NATIONAL SIGNALLING PLAN

I - INTRODUCTION

I. 1.
Objetives

The objective of this National Signalling Plan (NSP) is to be the basis for the adequate use and management of national resources related to signalling among public telecommunications networks and to ensure their adequate interconnection, in the best interest of telecommunications services users and providers. The main criteria for this NSP are the efficient and non-discriminatory distribution of available resources.

I.2. NSP background and needs

Quick technological changes, together with the introduction of new services require the update of the general reference framework which guarantees telecommunications carriers interconnection of their networks. Towards that end, the Secretariat for Information and Communication Technologies (SETIC) and the National Communication Agency (ENACOM) have developed the present NSP.

I.3. Current situation

In-use Common Channel Signalling (CCS#7) is based on the ITU-T standards known as MTP and ISUP. For National Signalling Point Codes (NSPC) a 14-bit structure is used, and some of them are already being used by telecommunications carriers. For International Signalling Point Codes, the ITU has allocated a one (1) 8-code block to Argentina.

Over the last years and due to the advent of new technologies based on the intensive use of the Internet and its associated protocols, the telecommunication industry has developed as a signalling protocol the Session Initiation Protocol (SIP), which has been widely disseminated among carriers in the sector.

The NSP approved by Resolution N° 47 SC/97, ratified by Decree N° 92/97 and incorporated thereto as Annex V, suggested for the interconnection of telecommunication carriers protocol R2N (digital version) until 31 December 1998, regardless of the fact that, for the interconnection links that were operating at the time, it suggested that they should continue to use that same signalling until 31 December 2001. Despite these suggestions, there are still carriers that continue to use R2N to this date (digital version).

I.4. Considerations and Principles

The National Signalling Plan (NSP):

1. Must offer an adequate capacity to unambiguously identify all Signalling Points, Signalling Transfer Points and Service Control Points in the national territory of the networks requiring these codes and to establish, modify and interrupt the multimedia sessions that so require.

2. Must offer the flexibility and capacity necessary to satisfy future growth requirements.

3. Must offer stability from the point of view of telecommunications carriers and long periods without significant changes.

4. In an environment of growing competition, must allow the allocation of codes, as well as the use of new signalling protocols, without impairing the NSP as a whole.

5. Must be compatible with the related international Recommendations.

6. Must allow a fair and efficient management of codes.

The NSP and SPC shall be considered a national resource, and therefore their distribution does not entail their ownership.

II. ABBREVIATIONS AND BASIC DEFINITIONS

Adaptive Multirate Codec (AMR)

Enforcement Authority: NATIONAL COMMUNICATION AGENCY.

Regulatory Authority: SECRETARIAT FOR INFORMATION AND COMMUNICATION TECHNOLOGIES.

CODEC: Process through which information is compressed/decompressed; it can be executed through software, hardware or a combination of both.

Signalling Point Code (SPC): Code which unambiguously identifies a Signalling Point in a common channel signalling network.

National Signalling Point Code (NSPC): Code which unambiguously identifies a Signalling Point in a national common channel signalling network.

International Signalling Point Code (ISPC): Code which unambiguously identifies a Signalling Point in an international common channel signalling network.

Circuit switching (CS)

Bearer Independent Call Control (BICC)

User Equipment (UE)

IP Multimedia Core Network (IM CN)

Internet Protocol (IP)

Internet Engineering Task Force (IETF)

IP Multimedia Subsystem (IMS)

Interworking Unit (IWU)

Number of A-party (ANI): Number which identifies the origin of a call.

Number of B-party: Number which identifies the destination of a call.

International Number: The International Number is made up of the Country Code followed by the National Number.

National number: Digit combination which identifies a customer within a particular country.

Session Initiation Protocol (SIP): Internet Protocol that uses the resources of said network to establish and control multimedia sessions based on IETF RFC 3261 and the additional RFCs.

Signalling Protocol: Combination of message exchange rules and mechanisms in the signalling network, which are necessary to control the functions within a telecommunications network and among several networks.

Signalling Point (SP): Point in a signalling network which originates and receives signalling messages, or transfers signalling messages from link to link, or does both simultaneously.

Service Control Point (SCP): Function or entity in the telecommunications network, which has access to data and logic in order to control the processing of a call.

Signalling Transfer Point (STP): Signalling point with the function of transferring signalling messages from one signalling link to another, considered exclusively from the transferring point of view.

Integrated Services Digital Network (ISDN)

ISDN User Part (ISDN-UP)

Public Land Mobile Network (PLMN)

Core Network (CN)

Request for Comments (RFC)

Public Switched Telephone Network (PSTN)

Signalling: information exchange mechanism between telecommunication network systems and equipment, necessary to set up, maintain, control, rate and bill communications between two or more customers.

Common Channel Signalling System #7 (CCSS#7)

Stream Control Transmission Protocol (SCTP)

Technical Specification (TS)

Transmission Control Protocol (TCP)

Third Generation Partnership Project (3GPP)

International Telecommunication Union (ITU)

User Datagram Protocol (UDP)

III. SIGNALLING PROTOCOLS

Act N° 27.078 establishes an open architecture in telecommunications carriers' networks, in order to guarantee their interconnection and interoperability. In the cases in which the Enforcement Authority is required to arbitrate upon the lack of interconnection agreements, its resolutions shall be based on the established protocols and architecture.

The signalling protocols established for interconnection between telecommunication carriers are the Session Initiation Protocol (SIP) and ISUP- CCS#7.

Therefore, the networks operating under signalling protocol for interconnection between telecommunication carriers ISUP-CCS#7 will be able to continue doing so, provided that they ensure the interoperability of the messages in that SIP protocol, if necessary, under their exclusive responsibility.

The remaining protocols whose purpose is to send and receive signalling messages between networks of different carriers shall expire within two (2) years as from the publication date of the standard approved by this NSP. Consequently, the carriers currently using these protocols shall use signalling in any of the protocols established herein, either by changing the equipment or translating the messages into SIP or ISUP- CCS#7 messages.

Those protocols used with signalling purposes for internal control of the networks, such as H.248 for example, fall outside the scope of this NSP and therefore may be freely used without any kind of restrictions.

The Regulatory Authority may establish in the future other forms and signalling protocols, making public this decision two (2) years in advance of its entry into force.

IV. SIGNALLING POINT CODES FOR CIRCUIT SWITCHING NETWORKS.

IV.1. Introduction

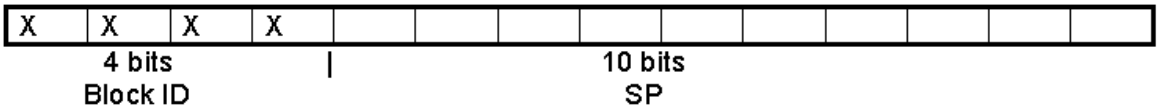
The global signalling network is structured in two independent functional levels: the international and national levels. Such structure allows a clear division of responsibilities for signalling network management, and makes it possible for national and international signalling point code distribution plans to be independent from each other.

IV.2. Length and Structure of National Signalling Point Codes (NSPC)

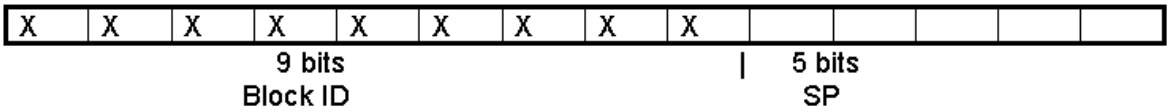
National signalling point codes (NSPC) will use a 14-bit-long structure, based on Recommendation ITU-T-REC-Q.704. In the long run, and if there were a higher demand for new services and growth of circuit-switched based telecommunication networks, there could be a need to review the NSPC format, in which case the Enforcement Authority shall establish a migration plan contemplating reasonable deadlines.

Three 14-bit structures shall be maintained:

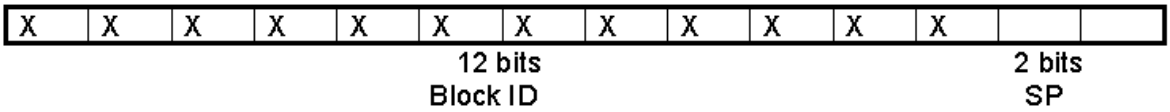
a) A structure with 4 bits for block identification, with the capacity to internally allocate up to 1024 CPSN each.



b) A structure with 9 bits for block identification, with 32 internally assignable codes.



c) A structure with 12 bits for block identification, with 4 internally assignable codes.



This definition of structures in three sizes allows great management flexibility and the efficient use of signalling point codes, since any carrier may, if it wishes, request additional blocks.

IV.3. International Signalling Point Codes (ISPC)

The format of international signalling point codes (CPSI) and the guidelines for their distribution are described in ITU-T Q.708 Recommendation.

The ISPC is 14-bits long and is made up of a Signalling Area/Network Code (SANC), and the ID of the signalling point proper (3 bits). World management of SANC is the responsibility of the ITU Telecommunication Standardization Bureau (TSB).

At the same time, the SANC is made up of a 3-bit geographic area/region and the 8-bit area/network identification code.

To date, Argentina has been allocated the SANC 7-044, which corresponds to 8 international signalling point codes (ISPC).

V. MANAGEMENT

V.1. Principles

The Enforcement Authority is responsible for managing the National Signalling Plan.

The Enforcement Authority shall have the following functions and responsibilities:

1. Interpreting this NSP and solving all related disputes.

2. Allocating NSPC and notifying the carriers.

3. Representing Argentina before the ITU and requesting SANC for ISPC.

4. Allocating ISPC and notifying the carriers.

5. Supervising and controlling NSP resources.

6. Others related to the correct managing and implementation of the NSP.

The Enforcement Authority will adopt a procedure through which it can control and manage the status of this NSP in the country and address carriers' requests in a timely fashion.

The NSP code groups are:

a) NSPC.

b) NSPC allocated to Argentina.

Each group has a different management procedure.

The Enforcement Authority shall keep an information system of the NSP containing detailed information about the NSPC and ISPC (allocated, reserved and vacant) and the carriers to whom they have been allocated. To such effects, the telecommunication carriers shall inform the Enforcement Authority about the coming into operation, modification or vacating of the SPCs within thirty (30) days of performing said action. Failure to comply with the obligation of informing the Enforcement Authority shall be considered a serious non compliance.

V.2. Procedure for allocating national signalling point codes (NSPC)

Every telecommunications carrier with common channel signalling networks within the national territory may request NSPC.

Every telecommunications carrier requiring NSPC shall submit an application to the Enforcement Authority pursuant to the procedure established by such Authority.

Once an NSPC block is allocated to a carrier, it shall manage its codes internally and may request additional blocks.

For block allocation, the following criteria will be taken into account:

a) NSPC blocks of the following types will be allocated:

IV.2.a) To carriers with more than 500 operating centres.

IV.2.b) To carriers that require between 5 and 32 NSPC in a (3) three-year period.

IV.2.c) To carriers that require up to 4 NSPC in a (3) three-year period

b) In the case that 90 % of all NSPC is allocated, only the IV.2.c-type block allocation stage will be started.

c) When assignable blocks are used, the contingency stage starts, in which individual NSPC are allocated and there may be a revocation of NSPC allocations not in use, or not used for 2 months after the allocation.

d) The Enforcement Authority may allocate individual NSPC codes to those carriers requiring only one.

The Enforcement Authority must verify the correct and timely use of allocated NSPC according to the type of service offered and the amount of equipment implemented.

In those cases where the coming into operation, modification or vacating of an NSPC affects or involves another carrier, the carrier receiving the resource shall notify the Enforcement Authority and the affected carriers (two) 2 months in advance, in order to give them time to register the NSPC status in the networks impacted by the changes.

Moreover, the maximum time elapsed between the allocation of a block and the coming into operation of at least one of its NSPC must correspond to what the carrier expressed in the application, but must never exceed the term of one (1) year.

V.3 Procedure for allocating international signalling point codes (ISPC)

The NSP Enforcement Authority shall request the allocation of more SANC to Argentina before the relevant ITU agencies dealing with the world management of this resource.

Service providers requiring these codes must submit their requirements to the Enforcement Authority, supporting their request with their respective expansion commitments and any other relevant information requested to the Enforcement Authority by the ITU.

The allocation of international signalling point codes will be carried out individually, as decided by the Enforcement Authority.

The maximum time elapsed between the allocation of an ISPC and its coming into operation must not exceed the period of (2) years.

V.4 Revocation of SPC

Telecommunications carriers who stop using one or more allocated SPC must notify the Enforcement Authority accordingly.

The Enforcement Authority may revoke the allocation of blocks or SPC not in use, which will be available for allocation to other carriers.

VI. EXCHANGE OF INFORMATION.

In addition to the information necessary to set up and release a call, the minimum information to be exchanged in real time in network interconnection signalling shall be the following:

a) Number of A-party (ANI) in National Number format

b) The category of "A-party", including at least: operator, payphone or regular subscriber.

c) Number of B-party in National Number or International Number format, as appropriate.

d) The category of "B-party", including at least: free subscriber, busy subscriber and answering (connection).

The information for call establishment in the ISUP-CCS#7 shall be sent in a block (all the information in the initial address message).

VII. SIGNALLING FOR PACKET SWITCHING NETWORKS

VII.1 Introduction.

The SIP protocol was originally developed by the Multiparty Multimedia Session Control Working Group of the IETF. Since its first version in 1997 until it reached the Standard status proposed in 1999, different alternatives were analyzed and modified. Finally RFC 2543, that detailed the original version, was replaced by RFC 3261 containing the specifications for the SIP protocol, from which other RFC have been developed to complement the version described therein.

The SIP protocol may be used over transport protocols such as TCP, UDP, SCTP falling outside the scope of this NSP the definition or recommendation of one instead another. SIP is constituted as a signalling protocol for the development, modification and termination of multimedia sessions, to determine and request the presence of users in the network, and to send and receive instant

messages.

VII.2 Interconnection with other Networks.

In order to achieve coexistence and transfer of signalling messages between networks that support the protocols planned in this NSP, the latest version of the International Telecommunication Union Q series Recommendation ITU-T Q 1912.5 is adopted where the functions that IWUs shall support for the correct interrelation between protocols are described.

The importance of the conversion among voice scramblers should not be overlooked since the ones mostly used in RTPCs present incompatibilities with voice over Internet transmissions, given the fact that they were not designed for transmission over a packet network. The proper CODEC conversion such as G.711, G.721, G.723, G.729A or AMR to CODECs for use in Internet networks like iLBC or Opus shall be resolved by will and agreement between the parties and reflected in the respective interconnection agreements. The Enforcement Authority shall take part in case agreement is not reached, therefore precluding network interoperability.

It should also be taken into account that IMCN subsystems shall interact with the legacy CS networks based on BICC and ISUP, for example PLMN, ISDN, CS PLMN, in order to provide the capacity to support basic voice calls between UE located at Subsystem IM CN and the user equipment located at a CS network. For the different functions required by IMCN and CS networks, specifications TS 24.229 of 3GPP for SIP and recommendations series ITU-T Q761 to Q764 for ISUP-CCS#7 are adopted.

The use of the encapsulation method for ISUP messages received in SIP, SIP-I messages is not part of this NSP, since the future obsolescence of CCS#7 will also lead to signalling obsolescence between networks using this strategy for the correct transfer of messages between them.

Finally, it is always worthwhile to make clear that the use of the SIP protocol exempts the need for interconnection in a determined physical point, enabling virtual interconnection between different networks simply through their IP addresses.

VII.3 Mobile Networks.

The 3GPP adopted the SIP protocol as a signalling protocol in IMS. From then on, an important number of documents have been developed to bring support to the different functionalities demanded by the mobile communication world. Therefore, RFCs 3255, 3266, 3267, 3361, 5632 and 5944 should be taken into account at the time of implementing SIP in mobile networks.

VII.4 Instant Messaging.

As from 2001, the IETF created a working group to develop specifications that allow the exchange of instant messages using the SIP protocol. This has given rise to a new series of RFCs in order to achieve such goal. This NSP adopts RFCs 3428, 3994, 5365, 4975, 4976, 3862 and 5438 as recommendable to be taken into account at the time of implementing this functionality.

VIII. EVOLUTION

The SIP is a constantly evolving protocol that allows the incorporation of functionalities under development. Based on the above, this NSP recommends the adoption of the future developments that the IETF or ITU working groups produce in order to extend the range of services that the SIP can support.