Exchange of Health Information Between Public Health and Clinical Care

The vision, challenges and benefits

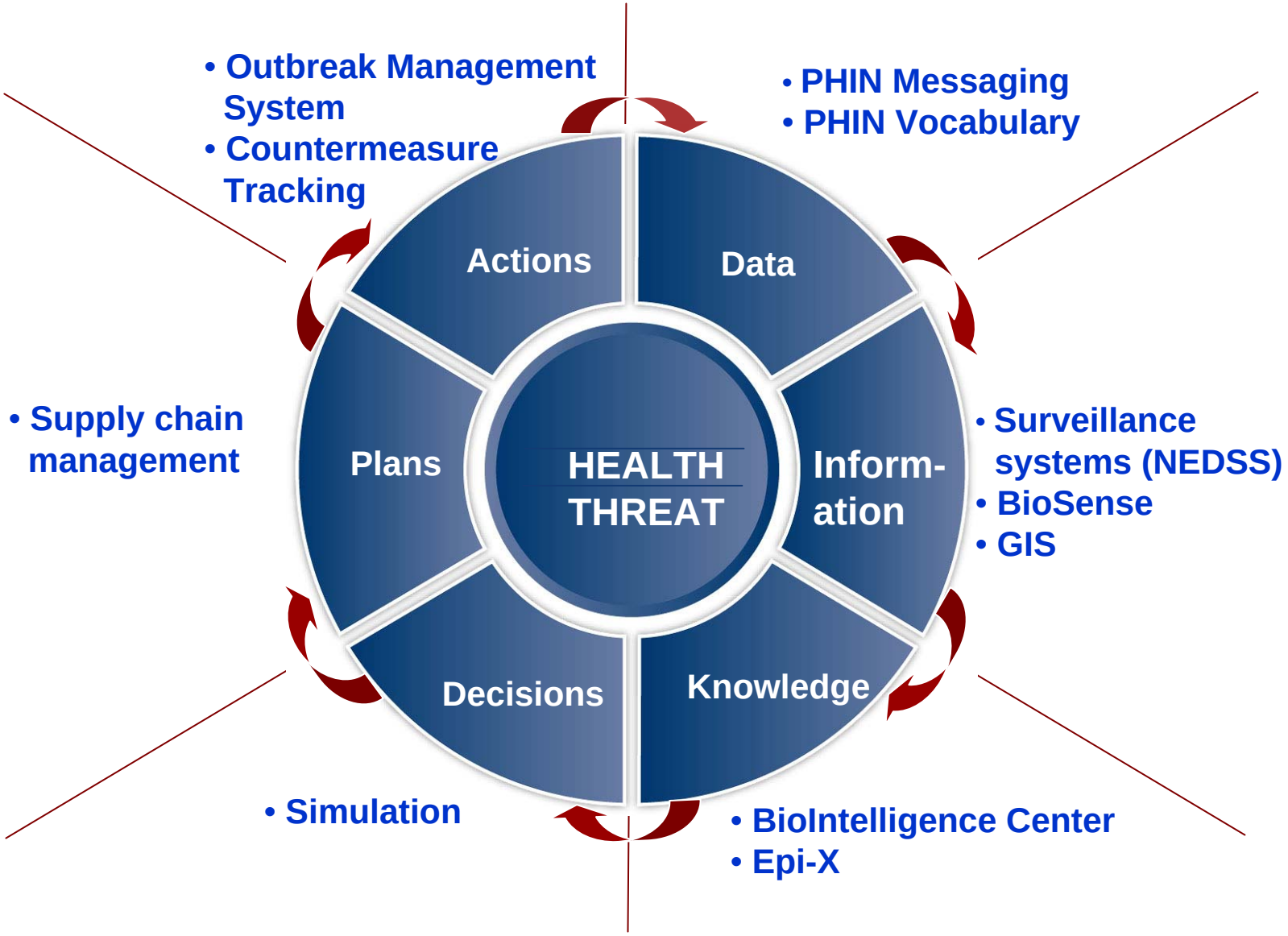
Dr. Leslie Lenert, Director, National Center for Public Health Informatics

National Center for Public Health Informatics

MISSION

“Protecting public’s health, promoting health equity, and transforming the health system through advancement of the science of biomedical informatics as it applies to public health practice.”

Model Formulation: Health Protection Framework



Health Protection Framework Foundation

EDUCATION

POLICY

EVALUATION

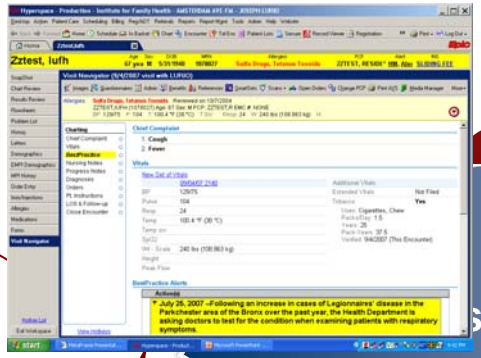
RESEARCH

APPLICATIONS & SERVICES

STANDARDS

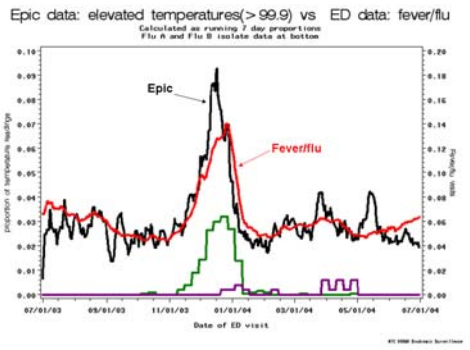
Integrated Systems of Systems

Practice Alert in EHR prompts changes in physicians' behaviors



Index case of Legionella reported

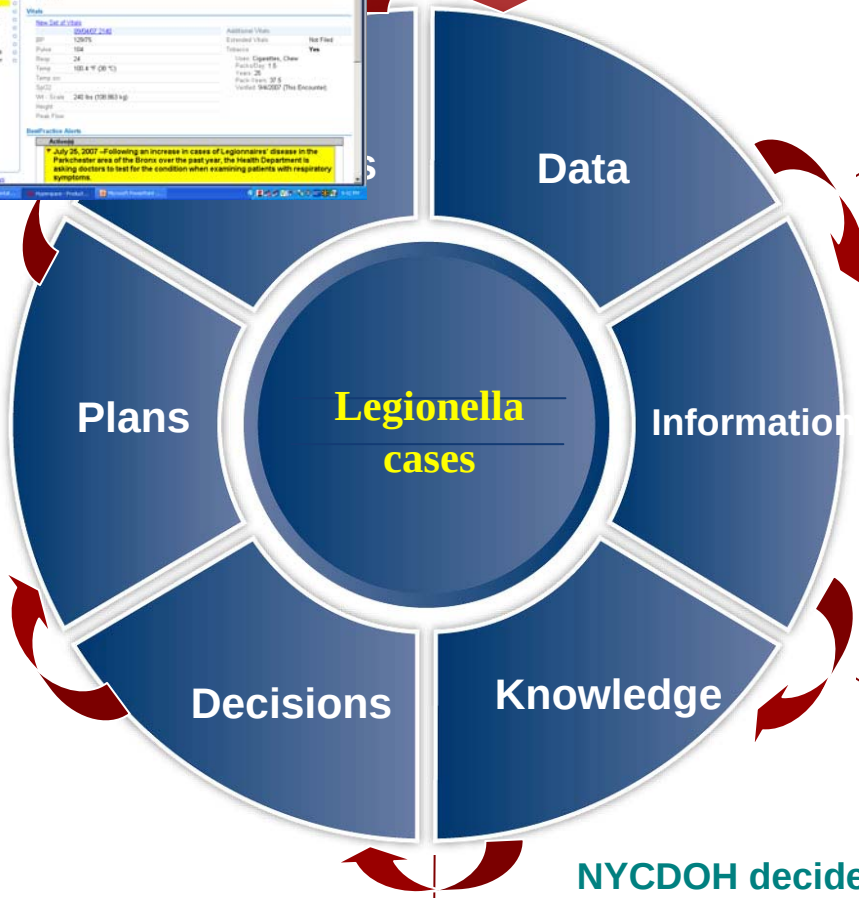
Surveillance system @ NYC Department of Health detect cases of Legionella in Parkchester community in Bronx



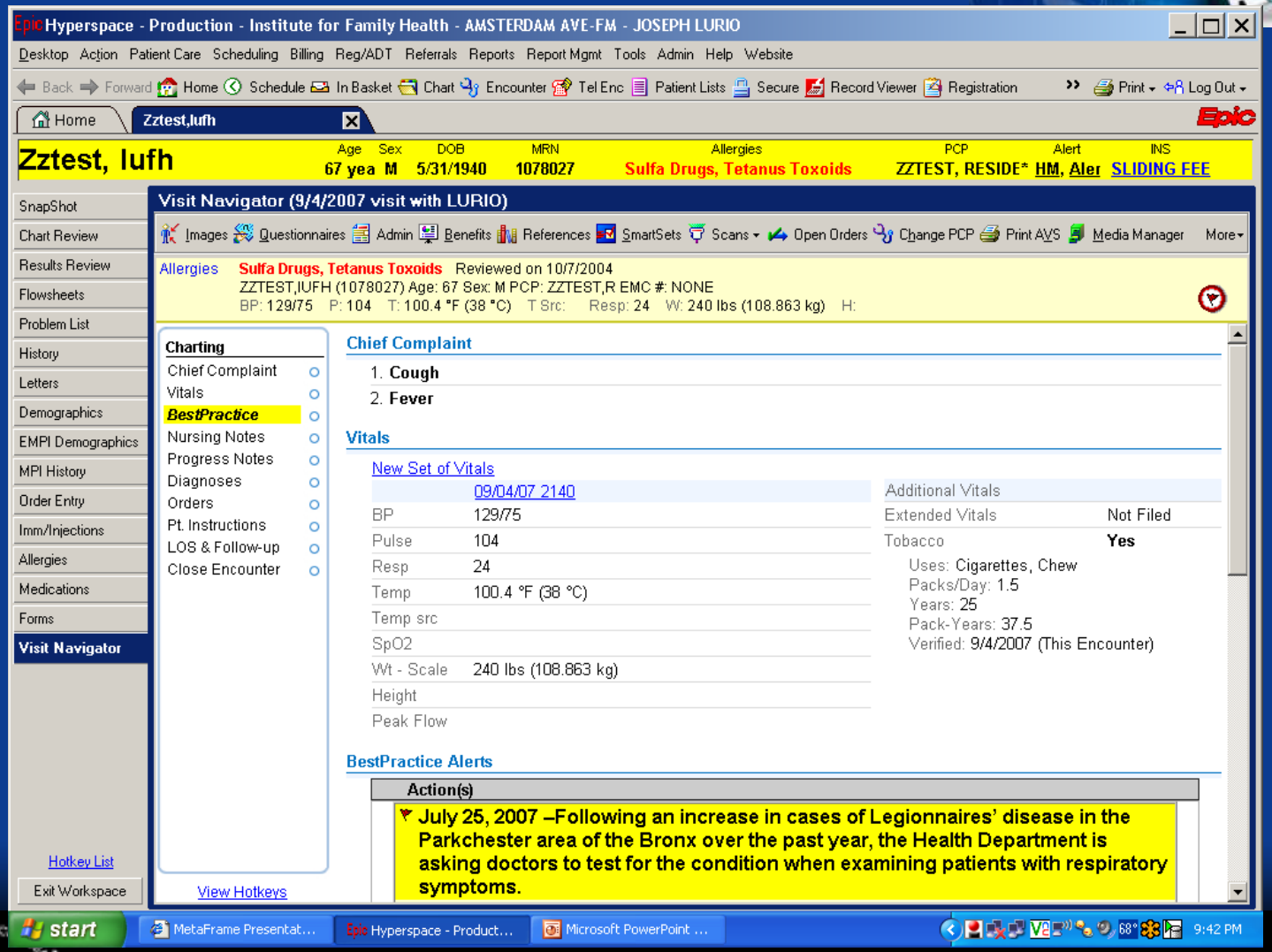
NYCDOH decides there is a Legionella Outbreak

NYCDOH issues alert on Legionella Outbreak

Alert is embedded into Electronic Health Records (EHR)

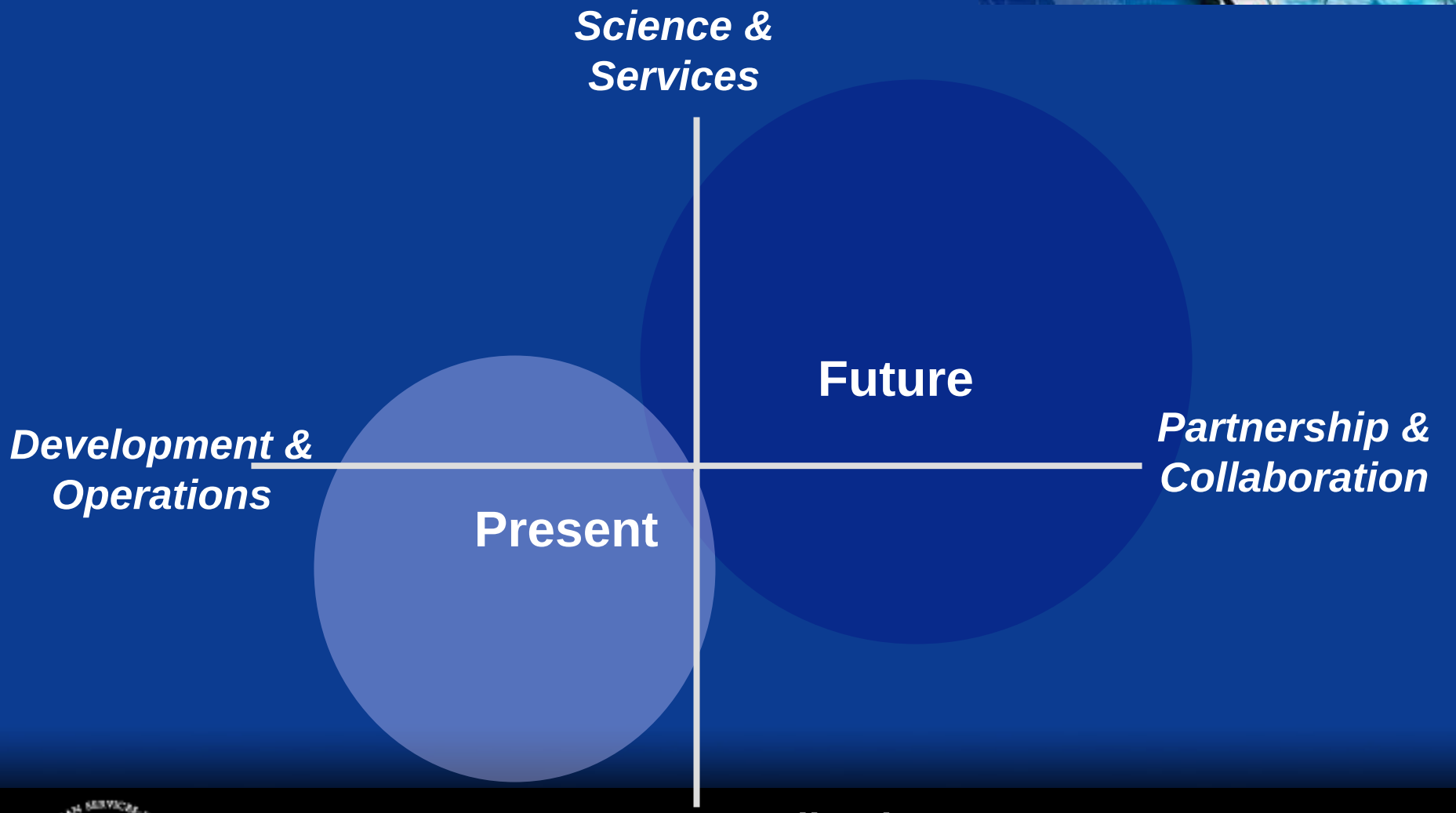


Action: Influencing Health Provider Behavior



SAFER • HEALTHIER • PEOPLE™

Moving Forward



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CDC™

BioSense and NEDSS

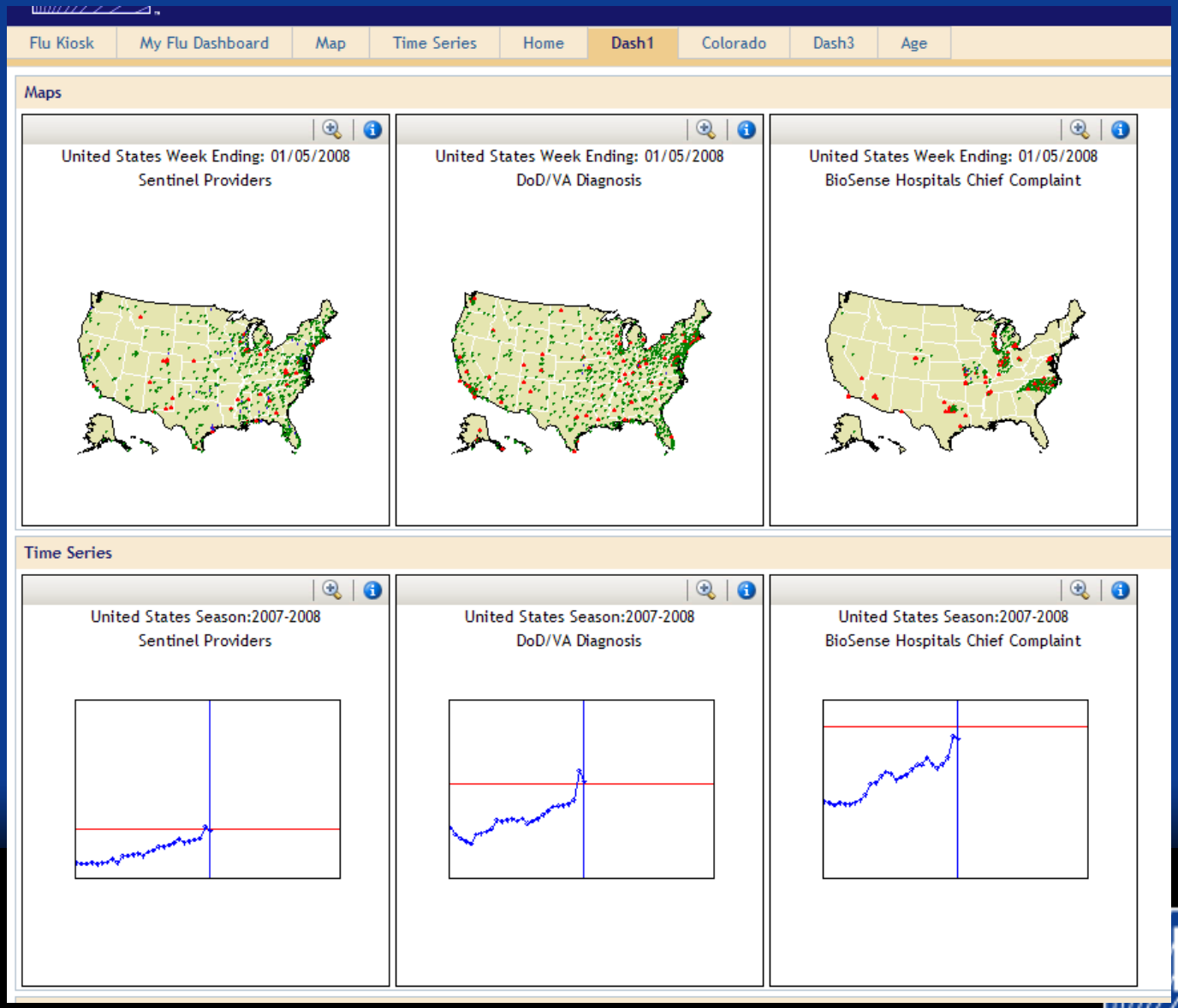
- BioSense is a national program intended to improve the nation's capabilities for conducting near real-time biosurveillance, enabling health situational awareness through access to existing data from healthcare organizations across the country.
- NEDSS (National Electronic Disease Surveillance System) is an Internet-based infrastructure for public health surveillance data exchange that uses specific Data Standards for notifiable disease reporting.

The richness of data from the BioSense feed includes laboratory test results, which may be required for notifiable reporting in a health jurisdiction

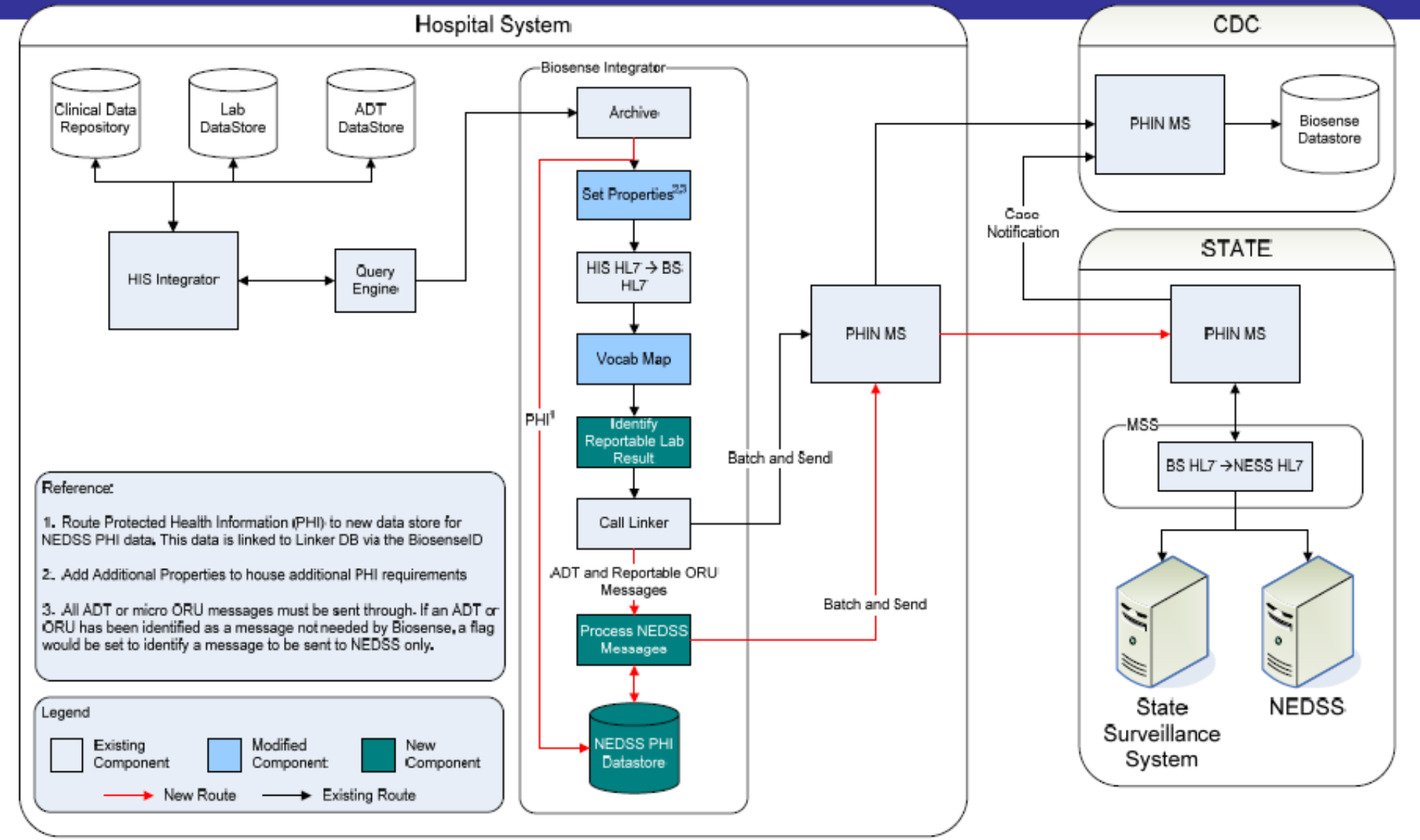
Unique capabilities of BioSense

- Interoperability
- Capacity for secure large scale data management
- Custom tailoring of queries
- Integrated electronic laboratory reporting
- Individual level identifier
- Regional Health Information Exchange Testbed

Biosense Influenza Tool Merges Multiple Sources



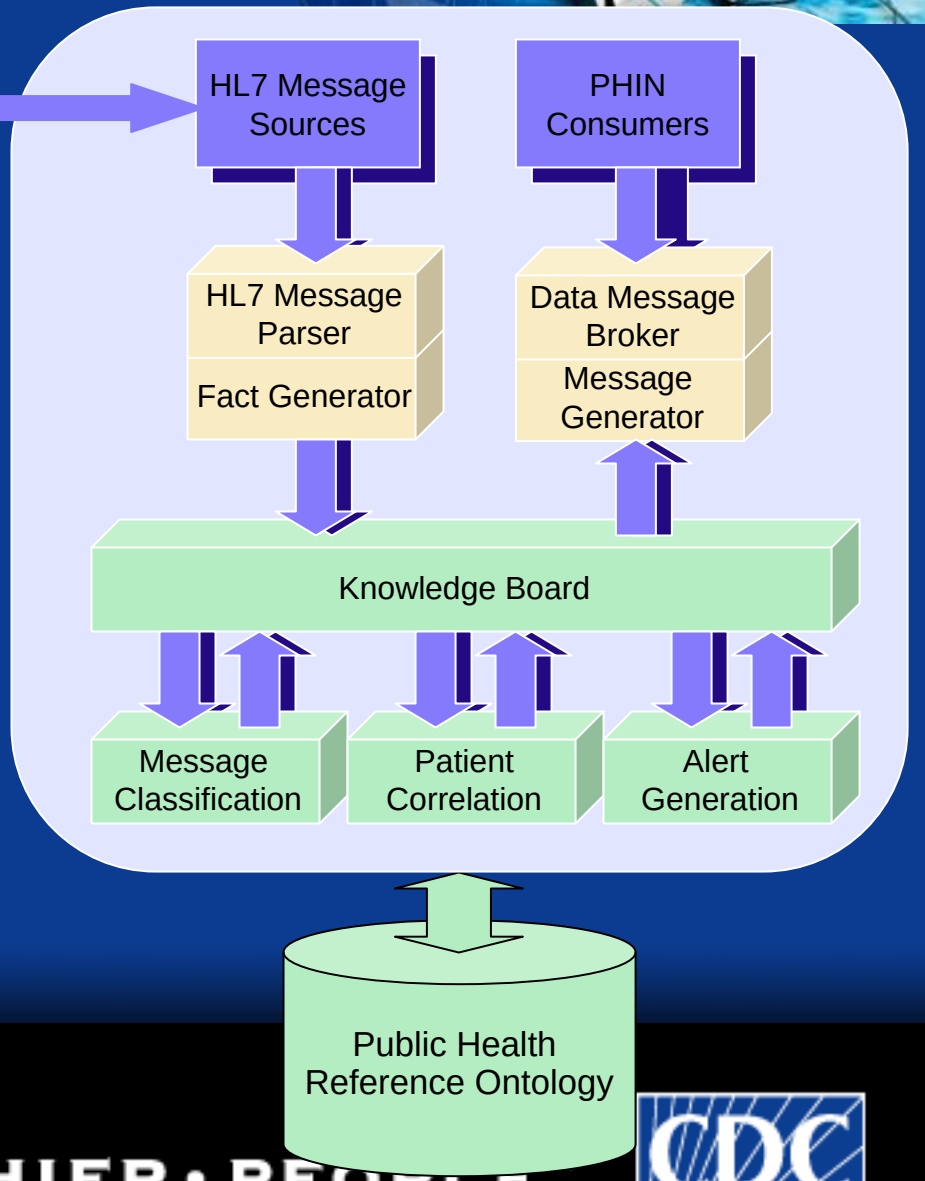
Combining BioSense and NEDSS

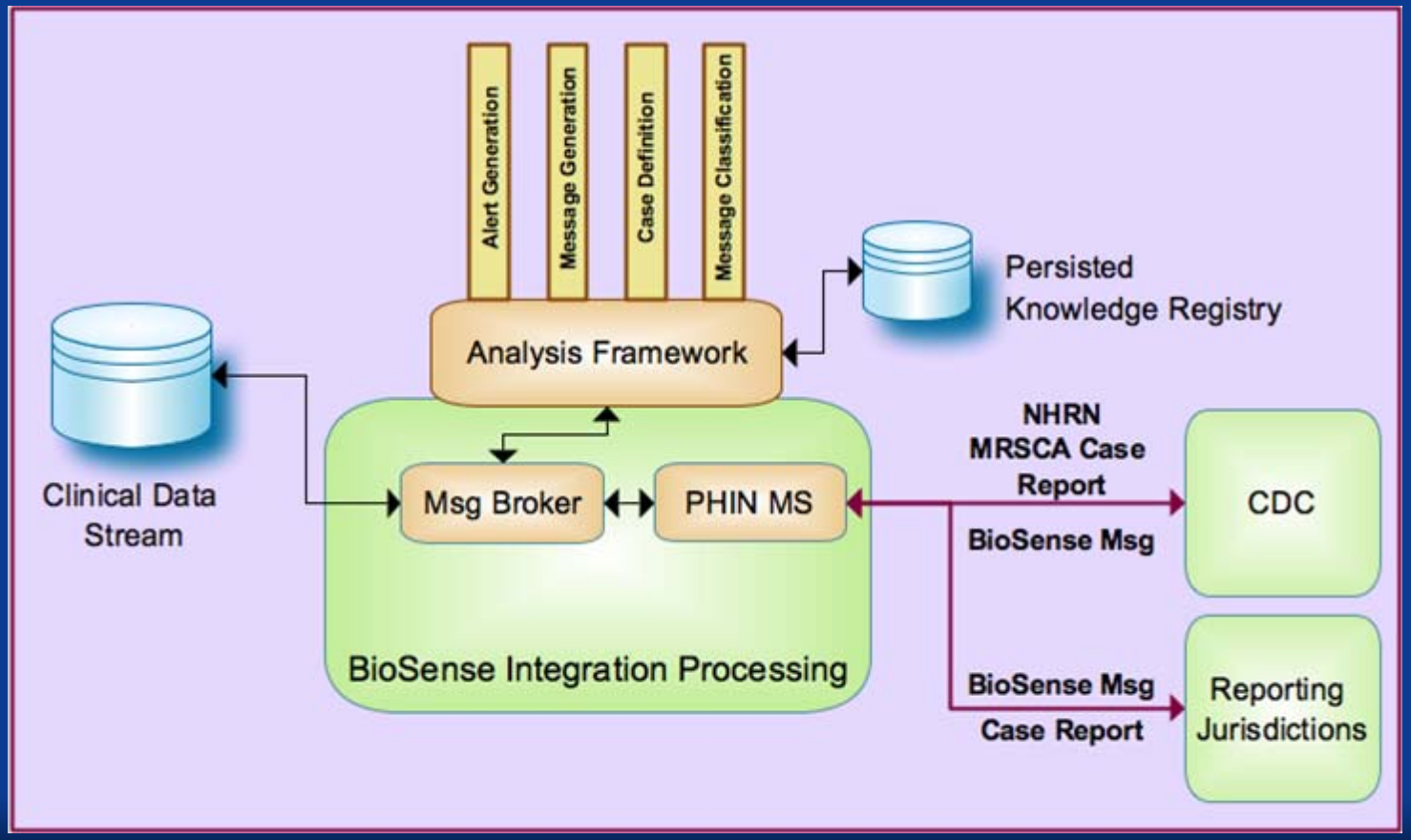


BioSense Case Recognition

HL7 2.5 Source Message

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<!-- edited with XMLSpy v2007 sp2 (http://www.altova.com) by Ce
- <ORU_R01>
 + <MSH>
 - <ORU_R01.PATIENT_RESULT>
  + <ORU_R01.PATIENT>
  - <ORU_R01.ORDER_OBSERVATION>
   - <OBR>
      <OBR.1>1</OBR.1>
     + <OBR.2>
     + <OBR.3>
     - <OBR.4>
        <CE.4>CSF protein</CE.4>
        <CE.5>CSF protein</CE.5>
       </OBR.4>
     + <OBR.7>
     + <OBR.8>
     + <OBR.14>
     - <OBR.15>
       - <SPS.1>
          <CWE.4>Spinal Fluid</CWE.4>
         </SPS.1>
       </OBR.15>
     + <OBR.22>
       <OBR.24>LA</OBR.24>
       <OBR.25>F</OBR.25>
      </OBR>
   - <ORU_R01.OBSERVATION>
     - <OBX>
        <OBX.1>1</OBX.1>
        <OBX.2>NM</OBX.2>
       - <OBX.3>
          <CE.1 />
          <CE.2>CSF protein conc</CE.2>
          <CE.5>CSF protein mg%</CE.5>
         </OBX.3>
        <OBX.4>34</OBX.4>
       - <OBX.5>
          <NM.1>34</NM.1>
         </OBX.5>
       - <OBX.6>
          <CE.1>mg/dL</CE.1>
         </OBX.6>
```




Alert Generation
Message Generation
Case Definition
Message Classification
Analysis Framework
Persisted
Knowledge Registry
Clinical Data
Stream
Msg Broker
PHIN MS
NHRN
MRSCA Case
Report
BioSense Msg
CDC
BioSense Integration Processing
BioSense Msg
Case Report
Reporting
Jurisdictions

Moving Forward

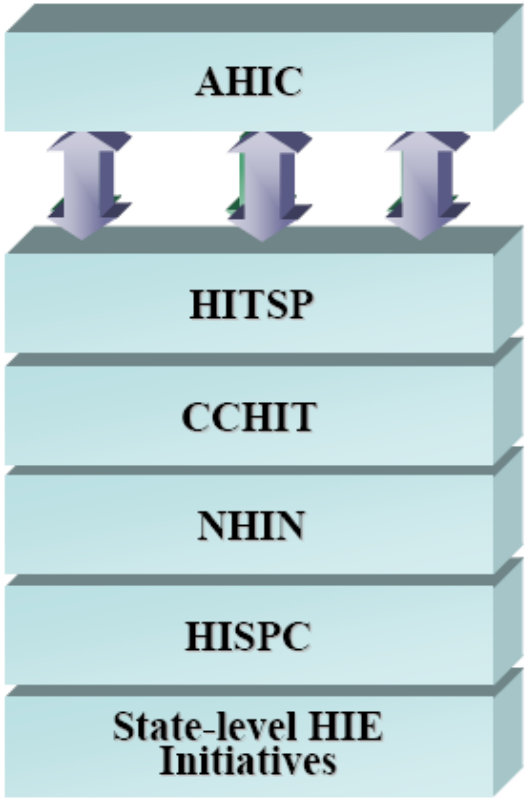
- Public health integration into the NHIN
- Communities of practice
- Open source initiative
- Centers of Excellence
- Workforce training in informatics
- Service Oriented Architecture for the CDC
  - Vocabulary, GIS, simulation, etc.

NCPHI and the NHIN

- President's Mandate - 2004
  - By 2014 - Widespread Electronic Health Records (EHRs)
- Office of the National Coordinator for Health Information Technology (ONC)
- American Health Information Community (AHIC)
  - Healthcare IT Standards Panel (HITSP)
  - Certification Commission for Healthcare Information Technology (CCHIT)
  - NHIN Prototypes

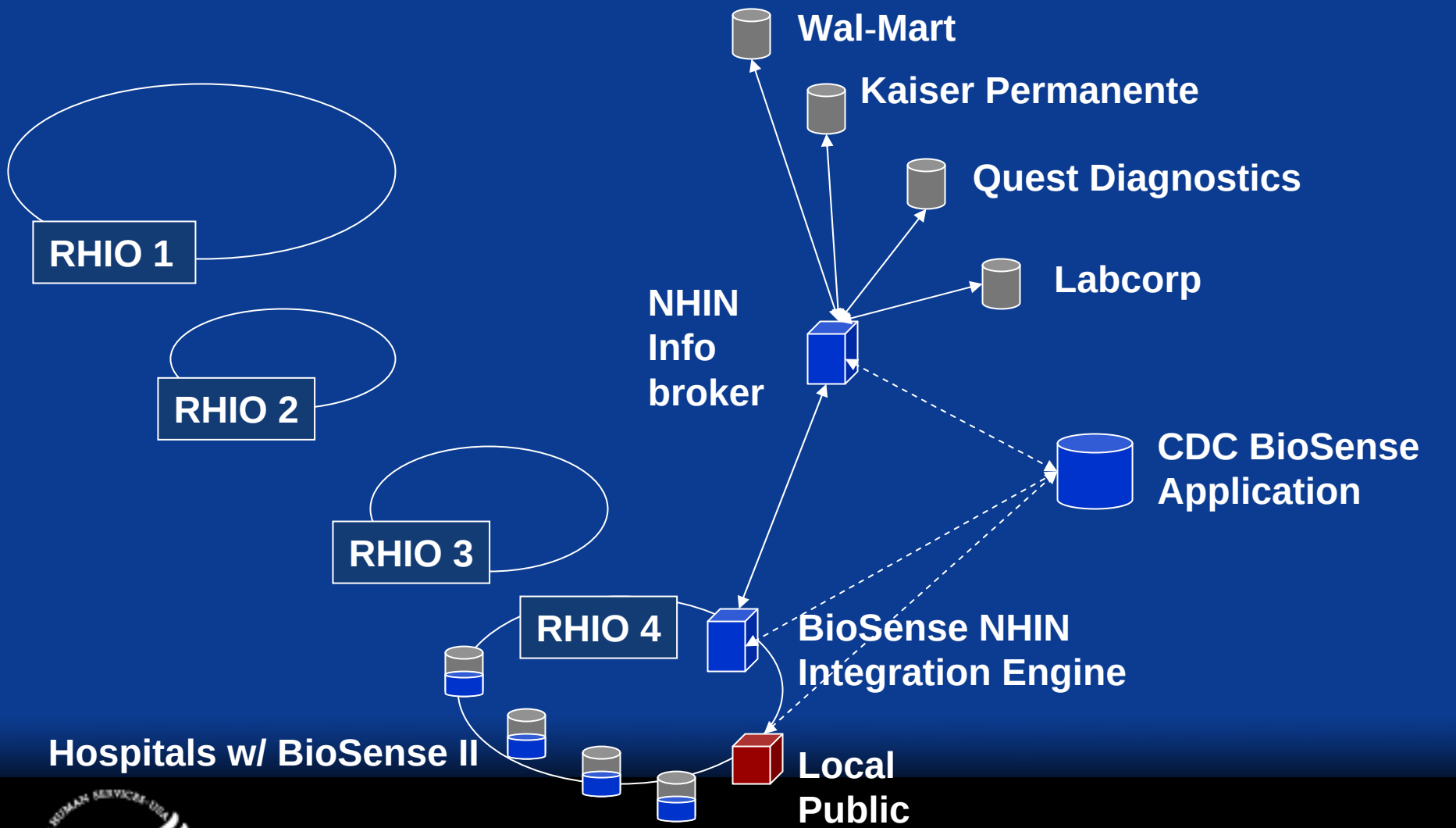
AHIC – a Public and Private Sector Collaborative

AHIC is the public-private collaborative that sets priorities and oversees and/or endorses HIT standards, certification, the NHIN, and policies on a national level.



- **AHIC** - American Health Information Community
- **HITSP** – Health IT Standards Panel
- **CCHIT** – Certification Commission for Health IT
- **NHIN** - Nationwide Health Information Network Prototypes
- **HISPC** – Health Information Security and Privacy Collaboration
- **State-level HIE Initiatives** – State-level Health Information Exchange Initiatives

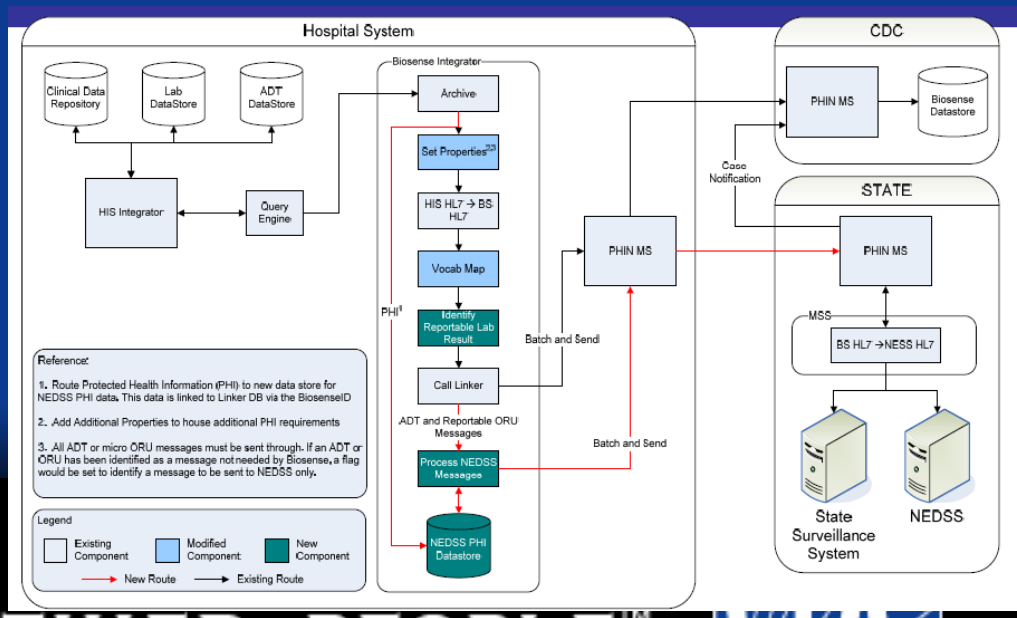
BioSense as Broker for National Resources



Open Source ELR Reporting Tool

- 9 states use RODS, an open source surveillance tool
  - 2 states forward data to BioSense
- Capture by adding ELR reporting functionality to open source toolset along with BioSense feed

BioSense ELR prototype



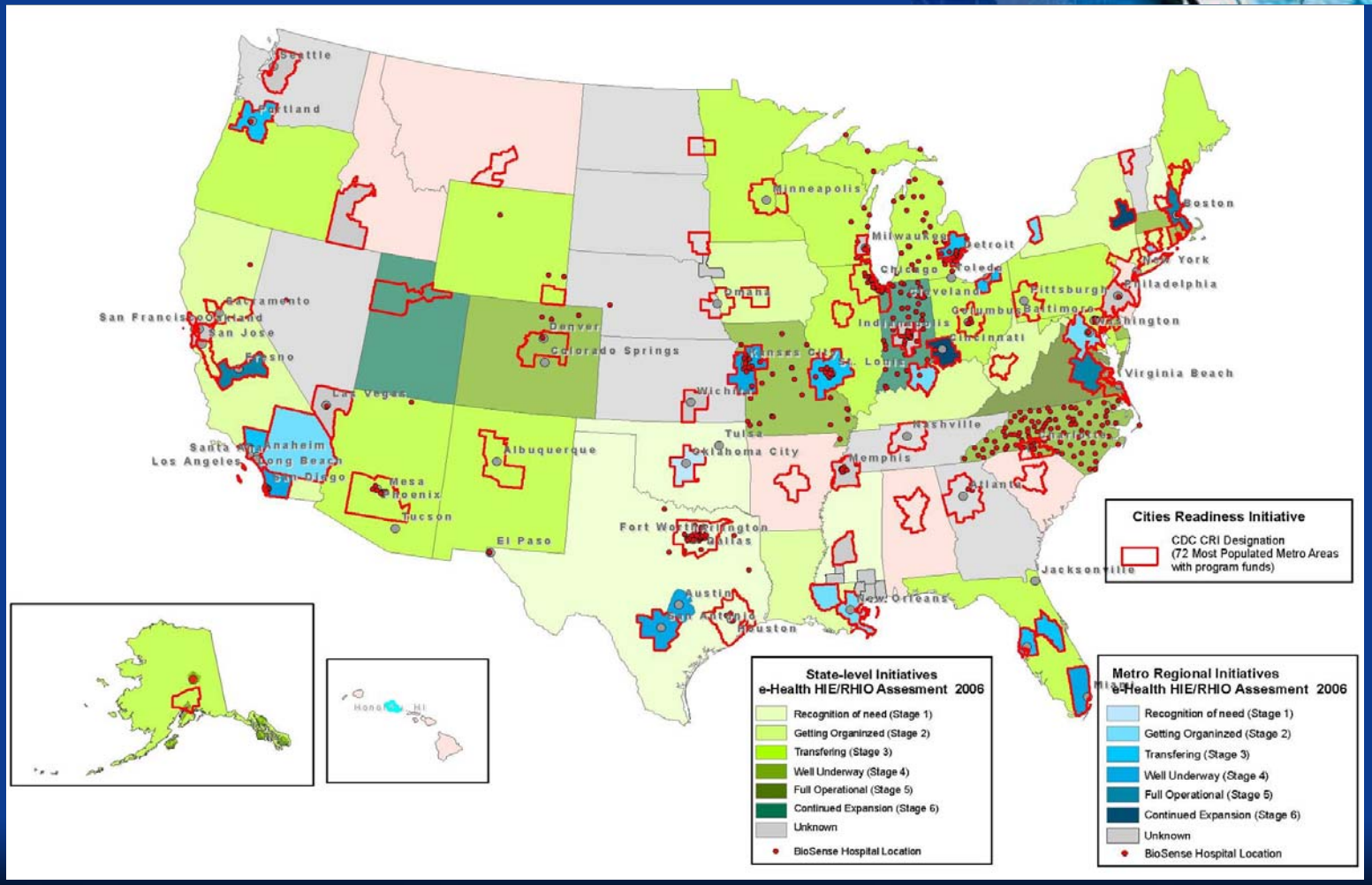
BioSense Extramural Research

- Extramural (CoE's, R01's, and Cooperative Agreements)
  - Nationwide impact
  - Example research topics
    - Value of NLP of progress notes
    - Grid technologies
    - Case recognition rules and strategies
    - Value of syndromic surveillance strategies

Bringing HIEs & Public Health Together

- Health Information Exchanges (HIEs) are an integral part of the vision for a Nationwide Health Information Network
- Benefit to all parties for HIEs and Public Health to work together
  - HIEs benefit to public health:
    - Electronic reporting of notifiable diseases
    - MRSA occurrence tracking
    - Enhanced biosurveillance at local, state, and national level
    - Sharing aggregated data across jurisdictional boundaries
    - Efficiency of repurposing already existing data for multiple uses including public health, disease registries, potential use for health statistics

HIE Infrastructure Available to Support Surveillance



Overall Strategy: Multi-level Regional Strategy

National surveillance and situational awareness

Regional alliances for systematic surveillance collaboratively with CDC

Federation of Local, State, Federal Data Resources

NHIN and HIE's

National data sources

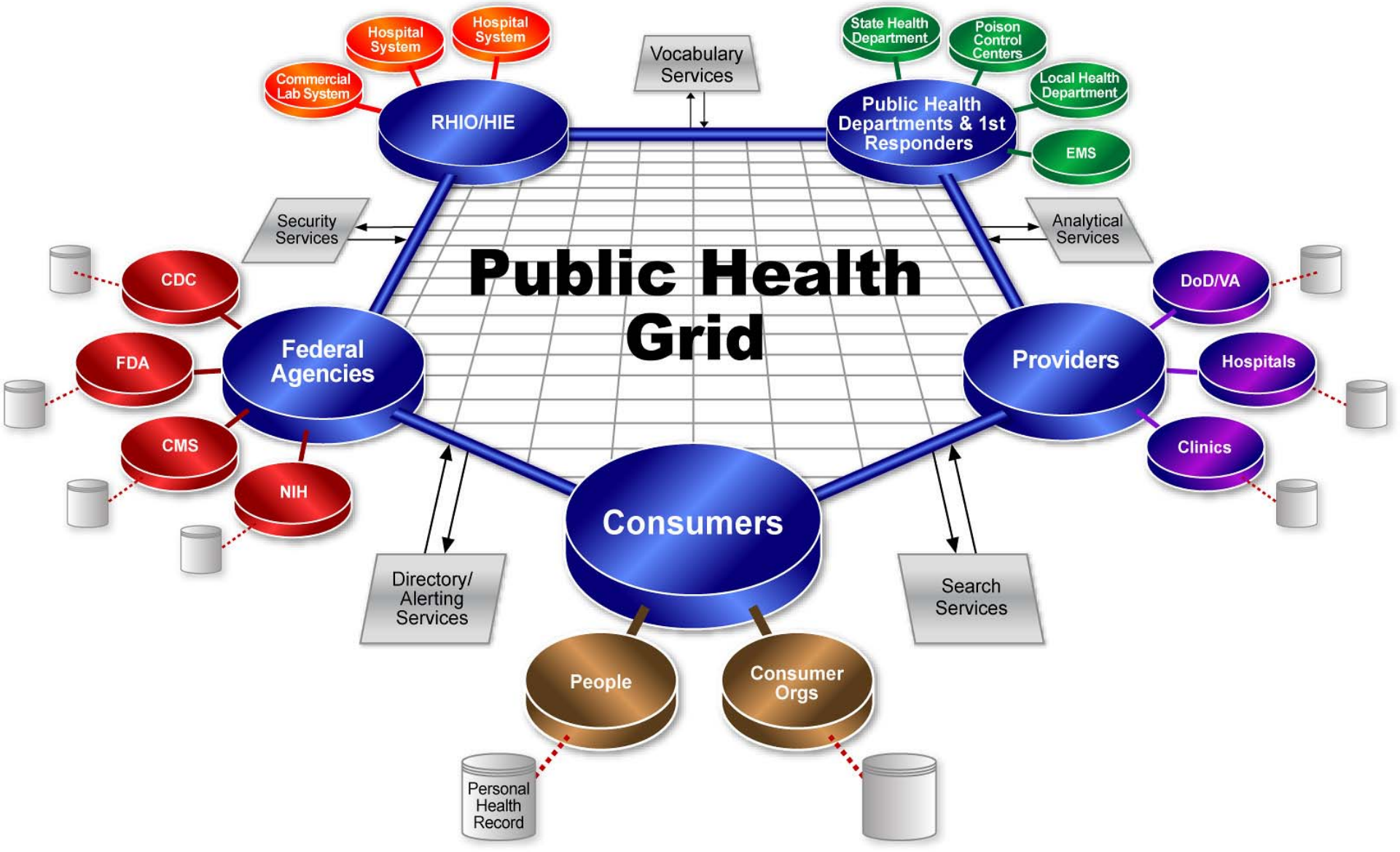
Primary data collection

Regional Surveillance Collaboratives

- The USA is a LARGE Country
- Someone needs to do the WORK of surveillance and maintain systems
  - State, local and CDC partnerships to systematically cover the United States
- Mechanisms need to be in place to share data
  - Uniform governance within a region
- Support and growth based on advancement of regional capabilities
  - States help each other

Goal State

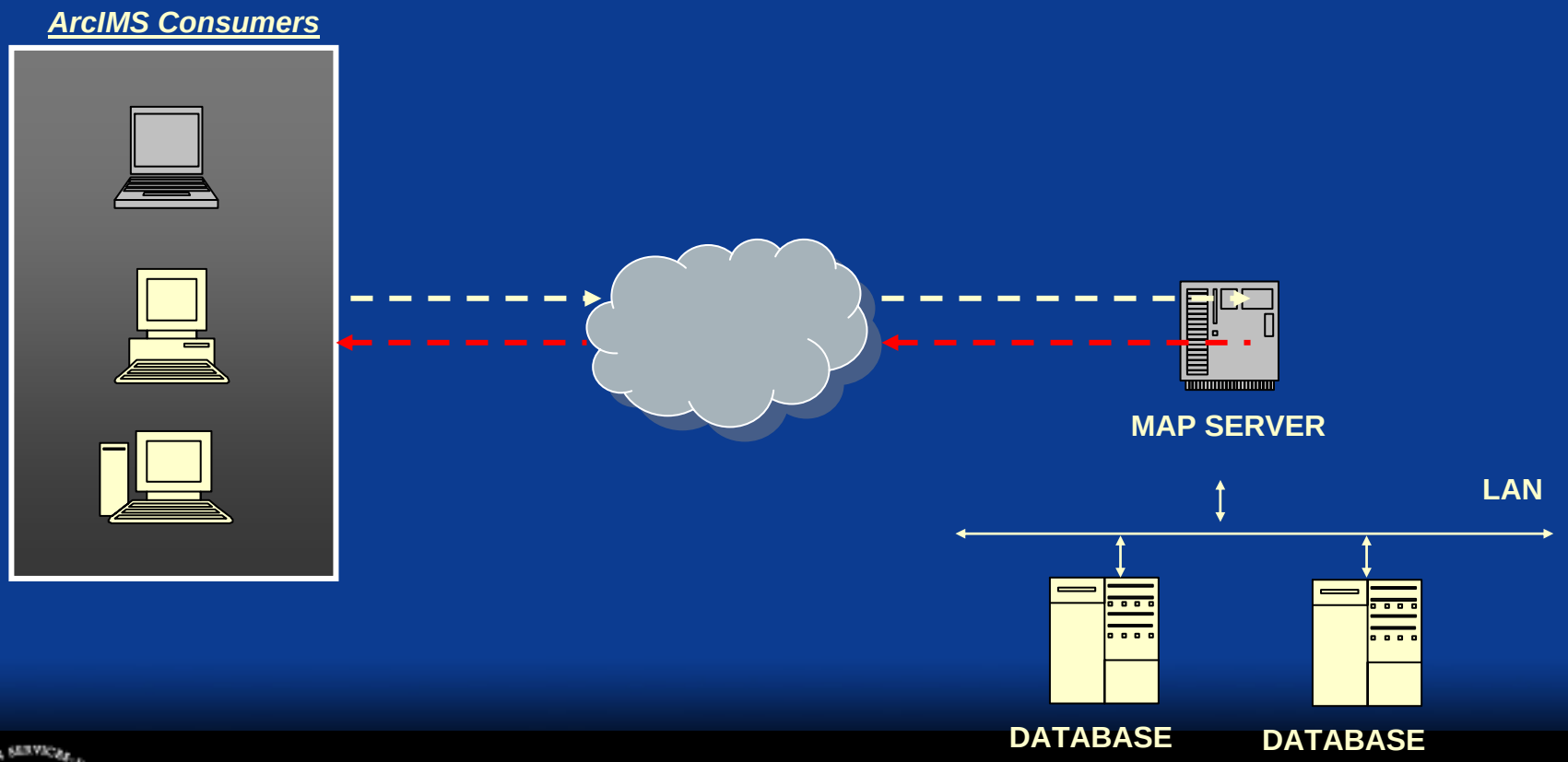
Collaborative, Efficient, Agile



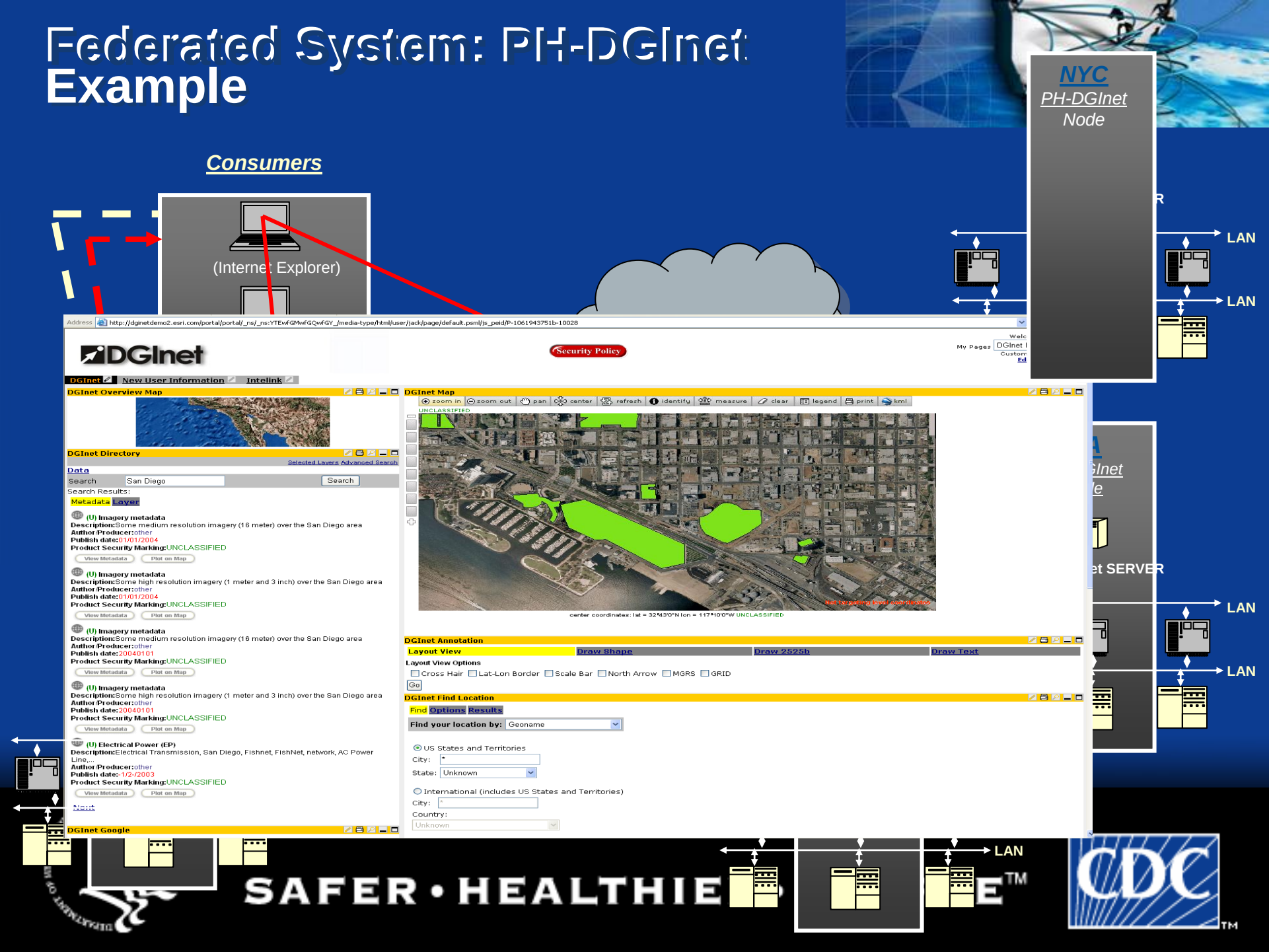
Federation of State and Local Systems

- Substantial existing investment
  - Syndromic technologies
- Local control of data paramount
  - Politics of control of data has been the primary obstacle to formation of a national system
- Technical solution to politics
  - Architecture of system should allow data to remain with each jurisdiction but allows analyses to be run across jurisdictions and combined

Traditional Client-Server



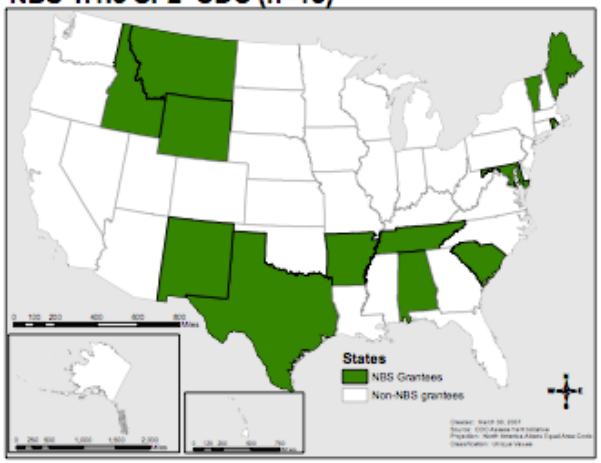
Federated System: PH-DGInet Example



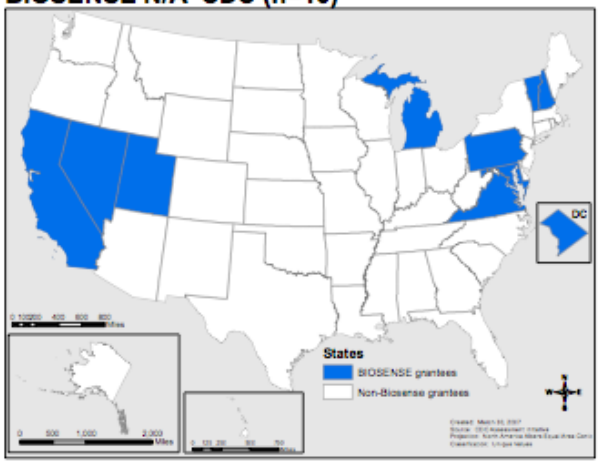
Scope of State and Local Systems that Could be Federated

EED Solutions Self-Reported by PHEP Grantees, August 2007

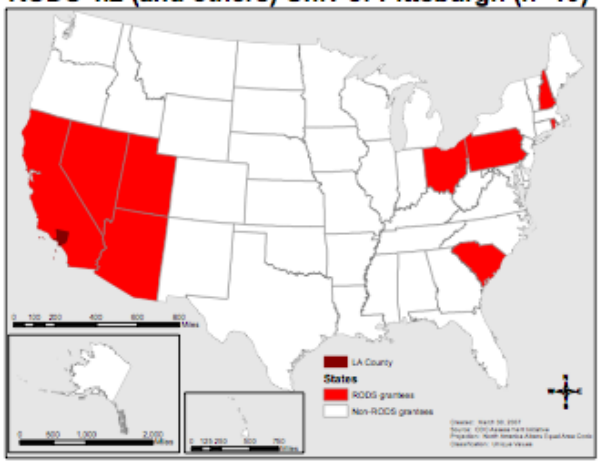
NBS 1.1.5 SP2 CDC (n=13)



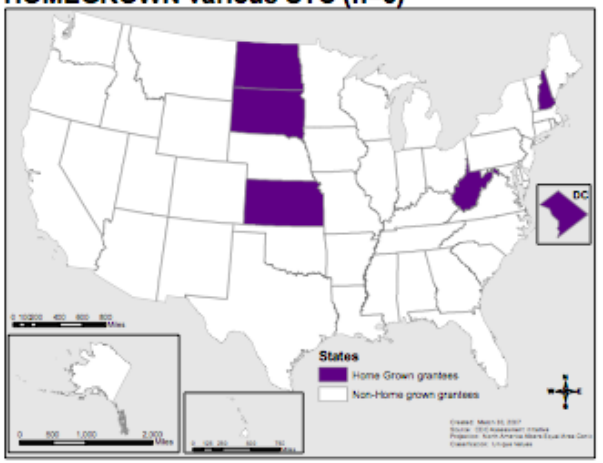
BIOSENSE N/A CDC (n=10)



RODS 4.2 (and others) Univ of Pittsburgh (n=10)



HOMEGROWN various STC (n=6)



Summary and Conclusions

If you want to travel fast, travel alone

If you want to travel far, travel together

African Proverb

- How to go far together
  - Integrate of Public Health practice with the NHIN
  - Single public health integration for clinical care providers
  - Collaborative development in Communities of Practice
  - Open Source
  - Decision Support
  - Coordinated research efforts and programs for enhancement of professional development