Transition to NG9-1-1

David Holl, PEMA, Deputy Director of Administration
Why do we need to transition

• The migration to next generation networks represents a crucial opportunity to introduce a new paradigm whereby public safety is conceived of as an enterprise.*
• Public safety agencies must adopt a broader view of communications technology
• Embrace a converged system
• Transition away from specialized networks
• Individual public safety agencies will achieve greater communications capabilities if they are willing and able to work together and rely on communications technology that they may not exclusively own or control.

* TOWARD A NEXT GENERATION NETWORK FOR PUBLIC SAFETY COMMUNICATIONS
Dale N. Hatfield and Philip J. Weiser
Transition reasons

• Today’s 9-1-1 system is being outpaced by emerging technologies
  • Requires constant adaptation of legacy 9-1-1, is inefficient and can be expensive and slow
  • New communications technologies require “plug and play”
  • Data rich environment that is growing exponentially
  • Need for more bandwidth
  • Greater flexibility and a more easily controlled 9-1-1 system
  • Intercommunication with other emergency services
  • NG9-1-1 can be significantly more efficient
An ESInet is the building block to fully functional NG9-1-1

- Elements of an ESInet
  - IP Routing to local PSAP(s)
  - Bandwidth driven based upon applications at the PSAP
  - Gateway to larger Internet
  - Does not necessarily change the current routing of calls or the data retrieval

- ESInet can be local network or regional network
- IP based access network to receive calls
- Often the first step in creation of an interoperable solution between local agencies

ESInet framework **does not** include all of the components of i3 and is not fully functional NG9-1-1
Technical transition

• Legacy telecommunications supports single services, over single connections
  – Dedicated connections
  – Leads to duplication
  – Inefficient with technology currently available

• IP networking
  – Multiple services over a single connection
  – Meshed redundancy
  – Any to any connection
Legacy Technology vs IP Networking

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**Legacy Technology**

- Inefficient use of technology
- Single connection for each service
- Multiple contracts for each service

**IP Network**

- Technical efficiencies
- One connection
- One contract for service
- Multiple services
## NG9-1-1 transition

<table>
<thead>
<tr>
<th>Legacy systems</th>
<th>Next Generation systems</th>
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<tbody>
<tr>
<td>Virtually all calls are voice callers via telephones over analog lines</td>
<td>Voice, text, or video information, from many types of communication devices, sent over IP networks</td>
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<tr>
<td>Most information transferred via voice</td>
<td>Advanced data sharing is automatically performed.</td>
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<tr>
<td>Callers routed through legacy selective routers, limited forwarding / backup ability.</td>
<td>Physical location of PSAP becomes immaterial, callers routed automatically based on geographic location, enhanced backup abilities.</td>
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<td>Limited ability to handle overflow situations, callers could receive a busy signal.</td>
<td>PSAP’s able to control call congestion treatment, including dynamically rerouting callers</td>
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Awareness of current gaps

- **PSAPs problem**
  - Limited bandwidth
  - Multiple connections are costly
  - Constantly upgrading to meet new technology
  - Many are not IP capable

- **End User problem**
  - Rapid adoption of broadband capable devices
  - Any time communication
  - Multimedia capability on a device with more power than the PSAP
  - Moving to an IP based world for communications
PEMA Goals

- Implement a Commonwealth-wide strategy to implement NG9-1-1 in a consistent, precise manner while maximizing all available resources:
  - Public Safety 99.999% Grade ESINet deployed
  - Standards based approach (NENA i3 Standards)
  - Implement IP capable PSAPs
  - Geographic based routing and database integration
  - Deploy NG9-1-1 capable, shared applications
  - Converge networks and systems to a “system of systems”
  - Implement “Best Practices” approach
PEMA response to transition

- Develop statewide NG9-1-1 strategy
- Lead public safety in the application of next generation technology
- Provide broadband to every EOC and PSAP
- Operationalize statewide public safety communications network
- Enable operating expenditure savings for State and county governments and create sustainable solutions
- Eliminate silos and move toward an enterprise environment
- Remove duplication and enable shared services
- Incentivize regionalization and sharing
- Implement ‘Best Practices’ mode
- Reorganization from the top-down
- Use collaboration with cross functional departments to share broadband networks
Why transition to NG9-1-1

- NG9-1-1 changes the way calls are delivered to the PSAP
  - 9-1-1 calls are delivered using IP instead of legacy telecommunications
  - Legacy calls interface to the IP network
  - Calls remain the initial focus of NG9-1-1
  - Allows greater competition for 9-1-1
  - Causes a need for legislative and regulatory change
NENA i3 Network

Regional ESInet

Local ESInet

NENA Functional and Interface Standards for Next Generation 9-1-1
Migration steps

- Deploy the ESInet solution
- Implement NG9-1-1 functions based upon NENA standards
- NG9-1-1 includes
  - ESInet,
  - call handling infrastructure
  - PSAP interfaces

- The primary goal of NG9-1-1 remains processing, handling and delivering emergency calls
Additional NG9-1-1 Benefits

- Situational awareness
- Disaster recovery
- Redundancy
- Continuity of Operations
- Shared Video Conferencing system
- County-State EMA application sharing
- CAD sharing
- Enterprise telephony
- Call routing based upon location
- Open architecture, open systems model
- Radio system sharing
- Efficiency of costs, resources and applications
County

- What should I be doing?
  - Review applications, systems, networks
  - Assess bandwidth
  - Determine areas for collaboration, coordination
  - Regionalization alternatives
  - Expedite areas for greater sharing of resources
    - If a neighbor is building something does it make sense for me to join?
    - Often cheaper to get aligned earlier than later
    - Identify areas for Capital and Operational savings
• What should we be doing?
  • Collect comprehensive requirements definition from each county
  • Build governance solution to support region
  • Regional assessment of
    • Funding
    • Operations
    • Standards and Technology
    • Governance
• Increase sharing
  • Enhance the collaboration and build a cohesive shared system
  • Follow PEMA goals and objectives to achieve a state-wide shared ESInet solution to allow NG9-1-1 to be built
• What are we doing?
  • Assume greater leadership of program
  • Encourage regionalization
  • Authorize collaborative tools to complete assessments of:
    • Funding
    • Operations
    • Standards and Technology
    • Governance
• Provide greater input to counties
  • Build better operations capabilities
  • Develop business model approach to entire program
PEMA path to NG9-1-1

Policies and Procedures
- Statewide Technical Integration
- NG9-1-1 Plan / Functional requirements
- Policy support
- Procurement support
- GIS and Data support

Applications
- Core services
- Applications to support NG functions

Operations
- Integration of State SOP’s
- Development of local and regional SOP’s
- Training and education

Governance
- Interoperability
- Sharing of services
- Governance rules

Network
- Integration of common ESInets
- Creation of shared network of networks
- IP enabled end to end solution
PEMA Roadmap

NG Plan

• NG9-1-1 Vision - Strategy

Functional Requirements

• NG9-1-1 functional requirements for PSAPs and Regional Networks

ESInet deployment

• Deployed locally, Operated regionally according to state standards
• Integrated technology supports multiple PSAPs
• Based upon NENA I3 standards

GIS / Data ECRF

• Statewide GIS Repository created To serve ECRF function
• ECRF data function created
• Based upon NENA I3 standards

Security

• Security plan Implemented and deployed
• CSRIC and NGSEC Integrated into state plan
• Based upon NENA I3 standards

Telephony

• Enterprise telephony System created within regions
• Shared telephony systems between regions
• Based upon VoIP standards

Applications

• Common NG9-1-1 applications
• Integrated within the Core of the NG solution
• Based upon NENA I3 standards