E911 Services and the VoIP Environment

Wednesday, October 26
1:30 – 3:00 p.m.
Veronese 2502
Vonage E911 Deployment
Vonage looks forward to a successful year and long partnership with the 9-1-1 community to work together to resolve issues related to the current IP solution, and on the joint development of the next generations of 9-1-1 services.

2001 – 2003
- Research and Development
- Market Testing
- Product Launch

2004
- National Retail Launch
- Global Expansion Commences with Canada and the U.K.
- Rhode Island E9-1-1 Deployment
- Advocacy for Complete 9-1-1 Access

2005
- Aggressive 9-1-1 Deployment and Implementation
- Continuing Global Expansion
- Wi-Fi Phone Launch
- Videophone Launch
Above and Beyond the FCC E9-1-1 Order

• **Immediate Response: Aggressive Technical, Operational and Policy Leadership**

  • **Vonage E9-1-1 Enforcer:**
    Web based customer application that requires E9-1-1 service system sign-up. All Vonage subscribers MUST register E9-1-1 location.

  • **Vonage “Safety-Net” 9-1-1 Call Center:**
    In the event a customer cannot connect directly to 9-1-1 through the native 9-1-1 network, 10-digit emergency routing, or has an address that is not valid, calls will be sent to a national call center for re-routing to proper emergency authority. APCO 33 trained call takers.

  • **Recognition that 9-1-1 is a Partnership:**
    Working with ILEC’s, Regulatory Leaders, Public Safety Professionals and all parties involved in 9-1-1.

  • **Vonage E9-1-1 Deployment: New York City and Rhode Island. Actively Testing other Markets:**
    Deployed E9-1-1 in New York City following six months of negotiations and active project management.

  • **Vonage PSAP and 9-1-1 Outreach:**
    20/20 Outreach, NENA, APCO and More, [www.vonage.com/PSAPcenter](http://www.vonage.com/PSAPcenter)
Vonage E9-1-1 Approach

- Vonage is pursuing multiple E9-1-1 paths and approaches to ensure success:
  1. Implementation of Multiple ESGW (Gateways)
  2. PSAP Outreach and Deployment
  3. National Interconnection and Network
  4. Wireless like Methods for Transmitting Calls (pANI, Shell Records, ESN)
Vonage E9-1-1 Approach

9-1-1 is a Shared Responsibility, Partnership and Functionality

1. Vonage Network
2. Over 500 plus Selective Routers
3. Provisioning of 9-1-1 System Service Provider Elements and Support (ILEC)
   1. Shell Records (Format for PSAP to “receive” information)
   2. ALI Record Steering for VoIP
   3. Emergency Service Query Keys (unlock selective routers)
   4. VoIP ESN (Emergency Service Routing Numbers)
   5. Support Data and 9-1-1 Information, (Master Street Address Guides)
4. PSAPs Must be able to Receive Calls
   1. Order Shell Records and Provide Data
   2. Vonage, ILEC and VPC Testing
   3. Go Live Notification
Enhanced 9-1-1 Call Flow Diagram (ESGW)
E9-1-1 Implementation and Deployment

- **PSAP outreach and “Deployment Kits”**
  - Verify and collect PSAP specific information

- **Integration scheduling with PSAP**
  - Operational Procedures, Testing and Updates

- **Aggressive deployment timeline (120 days)**
  - Implement voice path access to selective router / 911 tandem
  - Implement data path access to ALI
  - Establish real time update of regional ALI
  - Timely provisioning of ESRN and ESQK numbers
  - Shell record creation by 9-1-1 System Service Providers
  - ALI updates by System Service Providers and Vendors
  - Voice trunk flow and ALI data delivery inter-opt testing

- **Delivery of “Go-Live” notifications**

- **Vonage “Standard Operating Procedures (SOPs)” for ongoing communications and problem resolution**
  - Vonage NOC, 24x7x365 Access and Safety Net Call Center
  - Misrouted Call Procedure
Vonage and VoIP E9-1-1 Needs and Concerns

- Access to Selective Router / 9-1-1 Tandem for voice trunk termination
- Identification and Resolution of PSAP exceptions
- Ability to acquire and provision ESQK pools, p-ANI and other 9-1-1 elements
- MSAG data access for address validation
- Misrouting of Calls and Call Center Needs
- Real time update access to ALI database through wireless-like methods
  - ALI Steering
  - PAM Interface (wireless methods)
  - Other industry recognized standards
- State Updates and Leadership
  - Non-Discriminatory Access
  - Support and reinforce leadership (WiCAPs 1999 & ENHANCE 911 Act of 2004)
  - Statutes, laws and liability parity
  - E9-1-1 advancements (statewide networks, mapping and addressing)
  - Shared consumer awareness and education
Vonage’s E9-1-1 Concerns:

- **ILEC Roles 9-1-1 System Service Provider**
  - ESQK, p-ANI Access
  - Shell Records
  - Uniformed record to pull information off the router, similar to wireless;
  - Uniformed formast (PSAP customer)
  - Vonage is requesting set of ESQK’s (p-ANI) for VoIP
  - Limitations given current system, characters, etc.

- **Concerns**
  - Timely and Non-Discriminatory Access
  - MSAG Validation
  - VoIP ESN?
  - Wireless model;
  - Integration with CAD systems and other PSAP methods may vary
Vonage E9-1-1 Deployment

- **9-1-1 Outreach, Deployment and Implementation**
  - Sharing of relevant 9-1-1 data
  - Selective Router (SR) access points
  - PSAP jurisdictional boundaries
  - Vonage Deployment Kit Follow Up
  - Communicating the VoIP Solution
  - Sharing rollout plans
  - Targeting Vonage Footprint
  - Testing capabilities
  - Vonage will provide ANI and ALI
  - ANI will be populated by Vonage
  - ALI is provided through customer provisioning process
  - Vonage’s goal and long term priorities include MSAG validation
Keys to Success: Vonage E9-1-1 Deployment

- **Communication, Cooperation and Coordination**
  - Vonage is a 9-1-1 partner
  - Ensuring and requesting that IP providers have equal and immediate access to the native 9-1-1 system through Selective Routers and other native 9-1-1 methods
  - Sharing any special addressing requirements (p-ANI) that we need to be aware of for MSAG validation
  - Assigning appropriate 9-1-1 staff contacts and project managers for IP implementation (technical, operations and policy)
  - Operations issues are on-going partnership and require all levels of leadership (national, state and local)

[www.vonage.com/PSAPcenter](http://www.vonage.com/PSAPcenter)
VoIP Implementation:
A View from Above

Monica A. Marics

October 2005

Intrado © 2005
VoIP E9-1-1

Successful implementation is a partnership

- Caller & CPE
- VoIP Service Provider
- VoIP 9-1-1 Provider
- 9-1-1 Service Provider
- PSAP
VoIP E9-1-1

From 50,000 feet

– Where is the caller?
– Which PSAP should receive the call?
– How to get the call to the PSAP?
– What information to deliver with the call?
Where is the Caller?

20,000 foot view
- Caller provides location to VoIP Service Provider (VSP) during provisioning process, or
- Location provided concurrent with 9-1-1 call request

5,000 foot view
- Location Information Server (LIS)
- CPE solutions – GPS, RF, etc.
- Network solutions – Jacks, Access Points, etc.
Which PSAP should receive the call?

- **20,000 foot view**
  - PSAP Boundaries
  - Wireline versus Wireless PSAPs

- **5,000 foot view**
  - ESN Boundaries for Police, Fire, Ambulance
  - Boundary maintenance and local government contacts
  - Business rules per PSAP
How to get the call to the PSAP?

20,000 foot view
- Routing instructions for call (ESRN, ESQK)
- Selective Router serving PSAP
- Physical access to the Selective Router
- Provisioning of Selective Router
How to get the call to the PSAP?

5,000 foot view

- ESRNs
  - Assignment of ESRNs by VoIP Service Provider (VSP) or VoIP Positioning Center (VPC)
  - Assignment at PSAP or ESN boundary
- Selective Router connectivity
  - Direct connection to Selective Router
  - Connectivity via 3rd party agreement
  - Gateway access to Selective Router network
- Provisioning at Selective Router
  - Shell records
  - Trunk groups
  - Default routing
  - ESNs
What information to deliver with the call?

20,000 foot view
- Call Back Number (CBN)
- Automatic Location Identification (ALI)

5,000 foot view
- Address type, Civic or MSAG
- Address origin, User or CPE or Network
- Address accuracy, point or WiFi range
- X,Y coordinates
Coming in for a Landing

▶ VoIP 9-1-1 is complicated
  - More than Wireline or Wireless (1+1=3)
  - “The Devil is in the Details!”

▶ Solutions exist
  - Consistent with existing FCC Order requirements
  - Native 9-1-1 network call delivery
  - MSAG address and call back number to PSAP
  - Limit impact to public safety process and procedures
Thank You

Questions?

Contact Information

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  V.P. Product Management
  Intrado Inc
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Satisfying 911 in a VoIP World
Core Components of 911 Emergency Calling

1. Identify Emergency Call – different markets around the world have different identifiers for Emergency calls

2. Basic 911- Route the Emergency Call to the appropriate Public Safety Answering Point (PSAP) for current caller location
   - Straight forward for Fixed line locations
   - Much more complicated for Mobile and Nomadic users
     - ATIS / NENA requirements
     - Apply correct QoS to insure call pathways exist

3. E911- Deliver caller location with full support of Regulatory requirements (e.g. – Operator Ringback with B-party call control in selected markets)
Different business and network models for supplying 911 to stationary subscribers

- Carriers have choices regarding support of 911 requirements
- Own the responsibility
  - Emergency Call routing
  - CAS/SS7 trunking off the Media Gateway to Tandem switch to PSAP.
- Outsource the PSTN interwork responsibility by using 911 business partners (e.g. CLEC’s)
  - Use SIP Peering or ISUP connectivity to partner who then routes and terminates emergency call to the PSTN
E911 – Carrier Owns the Responsibility

Subscriber Call requests can be processed as priority if ESP is activated.

Routes and Trunk seizure can be prioritized if the TGRP ES COS is activated.

ALI = Automatic Location Identifier
PSAP = Public Safety Answering Point, via an EO and E911 Tandem
E911 – Carrier Outsources the Responsibility

Subscriber Call requests can be processed as priority if ESP is activated.
Summary

• VoIP B-911 & E-911 for VoIP fixed Line deployed worldwide today

• Mobile & Nomadic E911 planned according to ATIS / NENA I2 & I3 requirements

• Location determination
  ▪ Mobile
    ▪ UTDOA (Uplink Time Difference Of Arrival), WA-GPS
  ▪ Nomadic
    ▪ GPS, DHCP: geo + civic

• Rollout & Business Model
  ▪ Build own network
  ▪ Outsourced
  ▪ Charging models
“Thank You For Your Attendance”

Visit us at Siemens Booth # 211 for further info.

Contact : Peter Hage , Solution Management
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Office: (978)-923-3354
VoIP E9-1-1

The 9-1-1 Service Provider’s Perspective

Maureen Napolitano
Verizon
Director National E9-1-1
October 25, 2005
TELECOM ‘05
How Will E9-1-1 be cared for?

- FCC issued mandate on E9-1-1
  - By 11/28/05, VoIP providers must deliver ANI / ALI to PSAPs connected to an E9-1-1 selective router
  - Order issued in 7/05 . . . Aggressive timeline to Provision . . . 4 Months!!
  - Did not specify that address has to be MSAG valid . . Instructed VoIP providers to deliver ‘registered location’ as supplied by the customer
  - Unlike wireless, PSAPs do NOT request service . . Must be ready to accept!

- VSPs have contracted with 3rd party database providers and CLECs to deliver E9-1-1 service
  - 3rd party providers will provide ALI information and determine routing instructions
    - Provide VPC functionality
  - Existing CLEC trunks may be used to transport call to our E9-1-1 selective routers or direct trunking to the 9-1-1 Selective Routers
  - 2,000 PSAPs connected to about 150 E9-1-1 selective routers in VZ footprint!
How Will E9-1-1 be cared for?

- Cable companies (and other CLECs) are delivering VoIP and traditional landline calls over same trunks because most of their customers are ‘static’ users
  - No distinction made on type of call
VZ Activities to Meet Deadline

- Assign pANIs upon request from 3rd party provider
  - Will use ‘211’ compared to ‘511’ for wireless

- Create VoIP MSAG shell record to allow 3rd party to load pANIs
  - ESN is critical element in establishing this record
  - PSAPs must make decision on what trunks to accept calls (landline or wireless or new)
  - Outreach campaign underway
  - Build ‘steering table’ to direct ALI query to 3rd party

- Activate PSAP steering

- Resolve testing/implementation issues with appropriate parties

- Educate 3rd party providers/VoIP providers on need for PSAP process to transmit ‘ALI discrepancies’ and ‘No Record Found’ conditions
VoIP Deployment - In Progress

- Current Deployments
  - NYC since 7/7/05

- Working Collaboratively with Intrado, HBF + TCS

- Testing In Progress Many VZ States
  - MD, PA, VA, MA

- State Oversight and Guidance
  - Texas
  - California
Challenges Ahead

“ Well we have till 11/28 !!!!”

Address Validation
- Postal vs. MSAG
- Customer Understanding of Where They Are
- Whose Problem IS It Anyway ???
  - Nomadic Knowledge
- Interactive Presentation of Alias, Descriptive Addressing

Availability of Responding Agency Information
- Police, Fire+EMS

Post Implementation Root Cause
ESIF is the primary venue for the telecommunications industry, public safety and other stakeholders to generate and refine both technical and operational interconnection issues to ensure that life-saving E9-1-1 service is available for everyone in all situations.

ESIF enables many different telecommunications entities to fully cooperate and interconnect with each other to determine the best practices and solutions necessary to effectively and promptly deploy E9-1-1 services.
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<th>ESIF Industry Participation</th>
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ESIF Successes

PSAP Readiness-Issue 12
Developed to supply PSAPs with a method to verify readiness and provide carriers with complete information to speed the Wireless PHASE 1 + 2 implementation process.

Wireless 9-1-1 Emergency Information Request Fax-Issue 23
Created in order to establish an acceptable generic national procedure for wireless carriers (network and resale providers) to provide current/prior customer information to PSAPs in emergency situations and/or cases of fraudulent use of 9-1-1.
The FCC has established accuracy requirements for network and handset based location solutions for Enhanced 9-1-1 emergency call services (found in the Commission’s Third Report and Order, adopted September 15, 1999).

ESIF identified the need for industry-accepted requirements for testing the accuracy performance of Wireless E-9-1-1 Phase II systems. This document provides a common frame of reference that individual stakeholders can use to validate the accuracy methodology of 9-1-1 location technologies.
EMERGENCY SERVICES MESSAGING INTERFACE TASK FORCE

Protocol and network architecture between the PSAP and Emergency Services Network has not substantially changed since its introduction approximately 30 years ago.

Barrier to advancing emergency services and evolving the role of the 9-1-1 PSAP call taker.

Define a new messaging and interaction protocol between PSAPs and Emergency Services Networks that goes significantly beyond the paradigms that exist to provide those services today (To be crafted as an American National Standard).
IP Coordination AD HOC Sub Committee

Establish a close working relationship with the NENA VoIP/Packet Technical Committee

Develop a process to review the work being developed in the NENA VoIP/Packet Technical Committee

Submit consensus documents and contributions to the NENA VoIP/Packet Technical Committee, and/or other NENA Technical Committees.

Assist the NENA VoIP/Packet Technical Committee in adapting the results into a formal standards requirement document (SRD) for submission through ESIF for end-to-end, ANSI standards development and implementation.
**Conclusion**

9-1-1 is **THE most important number a Citizen can Dial**

ATIS and its ESIF share the FCC’s focus on the need for cooperative measures to deploy and evolve E9-1-1 services and systems.