]. In order to meet them, security aspects need to be carefully considered in a new environment with a multitude of interconnections and access configurations for SPs.

From the viewpoint of the end users, the key requirements are:

- availability of the services;
- correct billing;
- fraud protection;
- confidentiality; and
- privacy.