Preparing for Next Generation 911

Defining the Next Generation 911 Vision and Actionable Steps toward Becoming Next Generation-Ready

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Table of Contents

1 Executive Summary

The Next Generation vision is being developed in response to the E911 needs of emerging technologies. It is vital that all participants in the 911 community, from telecommunications service providers to public safety entities, understand the intent of Next Generation 911 and prepare themselves for the inevitable. As several organizations, including the FCC and the National Emergency Number Association (NENA), iron out the details, a clear picture has emerged of the overall intent and high-level design of Next Generation 911, as defined here. Understanding the direction and implementing its necessary steps will give service providers, public safety entities, and enterprises a leading edge.

"Today's 911 system is built on an infrastructure of analog technology that does not support many of the features that most Americans expect are part of an emergency response…a call can be dropped or misdirected, sometimes with tragic consequences."

-CRS Report for Congress, Emergency Communications: The Future of 911,

November 21, 2008

2 Why Next Generation 911?

First, it is important to define enhanced 911 (E911). E911 is:

- The ability to validate and register a person's address in the 911 database upon turn-up of their voice service
- The ability to correctly route an emergency call to the appropriate public safety answering point (PSAP)
- The ability to provide the location information associated with the telephone number calling 911

In general, the public takes this ability for granted and assumes that when '9-1-1' is dialed, whether from a wireline, VoIP, or wireless phone, the location information is transmitted to the correct PSAP. However, due to an aging 911 infrastructure designed in the 1970s for wireline, E911 coverage is inadequate for many of today's commonly used communication technologies.

As a result, incumbent 911 providers are scrambling to come up with solutions on the fly, resulting in several non-integrated, non-standard networks for VoIP and wireless, and still no solution for other existing technologies like text, video, and telematics (like Onstar).

According to the November 21, 2008 CRS Report for Congress - Emergency Communications: The Future of 911, "Today's 911 system is built on an infrastructure of analog technology that does not support many of the features that most Americans expect are part of an emergency response. Efforts to splice newer, digital technologies onto this aging infrastructure have created points of failure where a call can be dropped or misdirected, sometimes with tragic consequences."

The safety repercussions created by the limited infrastructure have forced the 911 community to take a look at how to transition 911 systems to accommodate the expectations of the general public as well as the emerging technologies of today and the future. The result is Next Generation 911.

3 The Objectives of Next Generation 911

The goal of NG 911 is to provide "EMERGENCY HELP, anytime, anywhere, any device™."

-National Emergency Number Association (NENA)

Next Generation 911 is designed to meet the following objectives:

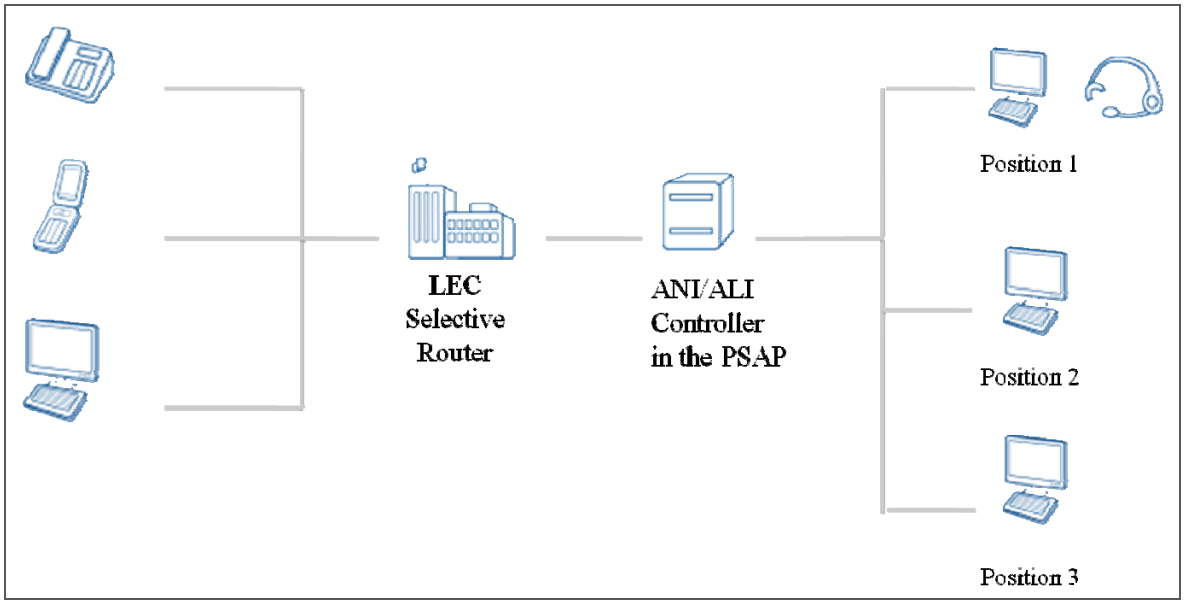
- E911 calls from any communications device
- A flexible, open, non-proprietary and secure architecture
- Standards and interoperability in the US and internationally
- Operating and maintenance cost savings, reduced capital expenditures
- Additional information to PSAPs related to the location, such as floor plans, or caller, such as medical records, or emergency contact information
- Geographic independent call access, transfer, and back-up between PSAPs and other emergency organizations
- Routing decisions made at the time of the call based on most up-to-date location information
- Meet NENA i2 and i3 standards
    - i2 – an interim solution leveraging existing 911 infrastructure
    - i3 – a long-term solution based on full IP network connectivity

These objectives combine to ensure the ultimate goal of Next Generation 911: To improve the effectiveness of the nation's emergency communications system and enhance public safety.

4 The Design of Next Generation 911

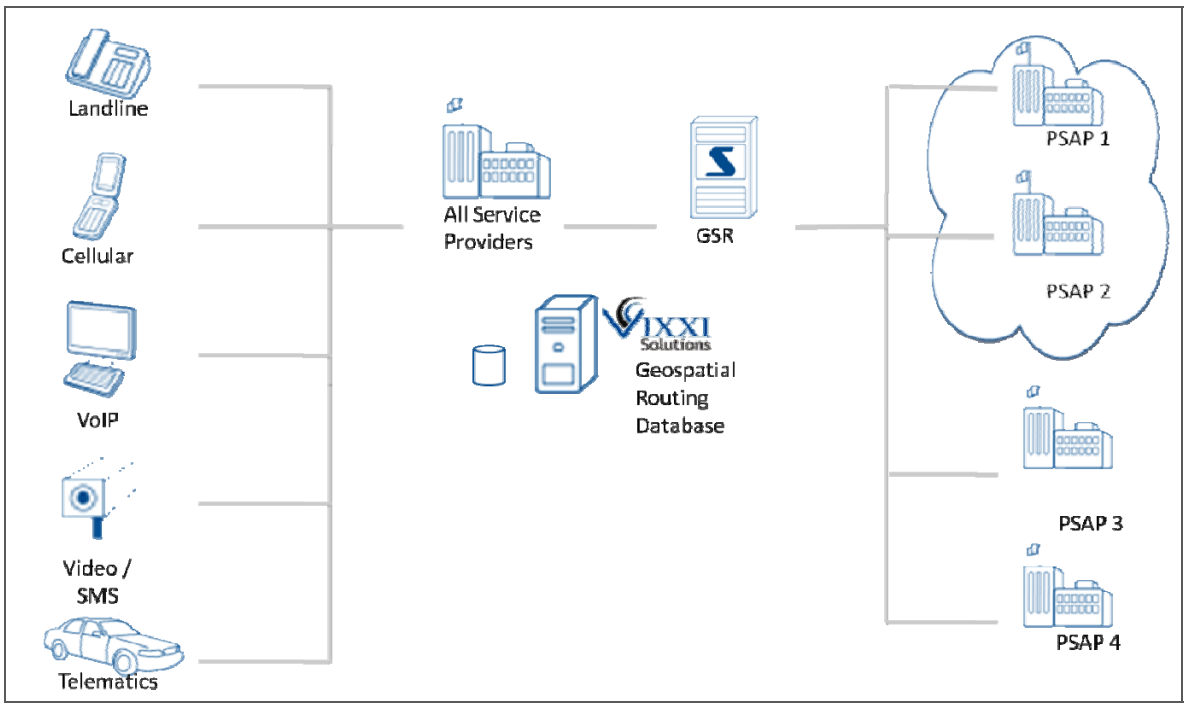
Legacy 911 systems use static circuit-switched routing and fixed physical trunks to transmit calls. Call routing is based on manually administered translation tables that employ a fixed one-to-one caller location to PSAP relationship. Limited in the types of communications technologies they can support, individual networks are inflexible, geographically dependant, and difficult to integrate with other 911 systems.

Figure 4.1: Legacy 911 Network Diagram



In contrast, Next Generation design uses IP technology to achieve the objectives of flexibility, geographic independence, and interoperability. Routing decisions are made dynamically at the time of the call based on automatically updated location information. Supporting all current and emerging technologies, NG design facilitates the easy transfer and back-up of calls between PSAPs.

Figure 4.2: Next Generation 911 Network Diagram



5 Actionable Steps toward Next Generation 911

Service providers, PSAPs, and enterprises can rest easier knowing they are ready for the inevitable. The first step is understanding Next Generation 911. The next step is selecting a 911 provider that delivers it. VIXXI Solutions, a nationwide 911 provider headquartered in Greenwood Village, CO, was founded in response to the E911 needs of emerging technologies per Next Generation objectives.

"Our network was purpose-built to the Next Generation vision. Not many people are aware that the Next Generation technology of 'tomorrow' is actually available today," says Christopher Camut, President and CEO of VIXXI.

Camut advises that it's important to challenge your potential provider with detailed questions that determine their viability for supporting Next Generation objectives. "Make sure your provider is going to prepare you for Next Generation so you are not stuck at the last minute doing a costly forklift upgrade to your infrastructure."

Here is a comprehensive list of questions to ask your potential 911 services provider to ensure they are truly Next Generation ready:

- Can you route E911 calls from any device on a single network?
- Can you deliver location information from any device?
- What communication types are you able to support (i.e. text, video, telematics)?
- Can you make dynamic routing decisions at the time of the call, based on the most up-to-date, automated PSAP boundary and caller location information updates?
- Can you provide E911 to any PSAP, if the PSAP is E911 capable?
- How does your network help me reduce my capital expenditures and direct and indirect costs?
- Is your network 100% IP-based?
- Can you provide additional information with a 911 call (i.e. medical records, emergency contact information, etc)?

Additional questions to ensure satisfaction with your 911 provider include:

- Can you customize your solution to meet my needs (unbundled components of 911 versus the end-to-end solution)?
- How easy is your solution to implement? How long will it take?
- How quickly can you verify subscriber location information upon turn-up?
- What are your coverage and connectivity options?
- Describe your customer care support process

By taking proactive steps to become familiar with Next Generation 911 and using that intelligence to select a competent NG 911 provider, service providers, PSAPs, and enterprises can have the cost saving benefits of Next

Generation 911, the peace of mind associated with being prepared, and the easy conscience of knowing that they are active participants in promoting the safety of the general public.