NEXT GEN RECORDING & QUALITY ASSURANCE: ARE YOU READY?
• Introductions
• Next Gen Recording
  • What’s Different in NG9-1-1
  • Recording as a Service (RaaS)
  • Text-to-911 Recording
  • CAD Integration
• Quality Assurance and Improvement (QA/QI) Best Practices
• Audio Analytics
• Questions & Answers
What is NG9-1-1?

- Collaboration
- Multimedia
- New private IP network
- New standards
What Defines an NG9-1-1 Environment?

NG9-1-1 is a functional framework that provides services that work in harmony:

1. ESInet as ‘Network of Networks’
2. Geospatial policy-based routing
3. Compliance with NENA’s i3 standards
NG9-1-1 High Level Objectives

Higher service level to the public

- **Increase Reliability**
  - Secure, broadband IP network
- **Increase Capacity**
  - Interconnect PSAPs and other agencies in a standards-based way
- **Increase Sharing** of Resources, Information and Costs
  - Share CAD, RMS, CPE, recording system, and other applications
  - Consolidation (Virtual or Physical)
- **Increase Capabilities**
## Increased Capabilities: NG9-1-1 vs. 9-1-1

<table>
<thead>
<tr>
<th>Capability</th>
<th>E9-1-1</th>
<th>NG9-1-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice Calls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Transfer Misrouted Calls</td>
<td>Limited Capability</td>
<td>Yes</td>
</tr>
<tr>
<td>Location Delivery with Calls</td>
<td>No</td>
<td>Yes*</td>
</tr>
<tr>
<td>Policy Based Call Routing</td>
<td>Managed by E9-1-1 SSP</td>
<td>Managed by 911 Authority</td>
</tr>
<tr>
<td>Text / Multimedia</td>
<td>No</td>
<td>Yes*</td>
</tr>
<tr>
<td>Additional Data</td>
<td>No</td>
<td>Yes*</td>
</tr>
<tr>
<td>Data Sharing Across Regions</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Data Sharing with Responders</td>
<td>Limited Capability</td>
<td>Yes</td>
</tr>
<tr>
<td>Virtual PSAPs</td>
<td>Limited Capability</td>
<td>Yes</td>
</tr>
<tr>
<td>Standard IP Interfaces</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* These services require Next Generation originating networks as well as NG9-1-1.

Source: NG9-1-1 “Explained” - EENA
NG9-1-1 = More Media & Data to Record and Manage

- **TEXT-TO-911**
- **SCREENS**
- **TELEMATICS**
- **TELEPHONY**
- **VIDEO**
- **PHOTOS**
- **RADIO**
NG9-1-1 Logging & Recording Requirements

- Logging as a core service function
- Any i3 Functional Element with Session Recording Client could nominate the NICE Recorder as its Logging Service
- From the NENA i3 Standard Draft 2:
  - All forms of media must be logged
  - Media recording should begin at the earliest point possible
  - Recording media both at or near ESInet ingress and within a PSAP is desirable
  - Implement a Session Recording Protocol (SIPREC) interface for recording the media and associated metadata
How NG9-1-1 Works: Call Media Flow

1. **Legacy or IP Endpoint Makes a Call via Any Form of Media**
   - PSTN
   - MOBILE / TEXT
   - SIP

2. **Caller Location Info Retrieved on Demand**
   - PSTN NETWORK

3. **All Media Converted to SIP Signaling**
   - ESINET

4. **Call Routed to the right i3 PSAP per ESRP**
   - i3 PSAP

5. **SIP Invite Triggers Recording and SIP BYE Event Terminates Call & Data Recording**
   - ESRP
   - GEOSPATIAL POLICY-BASED ROUTING
Recording as a Service (RaaS)

i3 Logging & Recording system residing in the ESInet (or other cloud)

Matrix technology enables a hybrid of hosted and on-premise applications

PSAP

Transparent View
Benefits of Recording as a Service (RaaS)

- True cradle-to-grave incident recording
- Easily share incident information across regional ESInet agency members
- No need to maintain your own servers
- Multi-tenancy support – split costs with other agencies
- 2N Redundancy
- More deployment flexibility
- Easy to manage change
- Access to more powerful, up-to-date software
Bridging in Services and Transferring Calls

NENA i3 Standard
Section 5.8 Bridging

Source: Mark J. Fletcher, ENP, Avaya
Bridging in Services and Transferring Calls

Multimedia Conference Bridge

- Additional Data
- 9-1-1 Caller
- SMS / MMS
- Poison Control
- Language Translation
- Social Services
- Multimedia Session Recording
- Primary PSAP
- Secondary PSAP

Source: Mark J. Fletcher, ENP, Avaya

NENA i3 Standard
Section 5.8 Bridging
Bridging in Services and Transferring Calls

Source: Mark J. Fletcher, ENP, Avaya
TEXT-TO-911 RECORDING
Text-to-9-1-1: A Milestone on the Road to NG9-1-1

First multimedia interaction with PSAP

Uses to functional elements of NG9-1-1 architecture

FUTURE

Text-to-9-1-1

NG9-1-1 and Beyond
Text-to-9-1-1 Deployment Status

- Over 700 PSAPs deployed in 39 States
- All PSAPs in ME, NH, VT and IN are text-to-911 ready

Source: FCC Report, as of 8/17/2016
Text-to-9-1-1 Deployment Status

Text-to-911 by Delivery Method

- Direct IP: 36%
- Text to TTY: 20%
- Web Browser: 44%

Source: FCC Report, as of 8/17/2016
Direct IP / Integrated Text Handling

How it works
• Text handing integrated into 911 call handing software
• Private IP (ESInet) connection to Text Control Center

Benefits
• Elegant way to process both calls and text in same interface
• Future proof i3-based solution
• Voice capacity not impacted as texts travel across separate networks
• Robust metadata available:
  • Texter #
  • Location
  • Position ID
  • Time stamp

Source: Airbus DS Communications
Web Interface

How it works

- Web browser on workstation connected to public Internet

Pros

- Easy to deploy and intuitive
- Works with standard Web browser
- Voice capacity not impacted - texts travel across separate networks

Cons

- Internet connectivity can pose SLA and security constraints, PSAP responsible for firewall configuration
- Separate application screen adds to desktop real-estate
TTY – Text Telephone

How it works

1. SMS converted to TTY before it is sent to 9-1-1 network
2. TTY messages sent to PSAP’s Selective Router for delivery to the PSAP TTY call station
3. PSAP bids ALI with ESRK/p-ANI for coarse (e.g. cell site) location of the subscriber

Pros

• Use of existing voice call paths

Cons

• No simultaneous text messaging (Half-duplex)
• Limited character set - potential for garbling (TTY is based on Baudot tones)
• Additional texting load may require additional trunking
### Export of Text Conversation including Captured Data

**Call Logs**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Time</td>
<td>2015-09-01 00:00-00:00</td>
</tr>
<tr>
<td>Duration</td>
<td>00:00</td>
</tr>
<tr>
<td>Resource</td>
<td>Brad Smith, FDN-Demo</td>
</tr>
<tr>
<td>Agency/Class</td>
<td>FD</td>
</tr>
<tr>
<td>AGENCY</td>
<td>13</td>
</tr>
<tr>
<td>Carrier/Alias</td>
<td>CRICKET WIRELESS</td>
</tr>
<tr>
<td>Car1ID</td>
<td>26</td>
</tr>
<tr>
<td>Latitude</td>
<td>38.73885</td>
</tr>
<tr>
<td>Longitude</td>
<td>-86.17484</td>
</tr>
<tr>
<td>Location</td>
<td>(404.096 38.748)</td>
</tr>
<tr>
<td>Media Type</td>
<td>Text</td>
</tr>
<tr>
<td>Message Direction</td>
<td>OUT</td>
</tr>
<tr>
<td>Message Type</td>
<td>Text</td>
</tr>
<tr>
<td>Operator/Alias</td>
<td>Brad Smith</td>
</tr>
<tr>
<td>Operator ID</td>
<td>1</td>
</tr>
<tr>
<td>Other Party/Number</td>
<td>610-851-6666</td>
</tr>
<tr>
<td>Priority</td>
<td>High</td>
</tr>
<tr>
<td>Rating</td>
<td>2.4</td>
</tr>
<tr>
<td>Raw Message</td>
<td>Help I crashed my car</td>
</tr>
<tr>
<td>Sequence</td>
<td>23</td>
</tr>
<tr>
<td>Text Body</td>
<td>A patrol car is on the way. Please stay out of the road. If you have any other problems please text again.</td>
</tr>
<tr>
<td>Text SequenceID</td>
<td>425</td>
</tr>
<tr>
<td>Time Stamp</td>
<td>2015-09-01 00:00-00:00</td>
</tr>
</tbody>
</table>

**Call Logs Details**

<table>
<thead>
<tr>
<th>Time Stamp (Local time)</th>
<th>Caller ID</th>
<th>Text Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-09-01 00:05-05:00</td>
<td>Brad Smith, FDN-Demo</td>
<td>Help I crashed my car</td>
</tr>
<tr>
<td>2015-09-01 00:10-10:00</td>
<td>610-851-6666</td>
<td>Your message has been received by 911 and will be responded to shortly. If this is an emergency and you are able to make a voice call to 911, please do so.</td>
</tr>
<tr>
<td>2015-09-01 00:15-15:00</td>
<td>610-851-6666</td>
<td>Hello, what is your location? Are you able to make a voice call to 911?</td>
</tr>
<tr>
<td>2015-09-01 00:20-20:00</td>
<td>Brad Smith, FDN-Demo</td>
<td>No, we can't.</td>
</tr>
<tr>
<td>2015-09-01 00:25-25:00</td>
<td>610-851-6666</td>
<td>Understood. Can you confirm your location please?</td>
</tr>
<tr>
<td>2015-09-01 00:30-30:00</td>
<td>Brad Smith, FDN-Demo</td>
<td>Room 89 about 1 miles north of Livingston.</td>
</tr>
<tr>
<td>2015-09-01 00:35-35:00</td>
<td>610-851-6666</td>
<td>Are you injured?</td>
</tr>
<tr>
<td>2015-09-01 00:40-40:00</td>
<td>Brad Smith, FDN-Demo</td>
<td>Negligible.</td>
</tr>
<tr>
<td>2015-09-01 00:45-45:00</td>
<td>610-851-6666</td>
<td>Do you need an ambulance?</td>
</tr>
<tr>
<td>2015-09-01 00:50-50:00</td>
<td>Brad Smith, FDN-Demo</td>
<td>No.</td>
</tr>
<tr>
<td>2015-09-01 00:55-55:00</td>
<td>610-851-6666</td>
<td>Where any other vehicles involved?</td>
</tr>
<tr>
<td>2015-09-01 01:00-00:00</td>
<td>Brad Smith, FDN-Demo</td>
<td>No. — I ran my car into a ditch — can't drive at all.</td>
</tr>
</tbody>
</table>
CAD INTEGRATION
Add More Context to Your Recordings

Associate valuable CAD data with recorded communications:

- Incident ID
- Incident Location
- Incident Type
- Incident Severity
- Incident Status
- Comments
CAD Details Displayed on Incident Reconstruction Timeline

Planned future release
“CAD Integration takes away the guesswork from trying to match CAD records to audio recordings – it does it for us automatically. It has cut our audio request processing time in half. Now we can get back to our other work.”

– Karin Marquez, Communication Supervisor, Westminster Police Department, Colorado
QUALITY ASSURANCE & IMPROVEMENT (QA/QI)
“All of the training in the world is useless if the professional telecommunicator isn’t being continuously monitored and reinforced for proper procedures.”

- APCO NENA QA/QI ANSI Standard Foreword
Highlights of APCO/NENA QA/QI Standard

APCO/NENA ANSI 1.107.1.2015 Standard for the Establishment of a Quality Assurance and Quality Improvement Program for Public Safety Answering Points
Collaborative Effort

- APCO
- Denise Amber Lee Foundation
- IAED
- NENA
- PowerPhone
- PSAP Leaders
Overview

- Starting point for any size agency
- No cost
- Voluntary (not mandatory)
- Easy to implement
- Complete system for all call types
- Vendor/product agnostic
Position and Discipline Monitoring

Consistently administered and randomly selected review of recordings

- Call taking for police incidents
- Dispatching police incidents
- Call taking for fire incidents
- Dispatching fire incidents
- Call taking for EMS incidents
- Dispatching EMS incidents
QA Review Process Guidelines

Review in the normal course of business:

- **At least 2% of all calls for service**
  
  When the 2% factor would not apply or be overly burdensome due to low or excessively high call volumes, agencies must decide on realistic levels of case review.

- **All cases involving catastrophic loss and/or high-acuity events** – as soon as possible after the receipt of the call and/or following the radio dispatch or at least within 5 days.

- **Any other call or event types as defined by your agency**

Typical QA Workflow

**DAY 1**

- Search through CAD records
- Sudden Emergency
- Begin search in Logging Recorder
- Get distracted
- Return to search in Recorder
- Burn recordings to CD and send to QA
- QA evaluator scores call in spreadsheet
- Supervisors receives print out
- Call taker receives instruction
- Supervisors receives instruction

2 TO 4 WEEKS
Recordings Automatically Selected for QA Evaluation

EVALUATOR TO-DO LIST

<table>
<thead>
<tr>
<th>Evaluation name</th>
<th>Form</th>
<th>Operator</th>
<th>Assigned to</th>
<th>Created by</th>
<th>Evaluated by</th>
<th>Completed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brian Gibbons</td>
<td>Call Center</td>
<td>Gibbons, Brian</td>
<td>Davis, Fred</td>
<td>Davis, Fred</td>
<td>Davis, Fred</td>
<td>Davis, Fred</td>
</tr>
<tr>
<td>Dave Jones</td>
<td>new form</td>
<td>Jones, Dave</td>
<td>Davis, Fred</td>
<td>Davis, Fred</td>
<td>Davis, Fred</td>
<td>Davis, Fred</td>
</tr>
<tr>
<td>Fred Davis</td>
<td>Call Center</td>
<td>Gibbons, Brian</td>
<td>Gibbons, Brian</td>
<td>Gibbons, Brian</td>
<td>Gibbons, Brian</td>
<td>Gibbons, Brian</td>
</tr>
</tbody>
</table>

Increase the Productivity, Objectiveness & Consistency of Your Quality Assurance Program

QA FORM OPENS UP WITH INCIDENT RECORDING

2X Evaluator Productivity
We used to struggle to perform 90 QA checks a month. Now we are at 1,680 QA evaluations per month, and keep increasing.”

- Training and QA Supervisor
  Hamilton County 9-1-1, Tennessee
Hamilton County 9-1-1

- Serves 26 agencies, 130+ telecommunicators answering 2,000 to 2,500 calls per day
- Dispatches responders for law enforcement, fire and EMS
- Review and rate 5 to 12 calls per dispatcher per month
- Calls tagged with one of 150 CAD incident types are automatically categorized for QA via business rules:

- 7% EMS
- 7% FIRE
- 3% POLICE
Don’t Forget: QA Text Messages

16/05/2016 10:03:00
Help I crashed my car
610-851-6666

16/05/2016 10:03:10
Your message has been received by 911 and will be responded to shortly. If this is an emergency and you are able to make a voice call to 911, please do so.

Smith-AW-9842

16/05/2016 10:03:40
Hello, what is your location? Are you able to make a voice call to 911?

Smith-AW-9842

16/05/2016 10:03:00
610-851-6666
AQUA Call Playback Recording Integration

Reduce the time it takes to review calls by 50%
APCO Adviser 9-1-1 Call Recording Playback Integration

Reduce the time it takes to review calls by 50%
AUDIO ANALYTICS
“Give us every call related to an incident.”
Find Other Calls Faster with Audio Analytics
Advanced Search

Rapid Search on Pre-Indexed Content

Confidence Level

LOW            HIGH

Use Keywords & Call Data

Search Using NOT for Omitted Keywords
Monitor 100% of Calls with Audio Analytics

FIND CALLS BASED ON THE ABSENCE OF SPOKEN WORDS

- What is the **address** of emergency?
- Are you at that **location now**?
- What’s the **phone number** you’re calling from?
- What’s your **name**?
- Tell me exactly what happened.
- Is s/he **awake** (conscious)?
- Is s/he **breathing**?
Automatically Categorize High Risk Calls

- ABUSIVE LANGUAGE
- VULNERABLE CALLER
- PROMISE MADE
- REPEAT CALLS
- SENSITIVE HEALTH INFO
### Examples of Keywords Used to Create Categories

<table>
<thead>
<tr>
<th>Label</th>
<th>Matches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promise Made</td>
<td>&quot;assure you&quot;, &quot;be right there&quot;, &quot;has been notified&quot;, guarantee, promise</td>
</tr>
<tr>
<td>Drugs</td>
<td>cocaine, crack, drugged, drugs, heroin, joint, marijuana, meth, mushrooms, opioid, oxycodone, oxycontin, pot, vicodin</td>
</tr>
<tr>
<td>Repeat Calls</td>
<td>&quot;called a few&quot;, &quot;called already&quot;, &quot;called before&quot;, &quot;called earlier&quot;, &quot;called several&quot;, &quot;called twice&quot;, &quot;called two times&quot;, &quot;second</td>
</tr>
<tr>
<td>Vulnerable Caller</td>
<td>&quot;home alone&quot;, &quot;I am lost&quot;, daddy, grammy, grampy, hungry, hurting, mama, mommy, papa, scared</td>
</tr>
<tr>
<td>Sensitive Health Info</td>
<td>&quot;drinking problem&quot;, &quot;drug problem&quot;, &quot;substance abuse&quot;, AIDS, disease, HIV, STD</td>
</tr>
<tr>
<td>Abusive Language</td>
<td>&quot;come on now&quot;, &quot;cuss at me&quot;, &quot;do not mess with me&quot;, &quot;get it together&quot;, idiot</td>
</tr>
<tr>
<td>Non Emergency Calls</td>
<td>&quot;barking dog&quot;, &quot;burning leaves&quot;, &quot;cat in tree&quot;, &quot;dead animal&quot;, &quot;loud music&quot;, &quot;loud party&quot;, &quot;street light not working&quot;, &quot;traffic li</td>
</tr>
</tbody>
</table>
Thank You

We’re here to help.

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