Emergency Numbers Systems Board

Overview of Legacy E911

Overview of "Next Gen" E911

ENSB Cybersecurity Committee

Emergency Numbers System Board

- Formed in 1979, 17 Member board

- Coordinates installation and enhancement of county 9-1-1 emergency telephone number services systems.

- The board issues guidelines and determines review procedures to approve or disapprove county plans for these systems

- Provides for audit of Trust Fund accounts; and sets criteria for reimbursing counties.

- Recently passed "Carl Hen's Law" which will add additional requirements

    - "requiring the Board, in consultation with the Maryland Cybersecurity Council, to establish certain cybersecurity standards for public safety answering points; requiring the director of each public safety answering point to examine the cybersecurity of the public safety answering point under certain circumstances and to submit to the Board a certain report"

Legacy E-911 system

- All analog 911 trunks, currently provided by Verizon in all counties
- System has redundancy but is limited
  - Each county has trunks from 2 different central office
  - Most counties have a backup center in their county
  - Each county can transfer calls to 1 other county using older technology call routing.
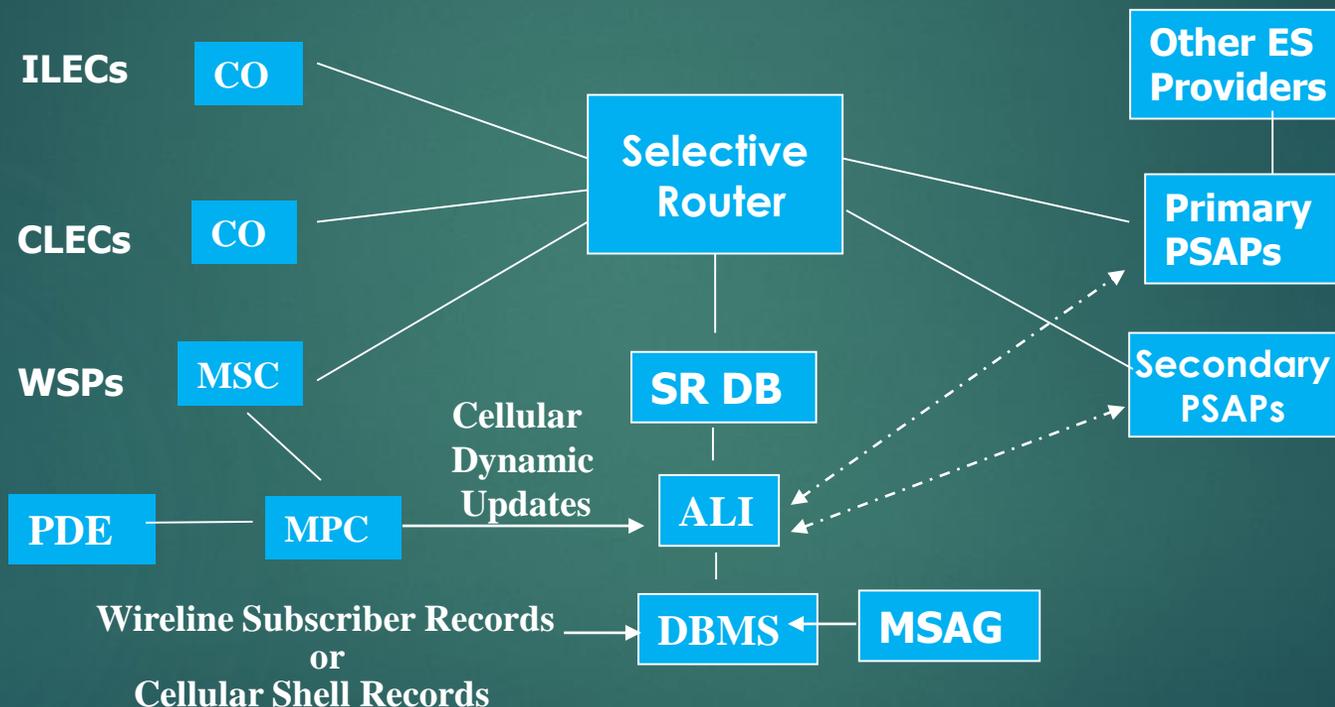
Add Cellular E9-1-1 Components

Originating Calls

Emergency Service Providers

MSC – Mobile Switching Center

PDE/MDC - Positioning equipment

SRDB – Selective Router DBMS – Database Mgmt System

ILECs — CO

CLECs — CO

WSPs — MSC

PDE — MPC

Selective Router

SR DB

Cellular Dynamic Updates

ALI

DBMS ← MSAG

Wireline Subscriber Records
or
Cellular Shell Records

Other ES Providers

Primary PSAPs

Secondary PSAPs

Difficult and costly to integrate new call or messaging sources, and the corresponding data needs.
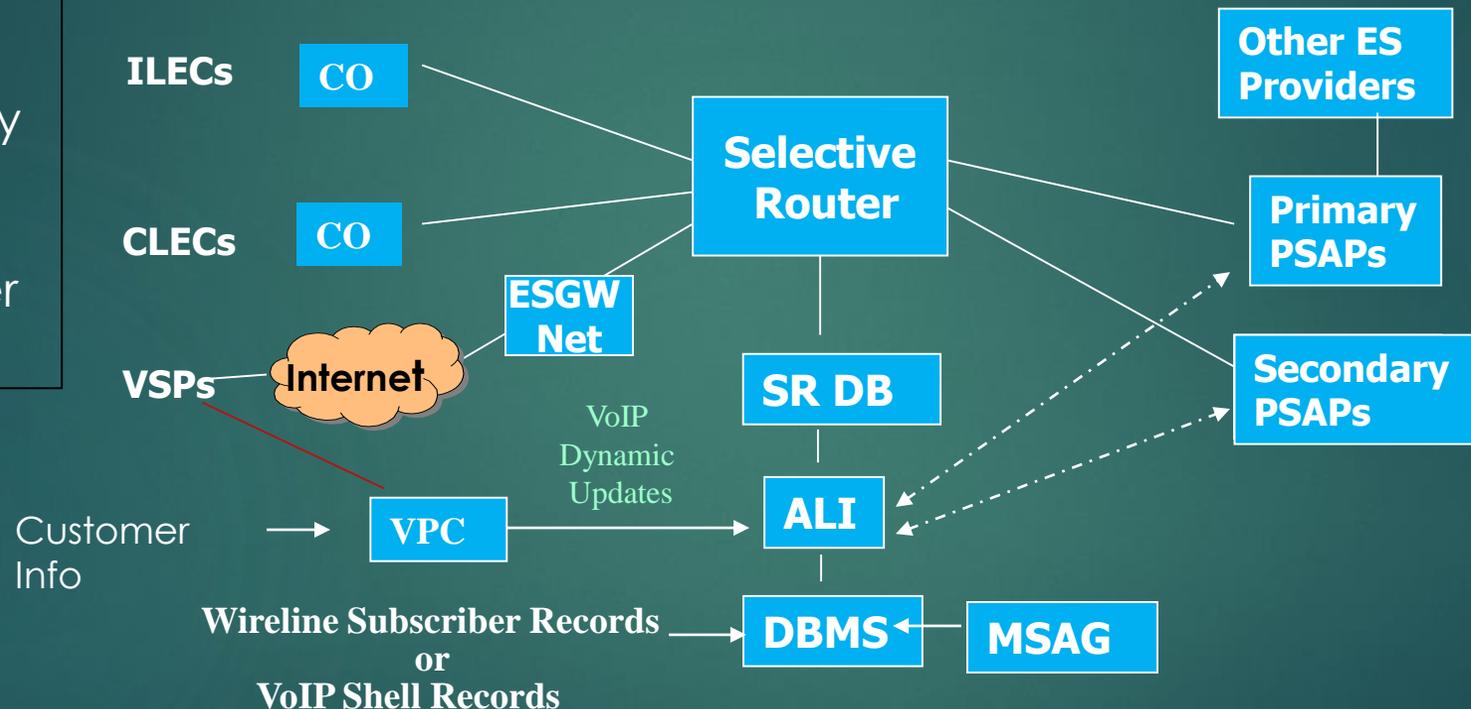
Adapt for VOIP - E9-1-1 Components

Originating Calls

Emergency Service Providers

ESGW – Emergency Services Gateway

VPC – VoIP positioning center - (routing of Call)

ILECs — CO

CLECs — CO

ESGW Net

VSPs — Internet

Customer Info → VPC

VoIP Dynamic Updates

Selective Router

Other ES Providers

Primary PSAPs

SR DB

Secondary PSAPs

ALI

Wireline Subscriber Records
or
VoIP Shell Records → DBMS ← MSAG

Difficult and costly to integrate new call or messaging sources, and the corresponding data needs.

E9-1-1   vs   NG9-1-1

E9-1-1	NG9-1-1
▶ Complex analog trunking and data network	▶ Engineered, managed IP networks (ESInet)
▶ Class 5 switch for Selective Router	▶ IP software selective routing function
▶ Translation based control	▶ GIS and database controls
▶ Limited to voice calls	▶ Voice, text, video
▶ Data bandwidth 20 char (digits)	▶ Bandwidth unlimited
▶ Complex Emergency Gateway Network for VoIP	▶ Direct handling of Internet sourced calls
▶ Custom interfaces for each service type	▶ Standard IP interface for all service types

NENA
THE
9·1·1
ASSOCIATION

What's Driving NG9-1-1?

- Newer technologies/services

    - Text, image, video, telematics, sensors, subscriber info, emergency location info

- Need to "mainstream" 9-1-1 technology

- Improve survivability

    - Network resilience, virtual PSAPs

- Improve interoperability and information sharing

How NG9-1-1 is Different

- Technology

  - IP Packet Based vs Circuit Switched

- Interoperability

  - No longer a "local" service

  - Interoperates at county, region, state and national levels

How NG9-1-1 is Different (cont'd)

- Functionality

  - Replicates E9-1-1 capabilities

    and

  - Adds new capabilities, direct control options

  - Wide ranging additional data options

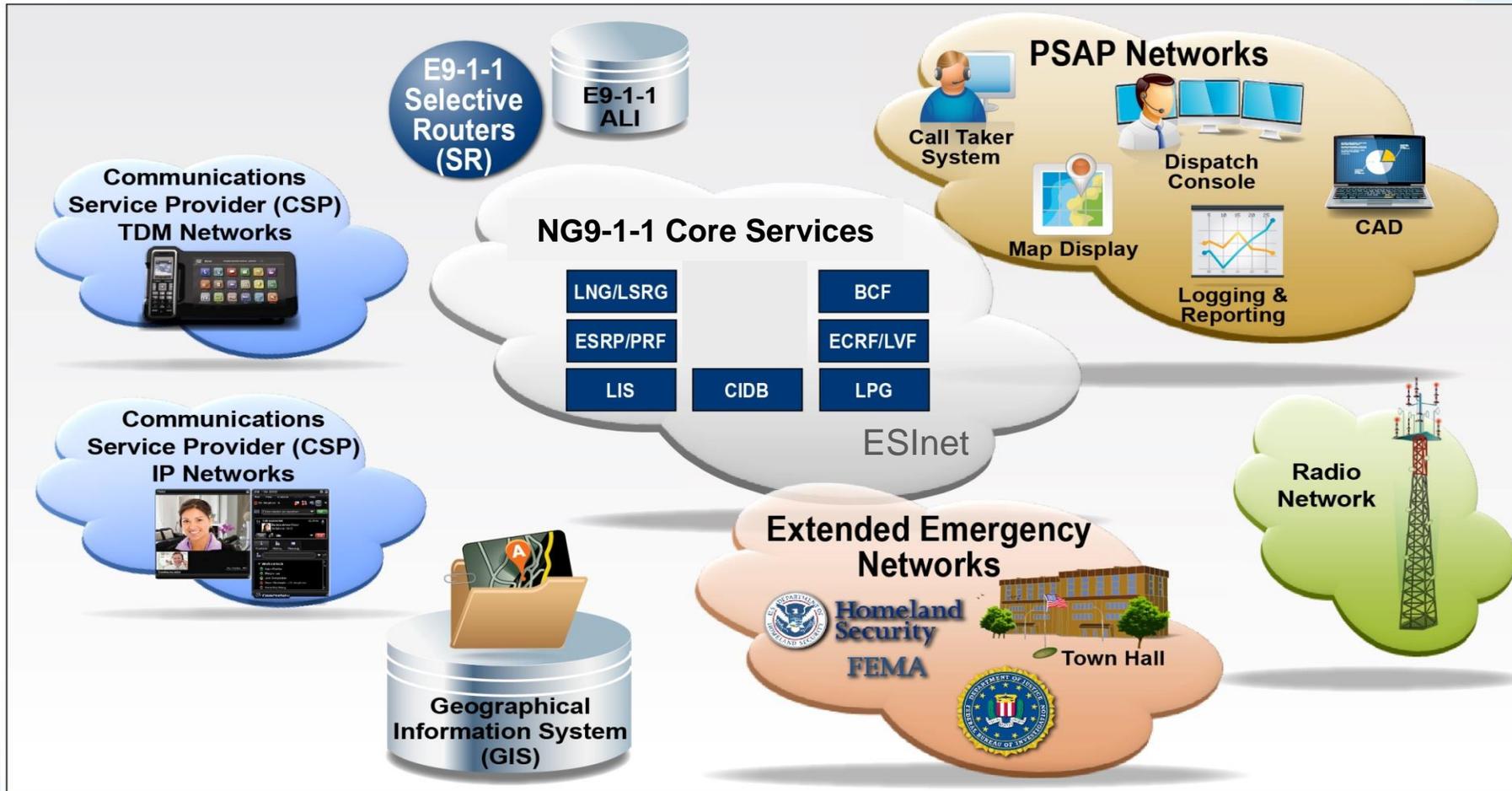 - GIS-based instead of tabular data for location validation and routing control

How NG9-1-1 is Different (cont'd)

- IP SIP based   (all call handling is SIP based)

  - Uses numerous IETF RTFs, such as ECRIT, INVITE, REFER, BYE, PIDF-LO

  Example functional areas:

  - Location Validation Function (GIS based)
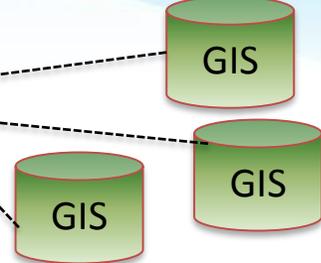
  - SIP ingress and call routing control (ESRP with ECRF)

  - SIP delivery of call and data   (multimedia supported)

  - Queries for wide range of added data
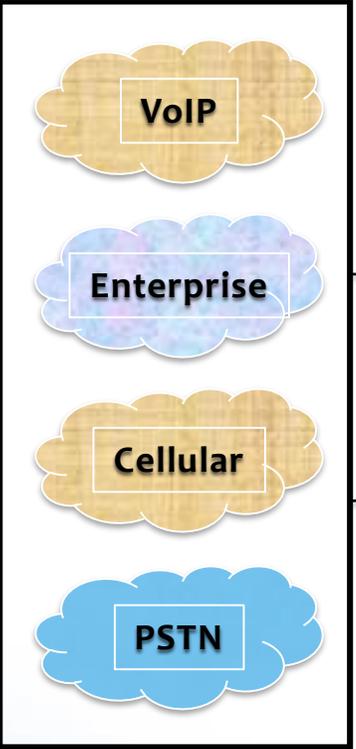
NG9-1-1 Ecosystem

Next Generation 9-1-1
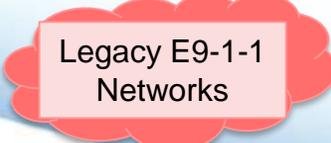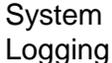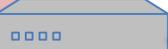
This diagram is simplified for illustrative purposes.

The Nature of NG9-1-1

- Designed to support interoperability

- Designed with open standards

- Designed for and enables open competition

- Enables a transition to competitive service provider environment

- Necessitates regulatory (and legislative) change

NG9-1-1 Common Benefits

PSAPs and Responders

- Text/IM to 9-1-1

- Files to 9-1-1 , such as photos or video clips

- Streaming video

- Telematics and sensor data

- Additional Data available

NG9-1-1 PSAP Benefits

- Virtual PSAP (geographically distributed)
  - NG9-1-1 controlled to individual or hosted CPE
- Nomadic and/or mobile call taker workstations
- Policy-based alternate routing with new options
  - To alt PSAP, or spreading calls to multiple PSAPs
  - Invoked directly within minutes by PSAPs (online)
- Additional Policy-based routing for:
  - Language preference of caller
  - Type of technology >IM, Sensor, Satellite phone

NG9-1-1 Responder Benefits

- Informative data to dispatch and field responders

- National standards for data interfaces

- Adaptable for future needs

- Text/IM via 9-1-1

ENSB Cybersecurity Subcommittee

Senate Bill 339: *Public Safety – 9-1-1 Emergency Telephone System (Carl Henn's Law)*

This bill enhances and alters the regulatory framework that governs the State's 9-1-1 system.

- Cybersecurity Standards (minimum standards)
  - Cybersecurity, oversight and accountability of service level agreements between counties and NG service providers
  - In consultation with the Maryland Cybersecurity Council
  - National industry and 9-1-1 system trade association best practices
  - Response protocols for an attack
  - PSAP director to certify the PSAP meets Board standards and a report detailing the exercise leading to the certification prior to PSAP receiving any Board funding

Cybersecurity and Investigations

Cybersecurity

- Identify minimum standards for cybersecurity, oversight, and accountability of service level agreements between counties and core service providers of NG911 services

- Recommend a COOP template including cybersecurity risk mitigation strategy and annual evaluation/practice

- Identify suggested requirements for local agency compliance, based on industry standards and best practices surrounding NG911 technology and cybersecurity protection and prevention

Investigations (Ad Hoc)

- As needed to investigate network or PSAP-affecting events to provide after action reporting to the board