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Network Aspects (NA) - Intelligent Network (IN) - Network operators' requirements for the delivery of service provider access

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Foreword

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

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1 Scope

The present document lists the first set of requirements that public network operators have for the delivery of service provider access. These requirements are intended to facilitate a non-discriminatory access to public telecommunication networks for service providers.

The present document does not fully take into account the service capability requirements from a service provider's perspective, these aspects are defined in EG 201 722 [7]. The two documents EG 201 722 [7] and the present document should not be considered separately for implementation.

The scope of the present document is to present generic functional requirements regarding the service provider access. The priority of each requirement is based on the need perceived from the public network operator´s viewpoint. Service interaction aspects are outside the scope of the present document. To fulfil these requirements, appropriate protocols and/or provisions may have to be developed taking into account network integrity, security, charging, and other considerations expressed in the present document.

Clause 4 contains introductory text describing the background and motivations of the requirements of service provider access. Clause 5 contains a description of the functional requirements of the service provider access interface. These requirements need to be considered additional to the requirements specified in EG 201 722 [7].

The present document relates to the role of the service provider and the role of the public telecommunications network operator, 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 network operator's internal service provisional body, shall also be offered on equal terms to external entities.

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2 References

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

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- 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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] CEPT/ECTRA Recommendation on network integrity, Rec(98)01, 12th May 1998.

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

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

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

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

[6] ETSI ES 201 158: "Telecommunications Security; Lawful Interception (LI); Requirements for network functions".

[7] ETSI EG 201 722: "Intelligent Network (IN); Service provider access requirements; Enhanced telephony services".

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[8] ETSI EG 201 781: "Intelligent Network (IN); Lawful interception".

3 Definitions and abbreviations

3.1 Definitions

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

firewall: means of preventing external parties from directly accessing internal network resources. All signalling to internal network resources are directed via an entity dedicated to that purpose.

mapping: systematic way of converting messages from one signalling system to messages of another signalling system.

public telecommunications network: telecommunications network which provides telecommunications services to the general public [4].

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 [4].

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.

screening: process involving intercepting signalling messages to check their contents before allowing them to continue, or rejecting them.

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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 [4].

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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 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 a service provider´s access to specific functionality of a public telecommunications network.

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 Directive 98/10/EC [2]).

3.2 Abbreviations

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

CdPy	Called Party
CgPy	Calling Party
CLI	Calling Line Identity
EC	European Community
ECTRA	European Committee for Telecommunications Regulatory Affairs
ETP	European Telecommunications Platform
ETSI	European Telecommunications Standards Institute

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ISDN	Integrated Services Digital Network
NRA	National Regulatory Authority
NTP	Network Terminating Point
PTN	Public Telecommunications Network
PTNO	Public Telecommunications Network Operator
PTNorig	originating Public Telecommunications Network
PTNterm	terminating Public Telecommunications Network
SP	Service Provider
SPorig	Service Provider originating
SPterm	Service Provider terminating
SPA	Service Provider Access
SPAR	Service Provider Access Requirements
UNI	User-Network Interface

4 Introduction

4.1 General

The aim of the present document is to define the requirements that need to be met when service providers wish to access functionality in the public telecommunication networks of PTNOs. Such requirements will generally apply to the interface between the PTNO and the SP. In EG 201 722 [7] the functional requirements which apply to this access interface from the perspective of service providers are specified.

The requirements in EG 201 722 [7] however do not adequately take into account the network integrity, charging or other aspects from a PTNO's perspective, that nevertheless needs to be clearly specified if the PTNO is to provide reliable and secure network access to the service provider. These technical conditions would in most cases be applicable to both the PTNO and the SP but there are clearly instances when the requirements may have to be given special and different treatment by the PTNO.

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It is therefore important to ensure that the functional specifications defined in EG 201 722 [7] fully respect the technical criterion applicable to integrity, charging, and other key aspects that are of vital importance to both PTNOs and SPs. The requirements defined in the present document are from a PTNO's perspective and should therefore be read in conjunction with EG 201 722 [7].

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4.2 Regulatory aspects

The present document outlines the current regulatory criterion which is applicable to service providers requesting "special network access" from the PTNO. These criteria primarily emanate from Article 16 of the Voice Telephony directive (see Directive 98/10/EC [2]) that places obligations on "significant market power" organizations to respond to "reasonable requests" for special network access.

Hence all NRAs in EU countries will be under an obligation to implement in national regulation the requirements of the EU directives and this means PTNOs nominated as having significant market power will need to comply with special network access requirements. It will be a matter for NRAs in each country to decide if they wish to go further and apply the EU requirements to "non-significant market power" organizations but there are clearly no obligations for member states to take these steps.

There are requirements in the directive to ensure that network integrity is fully respected and this means that both public telecommunication network operators and service providers will need to ensure that network integrity requirements are incorporated in their network facilities. The European Committee for Telecommunications Regulatory Affairs (ECTRA) recommendations on network integrity (see CEPT/ECTRA Recommendation (98)01 [1]) and the European Telecommunications Platform (ETP) guideline report on network integrity (see ETP guidline in Bibliography) outline broad regulatory and operational aspects of network integrity and are relevant to the present document.

Hence from the regulatory perspective PTNOs designated as operators having significant market power will be required to respond to "reasonable requests" for special network access. Those organizations designated, as having significant market power, shall in accordance with Article 16 of the Voice Telephony Directive adhere to the principle of non-discrimination (see Directives 98/10/EC [2] and 97/33/EC [3]). It will be a matter for both PTNO and SP to agree on what network services can be made available via special network access and whether such services are technically and economically feasible subject to regulatory oversight by the NRA.

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The technical requirements of legal interception will need to accord with the specific regulations on security and interception that are in force in the respective countries (see EG 201 781 [8] and ES 201 158 [6]).

PTNOs willing to operate in one or more countries have to comply with the specific regulatory requirements of the NRAs of those countries. PTNOs are obliged to support the numbers being allocated to SPs by the NRA responsible for the respective country for the provision of the specific services offered by the SPs in that country.

4.3 Network integrity aspects

Network integrity is a question of network management and the ability of the network to maintain certain characteristics with regard to performance and reliability.

Network integrity is a key issue when a network relationship is established between the PTN and the SP. The opening of the PTNO's networks to the SP involves the broadening of access to stored data/information. Data shall be adequately protected by use of passwords and partitioning, so that the integrity and privacy is not compromised.

Network integrity also involves ensuring the integrity of the network elements and providing an acceptable level of service. Vulnerabilities associated with system integrity may result in service denial or disruption, or the unauthorized modification of user or network information and network services.

The evolution of the PTNO's networks needed to support the enhanced services of the SPs creates the need for planning the growth of real time switch capacity in concert with the emergence of this new access service. In order to cope with this issue, PTNOs and SPs should negotiate traffic engineering aspects to ensure that adequate network capacity is available. If PTNOs and SPs do not adequately plan for increase capacity the public network will be vulnerable to disruption and denial of service problems.

The following aspects should be considered:

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- A gateway function between the PTN and the SP, specially the charging/billing messages and their parameters.
- The protection mechanism in order to ensure that the SPs do not affect in a negative way the services provided in the PTN.

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- The authentication/ciphering mechanisms to protect the PTN from the vulnerabilities due to the Service Provider access.

On the other hand, in order to maintain network integrity, the following requirements exist:

- Compatibility measures should ensure that networks and the SPs with different levels of performance work together correctly.
- Mechanisms to support conformance testing procedures should exist in order to verify PTN and SP interoperability.
- Service Provider access increases the potential for vulnerabilities associated with feature interaction problems in case there is no sufficient level of expertise to deal with this problem. Feature interaction could disrupt a needed service or be targeted for intentional abuse by computer intruders. Appropriate measures should be implemented to avoid this kind of risks.

The range of services offered by SPs is likely to lead to different interface types used for SPA. These different types of interfaces may require different sets of functionalities within the gateway at the network boundary.

4.4 Security aspects

Security aspects of the SPA are briefly described in EG 201 722 [7].