ATIS-0500018

ATIS Standard on -

P-ANI ALLOCATION TABLES FOR ESQKS, ESRKS, AND ESRDS

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ATIS-0500018, *P-ANSI Allocation Tables for ESQKs, ESRKs, and ESRDs*

Is an ATIS Standard developed by the **Emergency Call & Data Routing (ECDR)** Subcommittee under the **ATIS Emergency Services Interconnection Forum (ESIF)**.

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P-ANI Allocation Tables for ESQKs, ESRKs, and ESRDs

Alliance for Telecommunications Industry Solutions

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Abstract

This document contains ESQK, ESRK, and ESRD allocation tables and capacities. The content of this standard is intended to assist Wireless Service Providers (WSPs) and Mobile Positioning Centers (MPCs) in improving the efficacy of the p-ANI number use and administration, and complement number preservation and utilization of limited p-ANI number resources. The allocation model is intended to be easily utilized by Eligible Users and entities assigning p-ANIs.

Foreword

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between carriers, customers, and manufacturers. The Emergency Services Interconnection Forum (ESIF) provides a forum to facilitate the identification and resolution of technical and/or operational issues related to the interconnection of wireline, wireless, cable, satellites, Internet and emergency services networks.

Suggestions for improvement of this standard are welcome. Send suggestions to the Alliance for Telecommunications Industry Solutions, ESIF Secretariat, 1200 G Street, NW, Suite 500, Washington DC 20005.

ESIF was responsible for the development of this standard.

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Table of Contents

Table of Tables

ATIS Standard on –

P-ANI Allocation Tables for ESQKs, ESRKs, and ESRDs

1 Scope, Purpose, & Application

1.1 Scope

The North American Numbering Council's (NANC) P-ANI Issues Management Group (IMG) has requested that ESIF create a formula to serve as a guideline for the P-ANI Administrator in evaluating the appropriateness of the quantity of p-ANIs per PSAP requested by an Eligible User.

1.2 Purpose

The algorithms and tools/aids developed and illustrated in this standard will assist Wireless Service Providers (WSPs) and Mobile Positioning Centers (MPCs) to improve the efficacy of the p-ANI number use and administration, and complement number preservation and utilization of limited p-ANI number resources.

There are three types of p-ANI in general use: Emergency Service Query Keys (ESQKs), Emergency Service Response Keys (ESRKs), and Emergency Service Routing Digits (ESRDs). This document will provide separate allocation guidelines for each type.

ESQKs are used for VoIP. Most ESQKs will be assigned to and managed by VPCs. According to NENA standards, VPCs will use the ESQKs to route calls for multiple VSPs. Typically, a "pool" of multiple ESQKs will be designated for a specific PSAP or Emergency Services Zone within a PSAP.

ESRKs are unique to wireless carriers. Unlike ESQKs, ESRKs are not assigned to MPCs. ESRKs are assigned to individual WSPs; each WSP has its own pool of ESRKs per PSAP. ESRKs are not shared among multiple WSPs. The WSPs acquire ESRKs and then delegate management responsibility to the MPC. Functionally, ESRKs and ESQKs operate the same way. Like ESQKs, ESRKs are generally assigned in pools, except that with ESRKs, each WSP has a pool of their own ESRKs.

ESRDs are also unique to wireless carriers, but they are employed in a different manner than ESRKs. An ESRD identifies a specific cell sector for a designated PSAP.

P-ANIs may also be used as Reference Identifiers for SMS to 9-1-1 when a PSAP chooses the TTY interwork function for delivery of SMS to 9-1-1. A Text Control Center (TCC) may use either ESQKs or ESRKs as Reference Identifiers. Either application of p-ANIs is acceptable.

This allocation model would provide general industry guidance with regards to the quantity of ESQKs, ESRKs, and ESRDs assigned to an Eligible User by any entity (carrier or p-ANI administrator) that is allocating these non-dialable resources. The intent is to provide a quantity that is a guideline – not an absolute maximum. Eligible Users who request quantities of ESQKs in excess of the guideline quantity would be expected to provide additional documentation that could include more detailed statistical-based models and real-world experience on ESQK usage within certain geographic areas, to support their request for such additional numbers. It should be noted that technology convergence is already blurring the lines between the three types of p-ANIs. For example, some wireless calls that originate on femtocells may be routed via the IP network of a VPC using ESQKs. Applications such as this may constitute justification for requesting more or less p-ANIs than the standard formulas suggest.

1.3 Application

This standard focuses on the development of a pseudo Automatic Number Identification (p-ANI) allocation model to be used by Wireless Carriers, VoIP Service Providers (VSPs) and VoIP Positioning Centers (VPCs) to determine the quantity of p-ANIs to be assigned to an Eligible User for use as ESQKs, ESRKs, or ESRDs. The standard helps to ensure the efficient and effective use of p-ANI resources for ESRK purposes and strives to define methods and algorithms for use by industry to follow that will result in assignment/allocation in a manner that will promote conservation of these vital numbering resources, while meeting provisioning needs.

2 Acronyms & Abbreviations

ALI	Automatic Location Identification
ATIS	Alliance for Telecommunications Industry Solutions
ECDR	ESIF Emergency Call and Data Routing Subcommittee
ESIF	Emergency Services Interconnection Forum
ESN	Emergency Services Network
ESQK	Emergency Service Query Keys
ESRD	Emergency Services Routing Digits
ESRK	Emergency Services Routing Key
ESZ	Emergency Services Zone
GMLC	Gateway Mobile Location Center
HCAS	Hybrid Call Associated Signaling
MPC	Mobile Positioning Center
MSC	Mobile Switching Center
NCAS	Non-Call Associated Signaling
p-ANI	pseudo Automatic Number Identification
PSAP	Public Safety Answering Point
RNA	Routing Number Authority
TCC	Text Control Center
VPC	VoIP Positioning Center
VSP	VoIP Service Provider
WSP	Wireless Service Provider

3 Allocation of P-ANI Resources

Multiple p-ANI allocation models based on a variety of network and operational factors were evaluated, but those models did not openly appear to add significant value to the tables proposed herein. However, those discussions were helpful in identifying some exceptions that an Eligible User may find useful when justifying why additional p-ANI number resources (beyond those defined in the table) might become necessary.

Although not a comprehensive list, reasonable exceptions might include:

- The eligible user may need to request a sufficient numbers of p-ANIs to enable for a one-for-one replacement of dialable numbers currently used as p-ANIs when migrating to non-dialable p-ANI number resources administered by the RNA.
- Where a PSAP and/or other E9-1-1 governing authority requires the use of a “guard timer” in excess of 10 minutes and the commercial solution is capable of employing guard timing, the number of requested p-ANIs will be substantially greater than shown in the tables. A “guard timer” is a technology device that prohibits the reuse of p-ANI sooner than the timer expiration period.

- Some ALI systems may cache the p-ANI and related MPC/GMLC responses for a specified length of time, which will result in the need for p-ANI quantities in excess of those shown in the tables above.

4 ESRK, ESRD, & ESQK Allocation Tables for Routing Wireless E9-1-1 Calls

The following tables should serve as an aid in determining a reasonable quantity of ESRKs, ESRDs, and ESQKs that might be required by an Eligible User in order to provide wireless E9-1-1 service. The tables below are also based on the following assumptions:

1) ALI system does not cache ESQK/ESRK and related VPC/MPC response. If the ALI does, additional ESQKs/ESRKs may be required.
2) The guard timer value is ten (10) minutes.
3) Call termination indication is not universally available. Where it is available, this may be the basis for calculating the requested number of ESQKs/ESRKs.

Table 4. 1 - ESRK Allocation Table

Voice Path Quantity[1]	Reasonable Number of ESRKs per PSAP
1 – 4	5
5 – 9	10
10 -14	15
Etc.	

Table 4. 2 - ESRD Allocation Table

Voice Path Quantity[1]	Reasonable Number of ESRDs
N/A	1 per cell sector

Numerous variables were investigated that might affect the number of ESQKs required per PSAP per Eligible User. Because the purpose of this formula is to help guide in determining reasonableness and not to establish a definitive quantity, the simple table below is provided for guidance:

[1] Voice Path Quantity is defined as the number of voice paths between a wireless carrier's Mobile Switching Center (MSC) and the selective router for a given PSAP, or the number of voice paths between the selective router and the PSAP used for wireless 9-1-1 call termination. The lesser of the above should be used as the basis for determining ESRK allocation.

Table 4. 3 - ESQK Allocation Table

Voice Path Quantity[2]	Reasonable Number of ESQKs per PSAP
1 - 4	5
5 - 9	10
10 - 14	15
Etc.	

Multiple allocation models were developed based upon a variety of network and operational factors. Those models do not appear to add significant value to the table above but they do highlight some potential exceptions that an Eligible User may cite for requesting a different quantity of p-ANI. These exceptions include, but are not limited to:

1) For PSAPs requiring land-line ESN equivalence, the number of p-ANI assigned should not be less than two (2) per ESN.
2) If the required call guard timer for a PSAP is greater than ten (10) minutes, the number of required ESQKs may be higher.
3) The technologies employed by various MPCs/VPCs to achieve system redundancy can vary. Some MPCs/VPCs may be unable to duplicate the same p-ANI in both redundant nodes, thus requiring twice the recommended quantities of ESRKs or ESQKs per PSAP.

[2] Voice Path Quantity is defined as the number of voice paths between a wireless carrier's Mobile Switching Center (MSC) and the selective router for a given PSAP, or the number of voice paths between the selective router and the PSAP used for wireless 9-1-1 call termination. The lesser of the above should be used as the basis for determining ESQK allocation.