Virginia Information Technologies Agency

Call Routing in the NG9-1-1 World

VA APCO/NENA/Interop Conference
Roanoke, VA

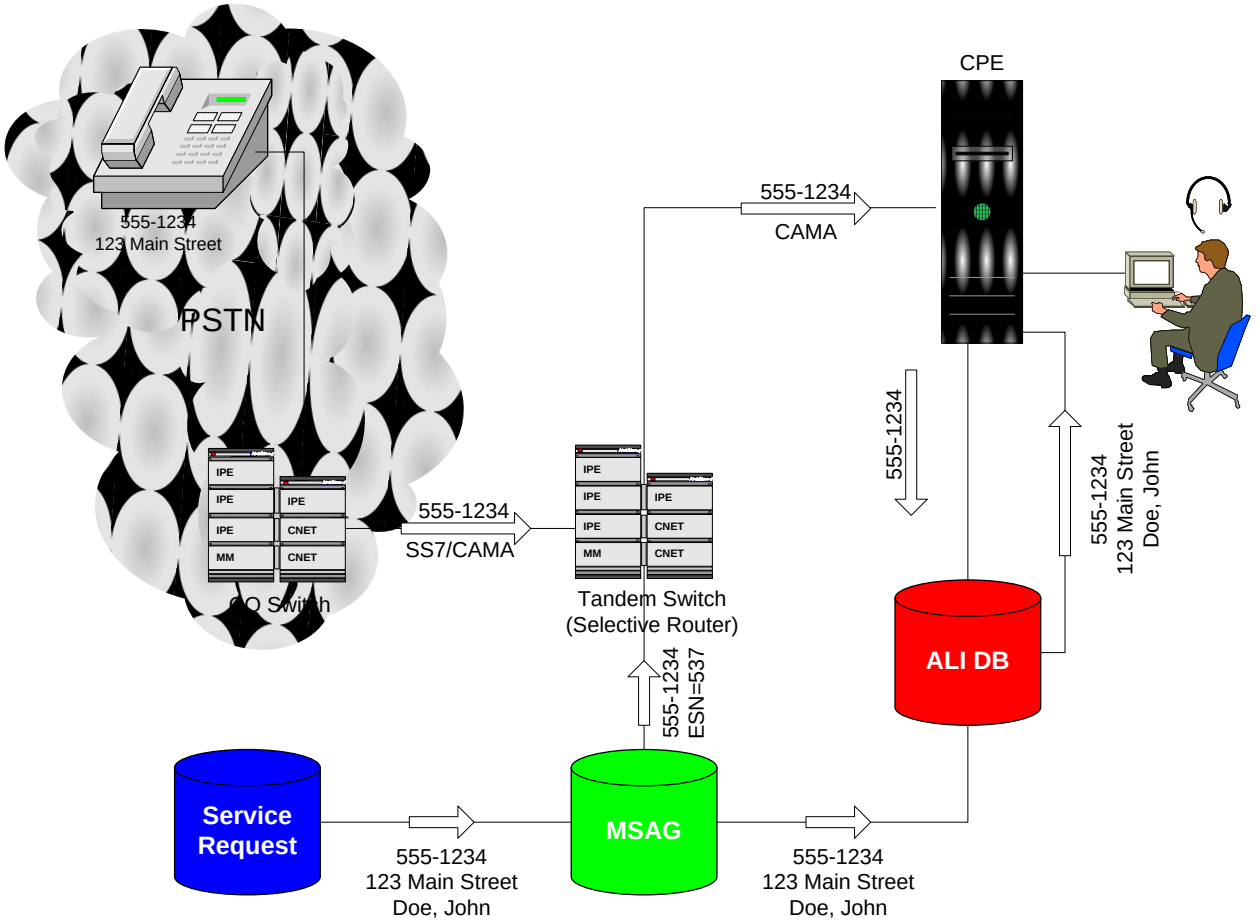
October 30 , 2015

Agenda

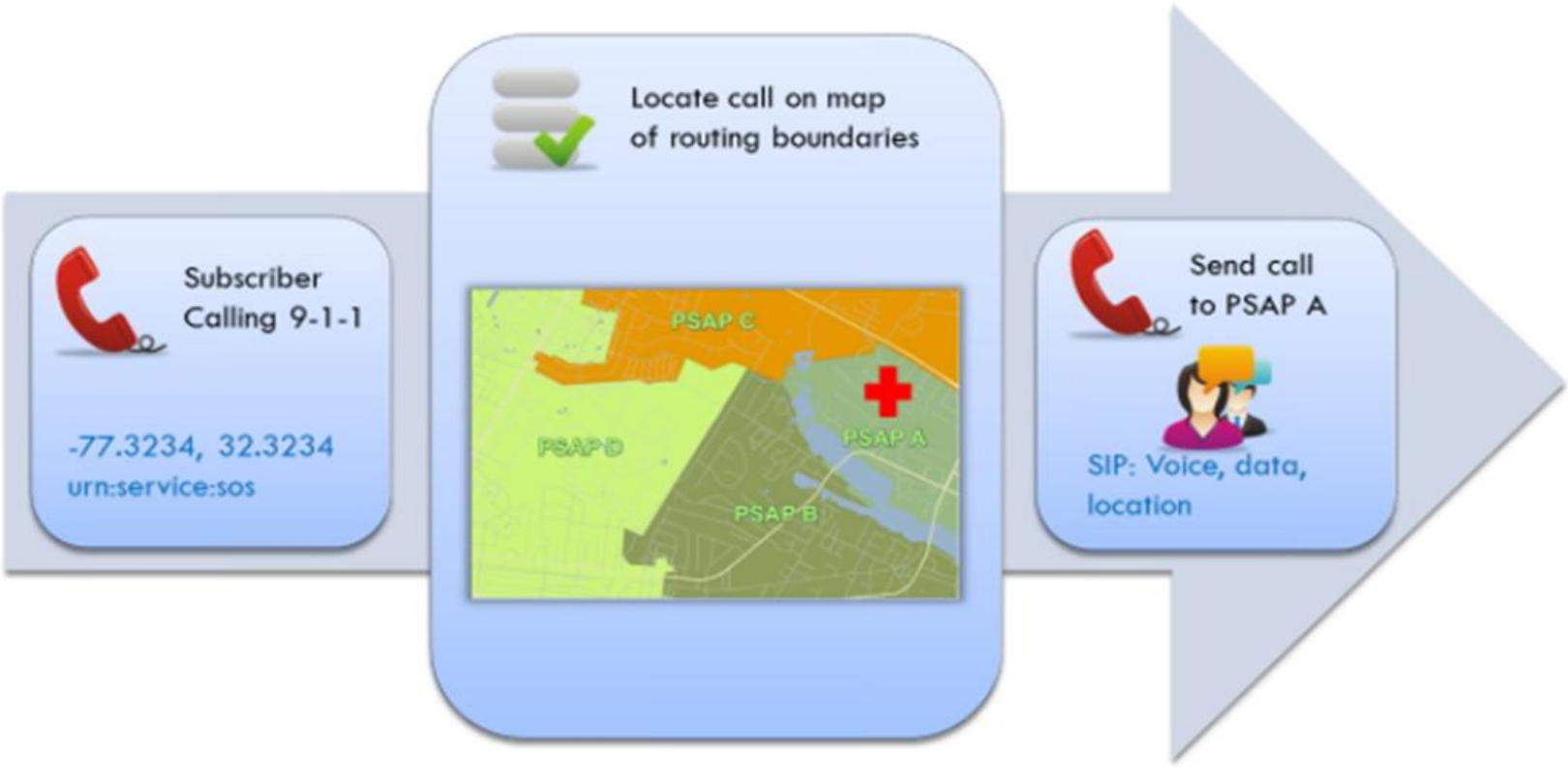
1. What is NG9-1-1?
2. Components of NG9-1-1 Call Routing
3. Role of GIS in NG9-1-1
4. VITA-ISP NG9-1-1 Efforts
5. Wrap-Up/Questions

What is NG9-1-1?

Existing 9-1-1 System



Wireless 9-1-1 Call Routing



* Source: GeoComm

Challenges to Existing 9-1-1 System

- Telecommunications Services
  - Multiple service providers/technologies
  - New technologies/applications continually developed
  - National and global instead of local
  - Increased flexibility/mobility of citizens
- 9-1-1 system
  - Nine, independent networks
  - Extremely limited ability to process data
  - CORE ANALOG TECHOLOGY IS GOING AWAY

What is NG9-1-1?

- NG9-1-1 is the solution to existing challenges
  - Migration from circuit (analog) to packet switched (IP) technology
  - A complete upgrade of the E9-1-1 network to a shared IP network
  - A system of systems serving local, state and national needs
  - Required to meet the demands of new telecommunications technologies

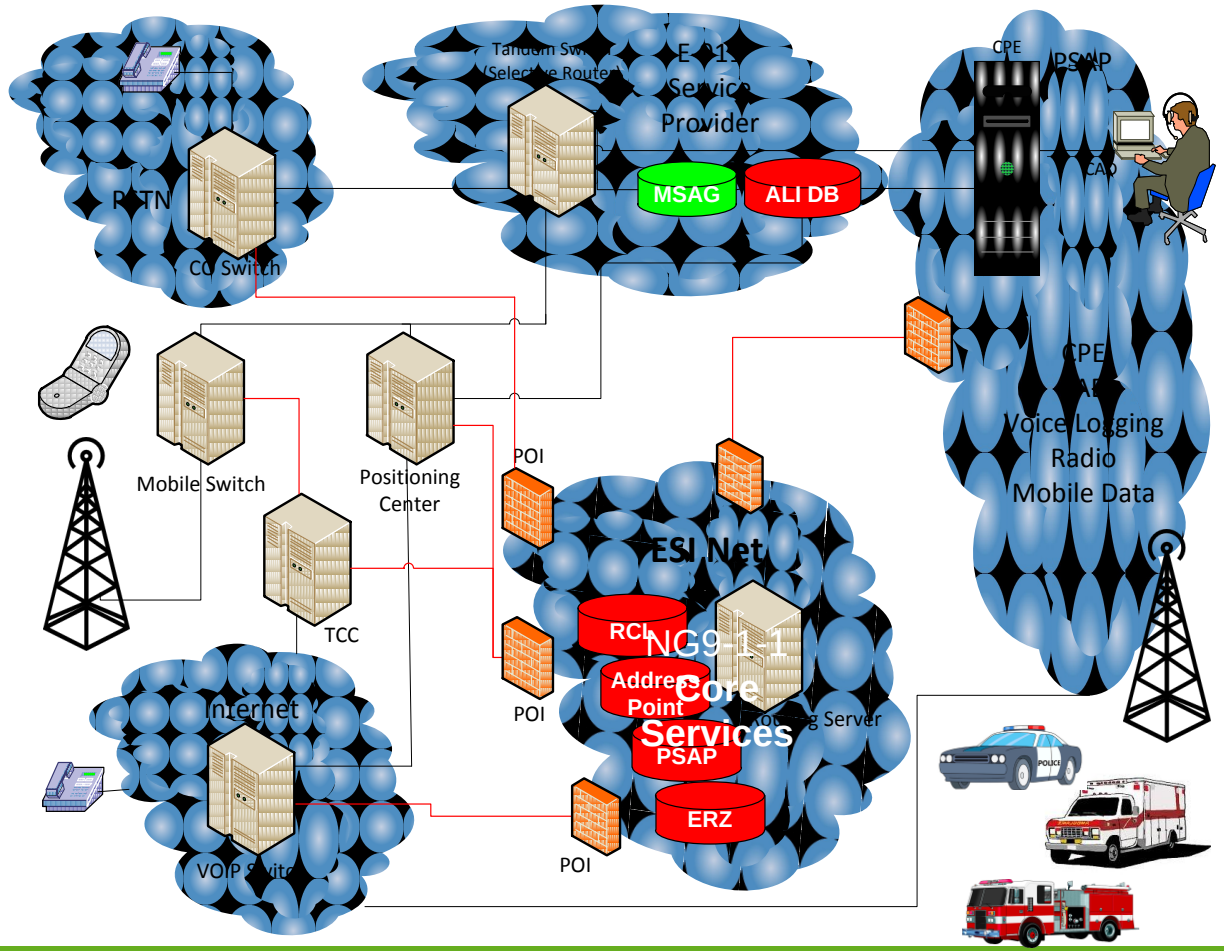
Benefits of NG9-1-1

- Flexibility within the PSAP
- Integration of voice and data
- Increased data available to the PSAP
  - About the caller
  - About the incident
  - About sharing data with other PSAPs and first responders

Problems to be Solved

- Analog/TDM Network going away
- Improve call set up time (8-13 sec.)
- Improved call transferring between PSAPs
- Text-to-9-1-1 implementation
- OTHERS?

9-1-1 Ecosystem



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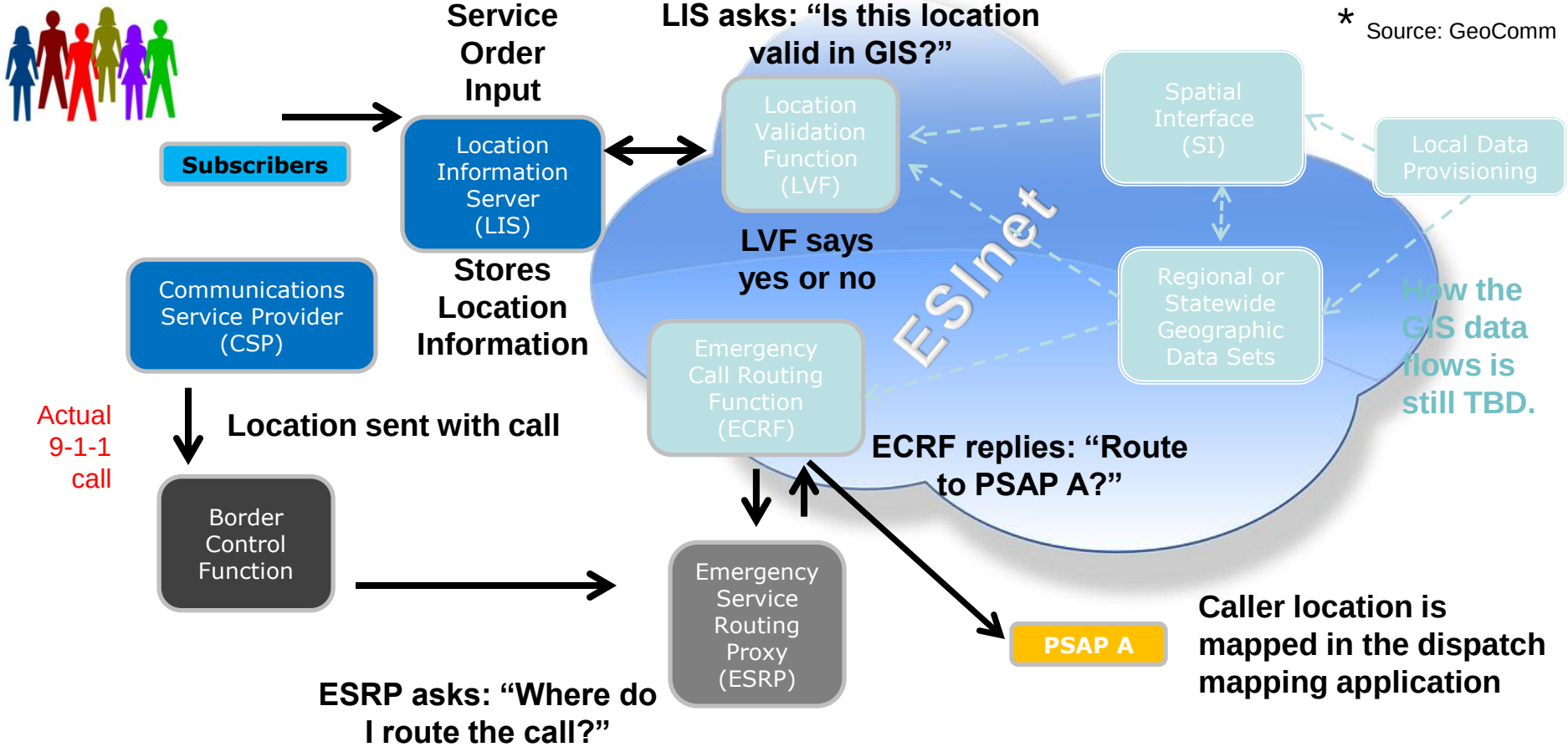
Components of NG9-1-1 Call Routing

How NG9-1-1 Calls Are Routed

- Calls enter through a Border Control Function (BCF)
- Routed through Emergency Services Routing Proxy (ESRP)
- Routing data supplied by Emergency Call Routing Function (ECRF)
- Addresses are pre-validated against the Location Validation Function (LVF)
- Data maintained in Spatial Information Function (SIF)

NG9-1-1 Call Routing



The Big Picture

- NG9-1-1 represents a fundamental change in the way 9-1-1 call for service are handled
- The use of cell phones means we now need to determine the location of a call based on spatial data
- Since the phone system is not "smart", call routing based on tower location
- The ultimate resolution is to make the system "spatially aware"
- That places a bigger burden on local GIS data

Other Requirements

- Diversity
- Redundancy
- Availability
- Security
- Network Management/Monitoring

Other System Interconnections

- Call Handling Equipment (CHE)
- Computer-Aided Dispatch (CAD)
- Mapping Display
- Voice Logging Recorder
- OTHERS?

NENA i3 Standard

- NENA Technical Standard 08-002, *Functional and Interface Standards for Next Generation 9-1-1* (i3)
- NENA Technical Standard 08-003, *Detailed Functional and Interface Specification for the NENA i3 Solution*
- Define Standards for:
  - NG9-1-1 Core Services
  - ESInet
  - PSAP Function

Role of GIS in NG9-1-1

Role of GIS in NG9-1-1

- One of the most time consuming efforts of moving to an NG9-1-1 system will be the preparation of GIS data
  - Used to provide location validation and routing of 9-1-1 calls to the appropriate PSAP
- Synchronization of the MSAG with the GIS centerline and address point data
- MSAG/ALI analysis

How to Prepare for NG9-1-1

What are the necessary data?

Are there existing standards?

Is my data in sync?

EDUCATE YOURSELF

EDUCATE STAKEHOLDERS

Importance of GIS in NG9-1-1

Explain goals and needs

Buy-in & Resource planning

Standards References

- Standards define a common data model and set minimum accuracy goals
  - Http://www.nena.org/standards
    - NENA 71-501 – Synchronizing GIS/MSAG/ALI data (`09)
    - NENA SSAP – in development
    - NENA GIS Data Model – in development
    - NENA ECRF/LVF GIS Provisioning & Maintenance – in development
  - VITA ISP developing standards
    - Administrative boundaries - completed
    - RCL- in development
    - Address points and service areas – coming soon

One of the First Steps

- Complete a data analysis

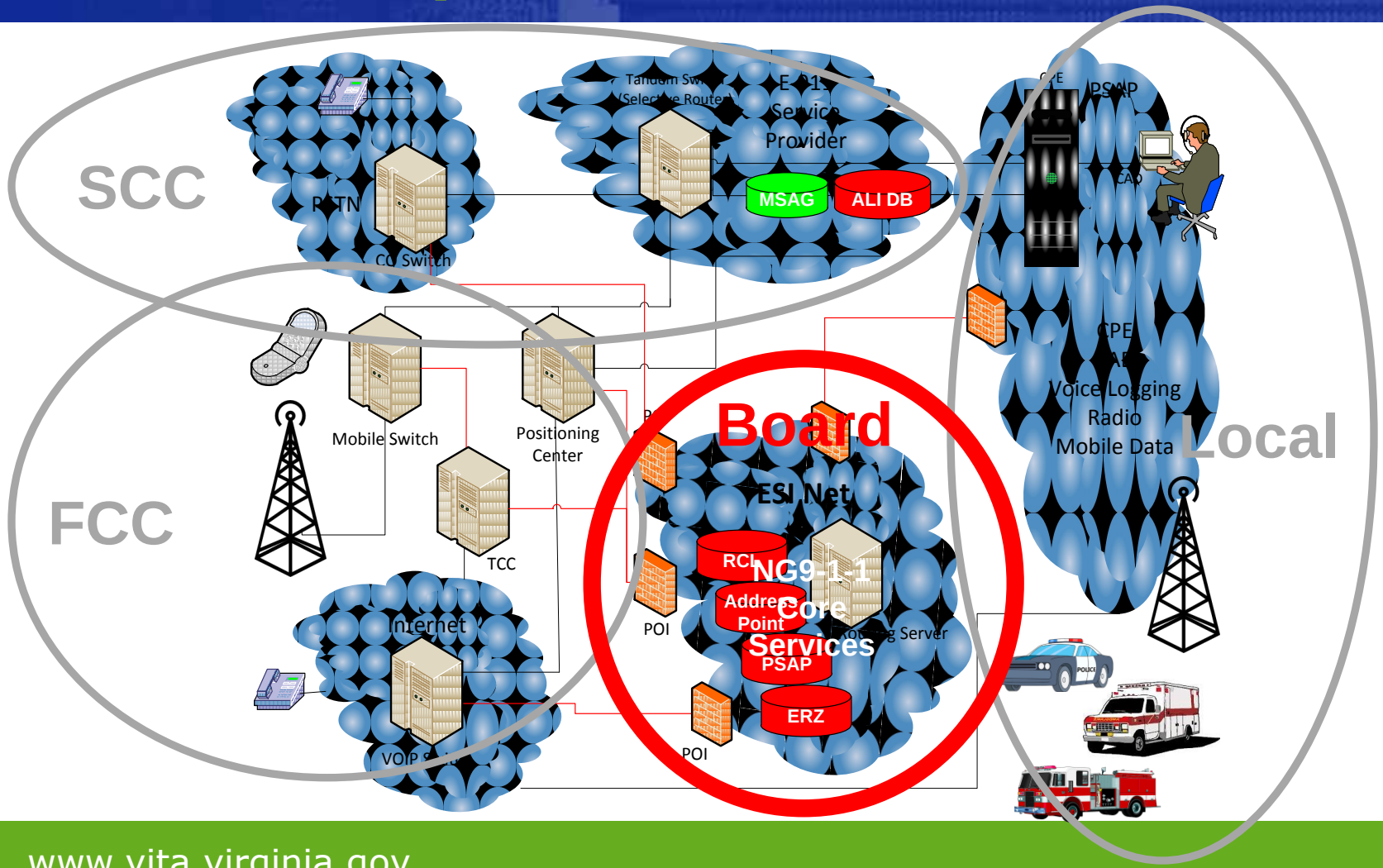
> "It is recommended that a minimum match rate of **98%** be set prior to using the GIS data in the Emergency Routing Data Base (ERDB) or the Location to Service Translation (LoST) Protocol services."
>
> - *NENA Information Document for Synchronizing Geographic Information System databases with MSAG & ALI NENA 71-501, Version 1.1, September 8, 2009*

ECRF and **LVF** functional elements of a NG9-1-1 system are both LoST protocol servers.

We can help!

VITA-ISP NG9-1-1 Efforts

9-1-1 Ecosystem



ESI Net Options

Total Local Control
State Grant Program

Total State Control
Local Board Members

ES Net Options

Range of
Likely Results

Total Local Control
State Grant Program

Total State Control
Local Board Members

Role of the E-911 Services Board

- Define Standards for:
  - NG9-1-1 Core Services
  - ESInet
  - PSAP Function

  } NENA I3 Standard

  - Processing of information through the ESInet
  - Ensuring the Commonwealth can operate as a single network and interoperate with other states
- Assist localities with best practices for those things in Local control

E-911 Service Board Path Forward

- Develop statewide requirements for the ESInet and develop solicitation for such service defining costs
- Encourage compliance with standards through available grant funding
- Develop GIS data standards to support NG9-1-1
- Explore funding models for sustainment of 9-1-1 with interested stakeholders

Guiding Principles

- 9-1-1 is an essential, local/regional service
- Need to address ALL of 9-1-1 not just NG
- Full stakeholder engagement is needed
- Services must be not be degraded
- Economies need to be leveraged
- Doing nothing is NOT an option

Conclusions

- This is an evolving process. All of the questions haven't been asked and all of the answers haven't been developed.

- Keep
  - Learning
  - Asking
  - Listening
  - Preparing
  - INVOLVED