

Texas VoIP Deployment Report

**Prepared By:
Commission on State Emergency Communications
333 Guadalupe Street
Suite 2-212
Austin, TX 78701-3942
512-305-6911**

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I. Executive Summary

The VoIP Deployment Report is provided by the Commission on State Emergency Communications (CSEC) to describe the status of efforts to provide Enhanced 9-1-1 (E911) service to customers whose telecommunications service relies upon Voice over Internet Protocol (VoIP).

The following is a summary of accomplishments, current status and information contained in the report:

- CSEC established the Texas VoIP/911 Working group to expedite the deployment of VoIP E911 service in Texas.
- The Texas VoIP/911 Working Group developed standard procedures and service agreements for implementing Fixed and Nomadic VoIP E911.
- Migratory technical solutions are being developed by industry, the 9-1-1 community, and the National Emergency Number Association (NENA) for integrating Nomadic VoIP with existing 911 networks. Currently only the Pre-i2 solution can be used today due to technical limitations of existing 911 networks.
- Deployment activity to date has been successful. Texas 9-1-1 Entities have deployed VoIP E911 service in the majority of the state's 544 public safety answering points (PSAPs). Within the CSEC program area, over 300 of the 347 PSAPs have deployed VoIP E911.
- CSEC's model contracts have been finalized and are in use for Fixed and Nomadic VoIP services. CSEC staff sent a letter of inquiry to VoIP Service Providers (VSPs) that possibly provide service in Texas. Few responses to the letter have been received, and CSEC staff has begun contacting these service providers directly.
- CSEC Rule 255.4, *Definition of a Local Exchange Access Line or an Equivalent Local Exchange Access Line*, was amended in February 2005 to include the facilities relied on by VSPs between the end user customer premises and the service provider's network to provide the 9-1-1 access, and to make clear that such facilities are subject to the wireline emergency service fee.
- Statistical reports provided by the Texas Comptroller of Public Accounts' (Comptroller) reflect that some Fixed and Nomadic VSPs have begun to remit the wireline emergency service fee.

II. Purpose

This report is intended to describe the status of efforts to provide Enhanced 9-1-1 service to customers with Interconnected VoIP Service in Texas.

III. Background

Although the term VoIP telephony is used broadly to describe any number of services that transmit voice communications using internet protocols, there are two current distinctions as to the 9-1-1 service employed to support emergency calling:

1. Fixed VoIP - If the calling device and VoIP service are designed and intended to remain at a single, fixed location (e.g., a customer's residence), the solution is fairly straight forward and simple. In this case, the call path employs internet protocol technology instead of conventional circuit switched telephone lines. Since the device and service remain in a fixed location, Automatic Location Identification (ALI) information associated with the device can be stored in a fixed record in an ALI database. The same technology and processes that are used in conventional wireline E9-1-1 calling are used to enter and maintain address and location data in the ALI database. A VoIP 9-1-1 call received by a PSAP is indistinguishable from a traditional wireline call. This approach is typically employed by many of the cable companies offering VoIP telephony.
2. Nomadic VoIP - If the calling device and VoIP service can reasonably be moved and accessed from one location to another, it is considered to be nomadic. A 9-1-1 call must be supported by a dynamically generated and populated record in the ALI database that provides the necessary information to the PSAP receiving the call. The technologies and processes to support this convention at the same service level as traditional wireline calling did not exist 18 months ago, and are still in development and implementation. The means to providing comparable levels of service is similar to that adopted with respect to wireless 9-1-1 calls. A glossary of new terms used to describe this emerging technology can be found by accessing the CSEC website at [http://www.911.state.tx.us/files/pdfs/resources/VoIP_Deployment_Report_08_Mar07_\(Final\).pdf](http://www.911.state.tx.us/files/pdfs/resources/VoIP_Deployment_Report_08_Mar07_(Final).pdf).

IV. FCC Report and Order

On June 3, 2005, the Federal Communications Commission (FCC) issued a *First Report and Order* (the Order) requiring VSPs to provide their customers with E911 service. The Order is specifically directed at, and limited to, VSPs that provide customers with Interconnected VoIP Service. The deadline for compliance with the Order was November 28, 2005. None of the VSPs doing business in Texas fully complied with the implementation deadline, although a great deal of deployment

progress was made. The 9-1-1 Entities of Texas worked collaboratively with the VSPs to support and facilitate as much deployment as possible before the FCC's November 2005 deadline.

The Order also contained a Notice of Proposed Rulemaking (NPRM) seeking comment on additional steps the FCC needs to take to ensure that VSPs provide their customers with ubiquitous and reliable E911 service. A particular issue of concern was the geographic portability of the service and the lack of a reliable and automatic way for a customer's location information to be provided and updated without the customer's active participation. Additionally, the FCC sought input on the states' role in implementing the FCC's rules on VoIP E911. To date, the FCC has taken no official action on the NPRM except to receive comments and reply comments from interested parties. CSEC's original comments and its reply comments filed jointly with Emergency Communications Districts (Districts) can be viewed by accessing the CSEC website at:

[http://www.911.state.tx.us/files/pdfs/resources/VoIP_Deployment_Report_08Mar07_\(Final\).pdf](http://www.911.state.tx.us/files/pdfs/resources/VoIP_Deployment_Report_08Mar07_(Final).pdf).

V. VoIP Working Group

On April 20, 2005, CSEC established the Texas VoIP/9-1-1 Working Group. The purpose of the Working Group was to document the impact of VoIP telephony on 9-1-1 in Texas and explore potential solutions to identified problems. The Working Group, and its five subcommittees (Database, Operations, Revenue, Rulemaking, and Contracts), consisted of CSEC staff, the Districts (including Home-Rule Cities), the Office of the Attorney General of Texas, VSPs, third-party vendors, and traditional telecommunications carriers. As a result of the Working Group's efforts, standard procedures for implementing VoIP E911 were developed and implemented on a statewide basis and have been incorporated into the 9-1-1 Entities' service agreements with VoIP carriers and their underlying 9-1-1 solution providers. A preliminary report of the Working Group's efforts was presented at CSEC's November 10, 2005, open meeting.

As a result of the Texas VoIP/9-1-1 Working Group's efforts, forms and procedures for deployment were developed for 9-1-1 Entities, VSPs, and the third party vendors that provide VoIP Positioning Center (VPC) services and Emergency Services Gateways (ESGW). The Working Group collectively focused on the expeditious deployment of VPC services to assist the VSPs in meeting the FCC's deadline. VSPs have a choice of either contracting out the services of the VPC or performing the services in-house. Currently there are no VSPs that perform the functionality of a VPC. There are three VPC providers that service the state of Texas at this time. The VPC is the essential element in delivering the location information for a nomadic VoIP 9-1-1 call. By focusing on deployment of VPC services, the deployment of VSPs was accelerated.

At CSEC's September 22, 2005, open meeting, the Working Group was authorized to post questions and/or a strawman rule of VoIP E911 standards for comment in the *Texas Register*. To date, such postings have not been necessary as the 9-1-1 Entities and VSPs have incorporated the necessary standards and procedures into the appropriate Service Agreement(s). CSEC staff will continue to assess the need for a rule or program policy statement, and will make that determination after reviewing issues that arose during implementation of VoIP E911 or in entering into 9-1-1 Service Agreements with VoIP carriers.

VI. Technical Solutions

Because VoIP is a new technology interfacing with legacy 9-1-1 networks, a migratory technical solution path has been developed by the 9-1-1 community, the VoIP industry, and organizations such as the National Emergency Number Association (NENA). There are three categories of deployment that address nomadic VoIP. Only the Pre-i2 solution is in use today in Texas.

- Pre-i2 Solution - Routes calls to the correct PSAP with customer-provided location information (i.e., registered location) and call back number (i.e., ALI and ANI). Since the information provided to the PSAP by the customer's VoIP provider may not be validated against 9-1-1 authority Master Street Address Guide (MSAG), there is less expectation of correct or accurate location and dispatch information or call back number. Call takers should use extra care to verify with the caller the location for each 9-1-1 call.
- i2 Solution - Routes calls to the correct PSAP with 9-1-1 MSAG validated registered location information and call back number. NENA has developed technical standards for this solution. However, implementation of the i2 solution has not been feasible in initial deployments due to this solution's dependency on establishing new core technical functions such as Validation Databases (VDBs) and Emergency Routing Databases (ERDBs). These new technical functions have not been fully deployed in the state of Texas.
- i3 Solution – The Next Generation of 9-1-1. Provides for end-to-end internet protocol (IP) call routing and fully enhanced 9-1-1 functionality to the PSAPs. The architecture and detailed requirements for this solution are under development by NENA and other standards bodies.

VII. Deployment Status

Pre-i2 Deployment: The CSEC is working collaboratively with the Districts (including Home-Rule Cities) to track statewide Pre-i2 deployment by the VSPs and their third party VPC vendors. There are three VPCs that are deploying in Texas as of today. They are Intrado, TCS, and, HBF (which has not yet deployed in the CSEC

program but is preparing to do so). The following is a breakdown of the deployment activity to date.

- CSEC – The CSEC reports 347 VOIP capable PSAPs. TCS reports 315 deployed. Intrado reports 239 deployed.
- Districts – The Districts report 170 VOIP capable PSAPs. TCS reports 152 deployed. Intrado reports 130 deployed. HBF reports 64 deployed.
- 9-1-1 HRCs – The 9-1-1 HRCs report 26 VOIP capable PSAPs. TCS reports 22 deployed. Intrado reports 17 deployed. HBF reports 6 deployed.

i2 Deployment: There are no i2 deployments in Texas due to technical implementation and resources issues, including:

- No development for the Location Information Server (LIS) and the Route Discovery Operator (RDO).
- It has not been feasible in initial deployments to establish new core technical functions such as Validation Databases (VDBs) and Emergency Routing Databases (ERDBs).

The Texas 9-1-1 Alliance of Districts is currently participating in a Request for Proposal for VDB and ERDB services to address these technical implementation and resources issues, and meet the NENA requirements for an i2 architecture.

i3 Deployment Status: Architecture and detailed requirements under development.

VIII. Service Agreements

Historically, CSEC has developed model contracts for use by the regional planning commissions (RPCs) and the carriers providing services in their regions. Since the RPCs are responsible for administering 9-1-1 services in their respective regions, CSEC's model contracts are executed by the RPCs directly with the carriers.

In the past, CSEC's 9-1-1 model contracts were written for a particular type of certificated service provider, *e.g.*, facilities or reseller. The advent of Interconnected VoIP Service not only blurred carrier distinctions but also introduced wireless-like responsibilities that are being provided by new types of entities--VPCs and ESGWs. Additionally, the proliferation of wholesale carriers, who may or may not provide retail services, means that the entities contracting with the RPCs may be at least once-removed from the actual end-user customer. As a result, CSEC has re-written its model contracts to focus on the 9-1-1 solution (Fixed ALI or Dynamic ALI) being deployed by a carrier rather than the type of carrier, and to assist the RPCs in

exercising greater oversight over access to the 9-1-1 network and better control and tracking of those using the network. The types of model contracts are:

- **Fixed ALI Solution:** The Fixed ALI agreement is utilized by traditional telecommunications carriers, both facilities-based and resellers, and by those VSPs that only provide a fixed-geographic voice service (Fixed VoIP). Carriers using the Fixed ALI solution include AT&TIS, Verizon Business, and cable telephony providers such as Time Warner, Cox, and Comcast.
- **Dynamic ALI Solution:** The Dynamic ALI agreement is used by those carriers that offer wholesale and/or retail voice service that enables a customer to geographically change the location of their voice service (Nomadic VoIP). Carriers using the Dynamic ALI solution include Vonage, AT&T Call Vantage, Verizon Voice Wing, and Packet 8.

As part of the Dynamic ALI agreement, a carrier is responsible for providing both VPC and ESGW functions—two critical components of the Dynamic ALI solution. However, in recognition that carriers will likely rely upon third-party vendors for such functions, CSEC has created separate VPC and ESGW model agreements to certify and enable third-party entities to perform these functions on a carrier's behalf.

Status of Agreements

CSEC's Fixed ALI Model Agreement is finalized and has been in use for several months. Revisions to the agreement are periodically made to address issues occasioned by a carrier's business model and to align the agreement to the extent possible and necessary with the Dynamic ALI agreement.

CSEC's Dynamic ALI Model Agreement is likewise finalized and has been executed with a few carriers, with several more in the process of reviewing the agreement. Revisions to the agreement are continuing to be made to address issues arising during deployment. In October 2006, CSEC compiled a list of VSPs that possibly provide service in Texas and sent each a letter of inquiry offering its assistance in facilitating their implementation of the FCC's Order. To date, few responses to the letter have been received and CSEC staff has begun contacting such VSPs directly.

CSEC's VPC and ESGW Model Agreements are also finalized and have been made available to the known VPC and/or ESGW entities. The Texas 9-1-1 Alliance of Districts has agreements with the three known VPC entities and the two known ESGW entities.

All of CSEC's model agreements continue to be monitored and modified to address issues arising during VoIP 9-1-1 deployment.

IX. Service Fee Remittances

As authorized by Health and Safety Code § 771.071, each service provider is to bill and collect from its customers the 9-1-1 service fee on each local exchange access line. In the CSEC program area, the service provider then remits the collected fees to the Comptroller of Public Accounts for deposit into the 9-1-1 services fee account.

In February 2005, the CSEC amended Rule 255.4, *Definition of a Local Exchange Access Line or An Equivalent Local Exchange Access Line*, in order to include in the definition the facilities relied on by VSPs between an end user customer's premises and the service provider's network to provide the 9-1-1 access. The fee is \$.50 per month in the CSEC program area.

Statistical reports provided by the Comptroller reflect that some Fixed and Nomadic VSPs have begun to remit the emergency service fee. Remittance of the service fee provides funding for the network operations, database functions, and 9-1-1 customer premise equipment that are required to provide 911 services and deliver telephone number and location information to a PSAP. To date, no nomadic VSP has requested reimbursement of its costs from the CSEC/RPC program, but fixed VoIP providers with a PUC certificate may have sought 9-1-1 trunking reimbursement in accordance with PUC rule.