SensorNet
Technologies and Real-world Deployments

Presented by

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SensorNet Program
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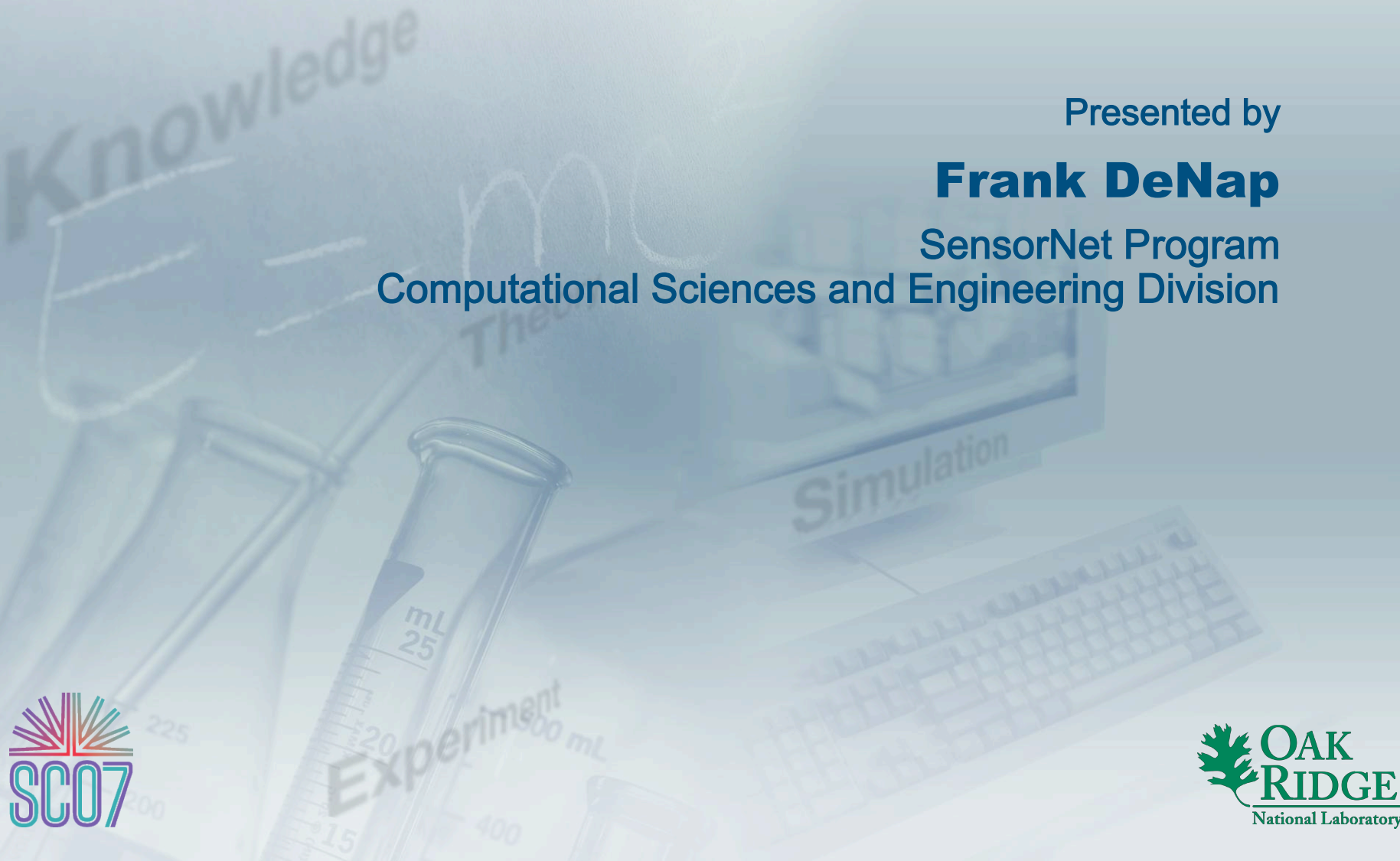

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Corridor security

ORNL's Multi-Modal Integrated Safety, Security and Environmental Program (M^2IS^2EP) addresses the integration of homeland security in the national freight supply chain infrastructure.

- "Just in time" vs "just in case"
- Risk management and mitigation
- Knowledge discovery
- Environmental insult
- Operational bottlenecks
- Aging infrastructure
- Capacity overload

Future safe, secure, and green transportation corridors will be inter-operable, integrated and multi-model.

Inter-operability within our transportation corridors must consider security, safety, and environmental protection and ultimately the timely and efficient delivery of our freight to its destination.

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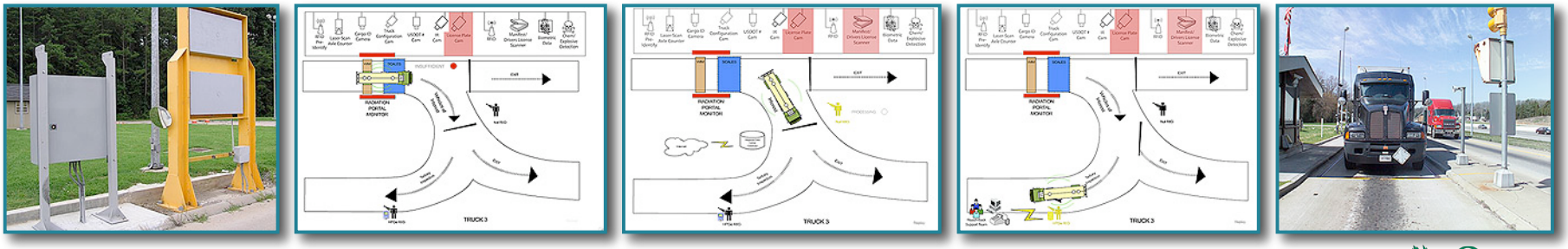
Corridor security (continued)

Mission success will hinge on the ability to insert, standardize, and institutionalize a multi-mission safety and security monitoring and inspection system in the freight transportation vector of the nation's supply chain.

- Improve situational awareness and communication between federal, state and local law enforcement through emerging knowledge discovery and machine learning technologies
- Smart corridors and enforcement systems through a national "Sensor-Pedia"
- Risk management and risk mitigation
- Reduced inspection time
- National policy and regulatory modernization
- Integrated strategic goals for national safety and security
- Screening and tracking through knowledge discovery and integrated sensors
- Real time crisis and disaster monitoring
- Virtual enforcement
- Security enabled trade data exchange



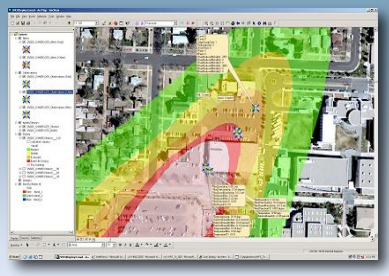
Sensor Network Area Protection System (SNAPS)

Integrated, standards-based mobile sensor system of near-real time data in homeland security operations

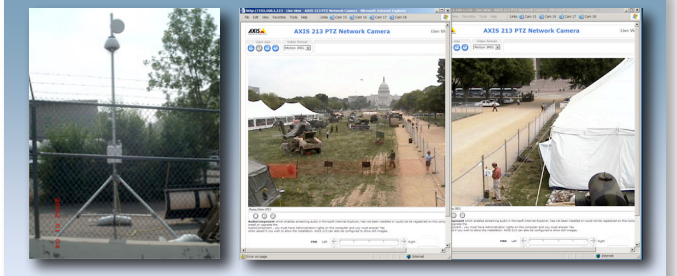
SNAPS Deployments:

- Public Service Recognition Week, D.C. Mall, May 2006, 2007
- CWID, June 2006
- Army ten miler, 2006
- Marine Corps CBRNE Seminar, August 2006

Mobile, re-configurable system components, rapidly deployed, mobile SensorNet operations center



GIS auto-HPAC plume at alerts

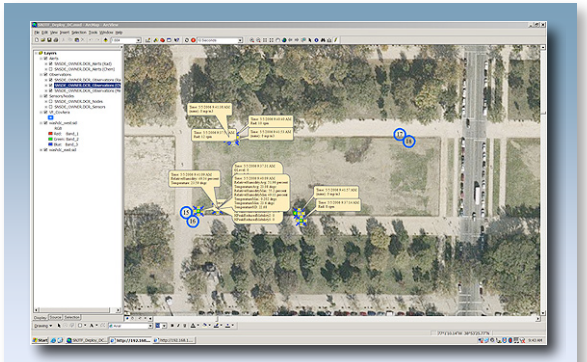


Tower based "Auto-Eyes-On" from wireless video slew to sensor alert

- 11 mobile chemical/rad sensors
- 4 video cameras (slew 2 sensor alerts)
- FIPS wireless (1 mile^2)
- Local servers and GIS viewer
- Transportable 6x6x13 ft trailer
- 2-4 hour setup

Wireless, GPS enables sensors with battery operations.

Sensors are 100% mobile.



GIS showing GPS locations of sensors

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SNAPS II Memphis region (commercialized version)

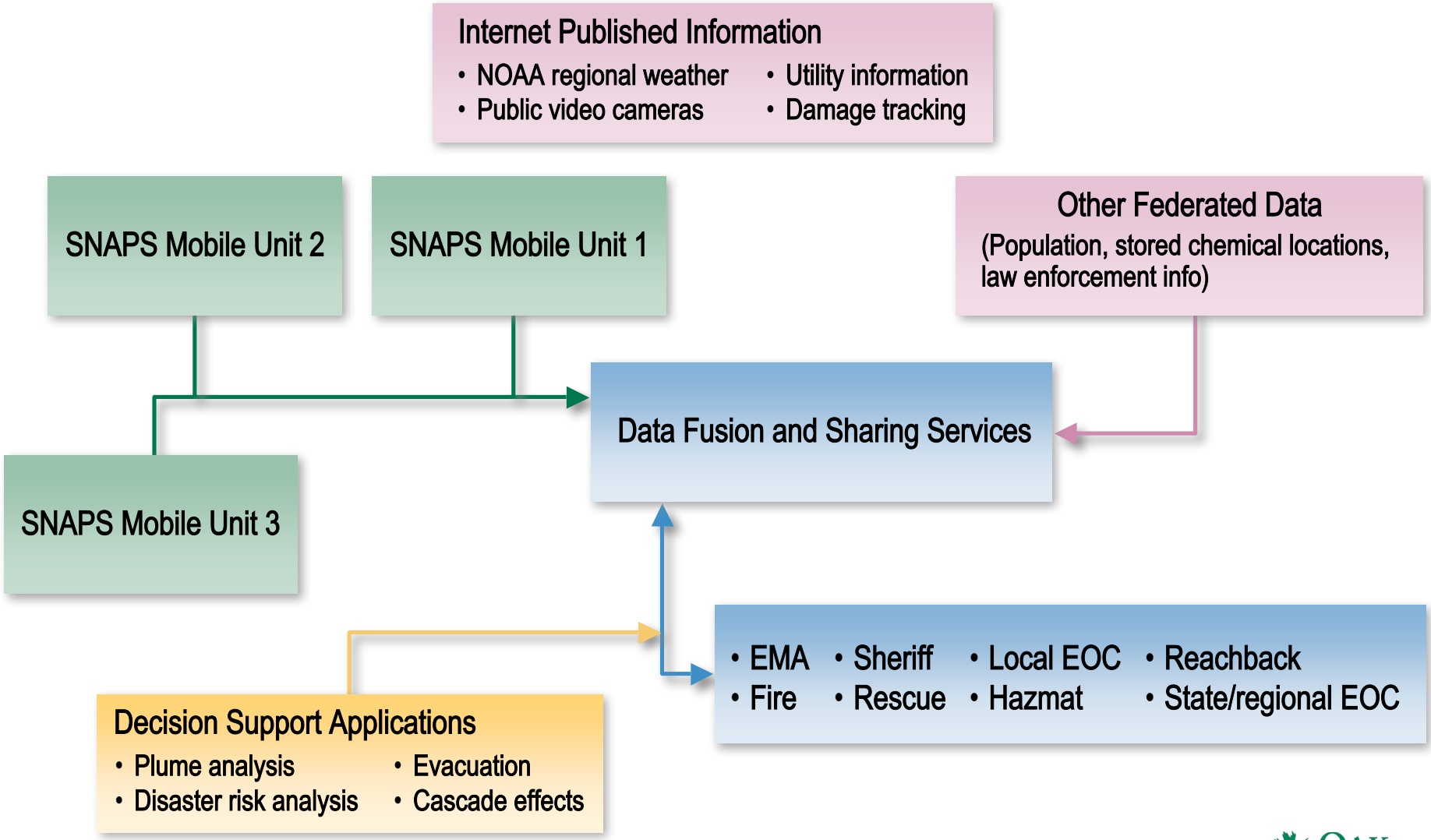
Area hazardous chemical releases are detected by specially designed sensors, located at special events.

Deployments 2007:

- Memphis in May
- Craftsman truck racing series
- Civil rights baseball game

SNAPS data sharing focus

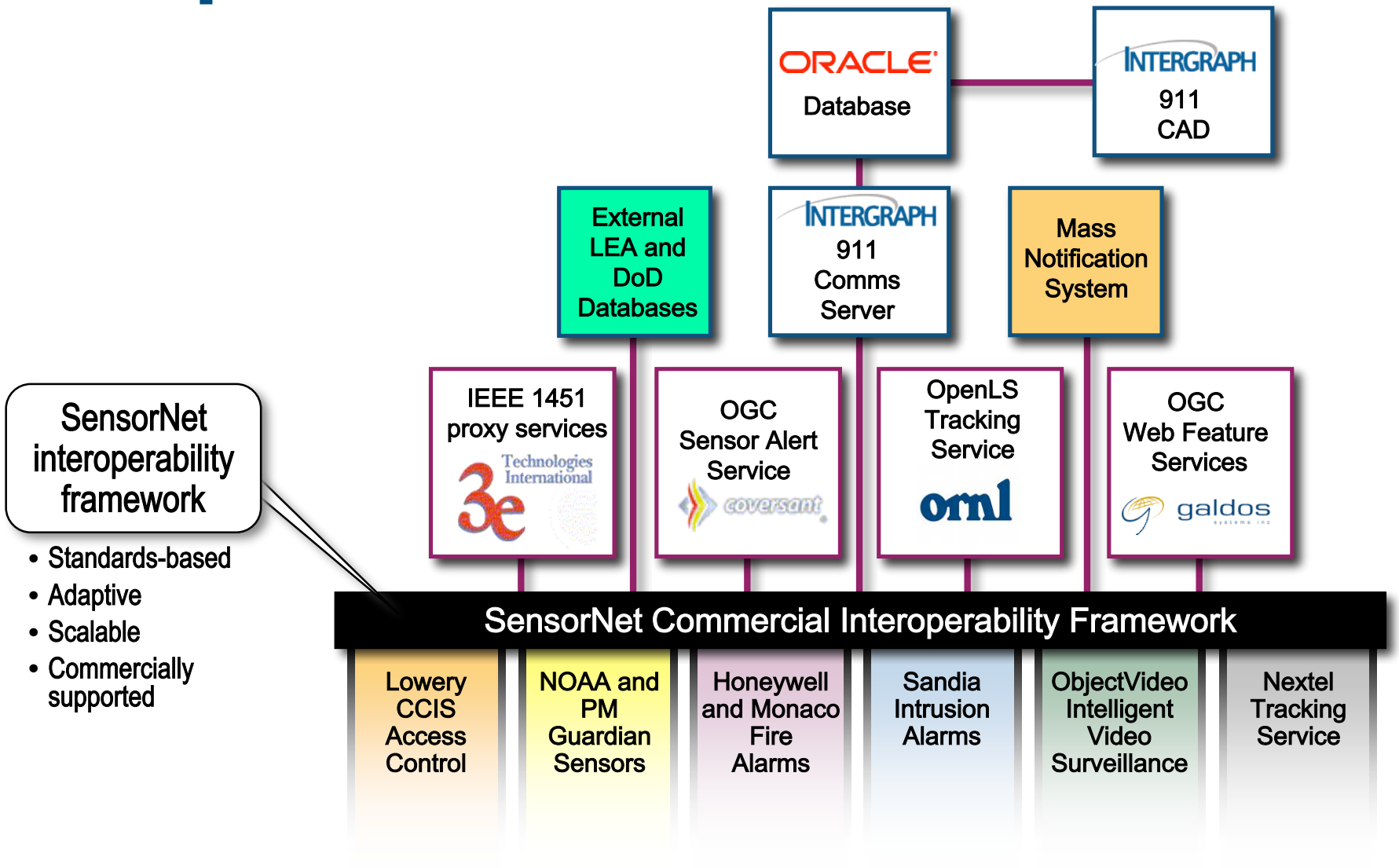
Real-time environmental data



Bragg Experimental SensorNet Testbed (BEST)

- 5-year DOE WFO agreement between Fort Bragg's Directorate of Emergency Services and ORNL BEST is the primary venue for the integration of the SensorNet program with a state-of-the-art 911 center to produce the prototype for a standardized Integrated Incident Management Center.
- BEST is providing Fort Bragg with an Automated Visitor Registration System for its access control points.
- BEST is providing Fort Bragg with a Mass Notifications System (MNS), a secure Life/Safety Network, and an Intelligent Video Surveillance System.
- BEST is providing Fort Bragg's first responders with an Automated Personnel Locator.

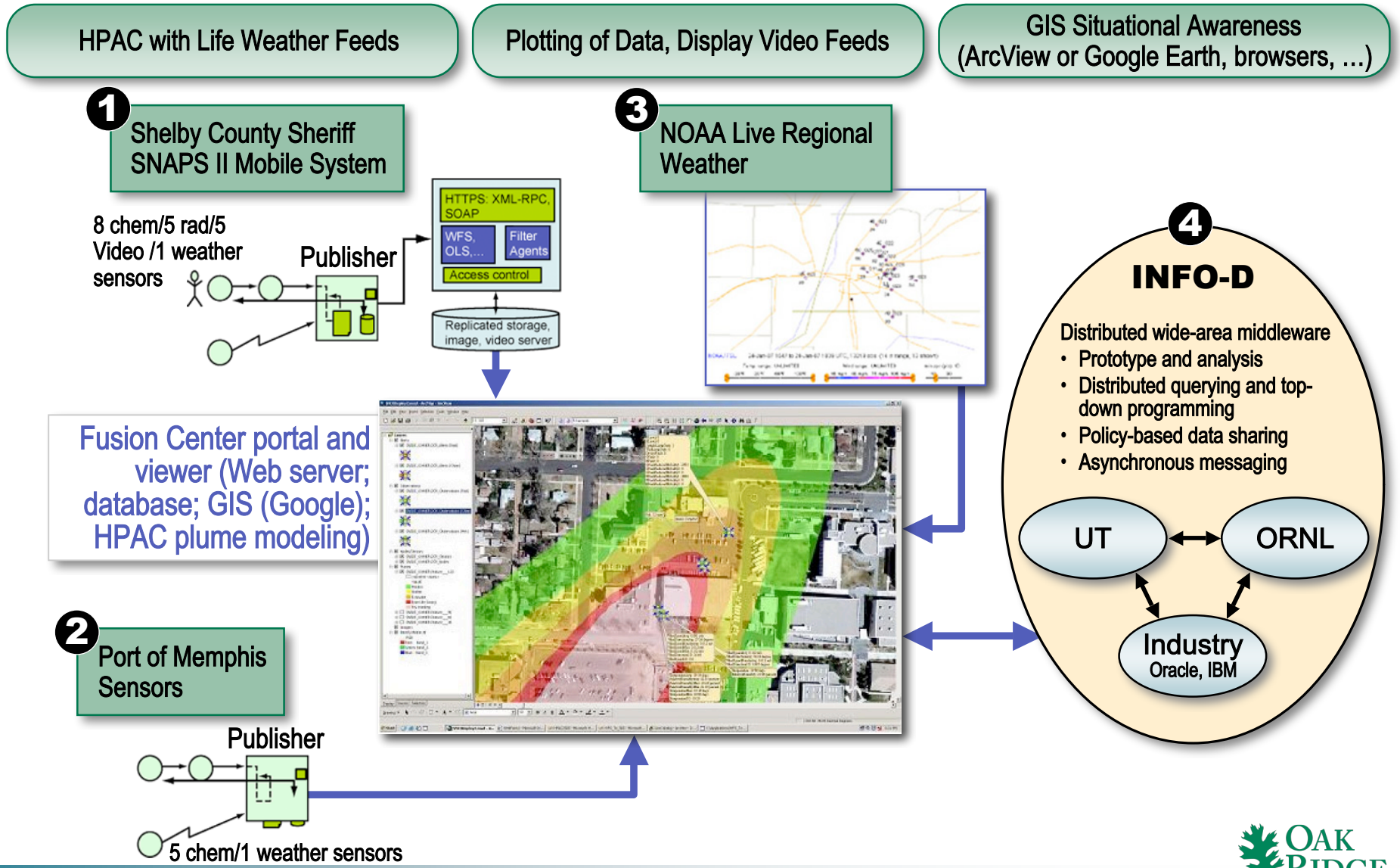
Fort Bragg's SensorNet framework for force protection



Shelby County (Memphis) Fusion Center (SCFC) project description

- Provide a computational platform for integrating sensor and data for use in decision making prior to, during, and after hazardous incidents in Shelby County, TN.
- Situational assessments in near real-time must be provided to multiple response agencies. SCFC allows the gathering and sharing of these assessments.
- Other fusion centers do not have real-time data sharing capabilities, limiting the decision making capabilities.
- The SCFC will provide near-real-time data visualization from two sensor systems, Port of Memphis and SNAPS II during deployments and plume model results.

Shelby County Fusion Center (SCFC)
SNAPS+POM+NOAA+INFO-D



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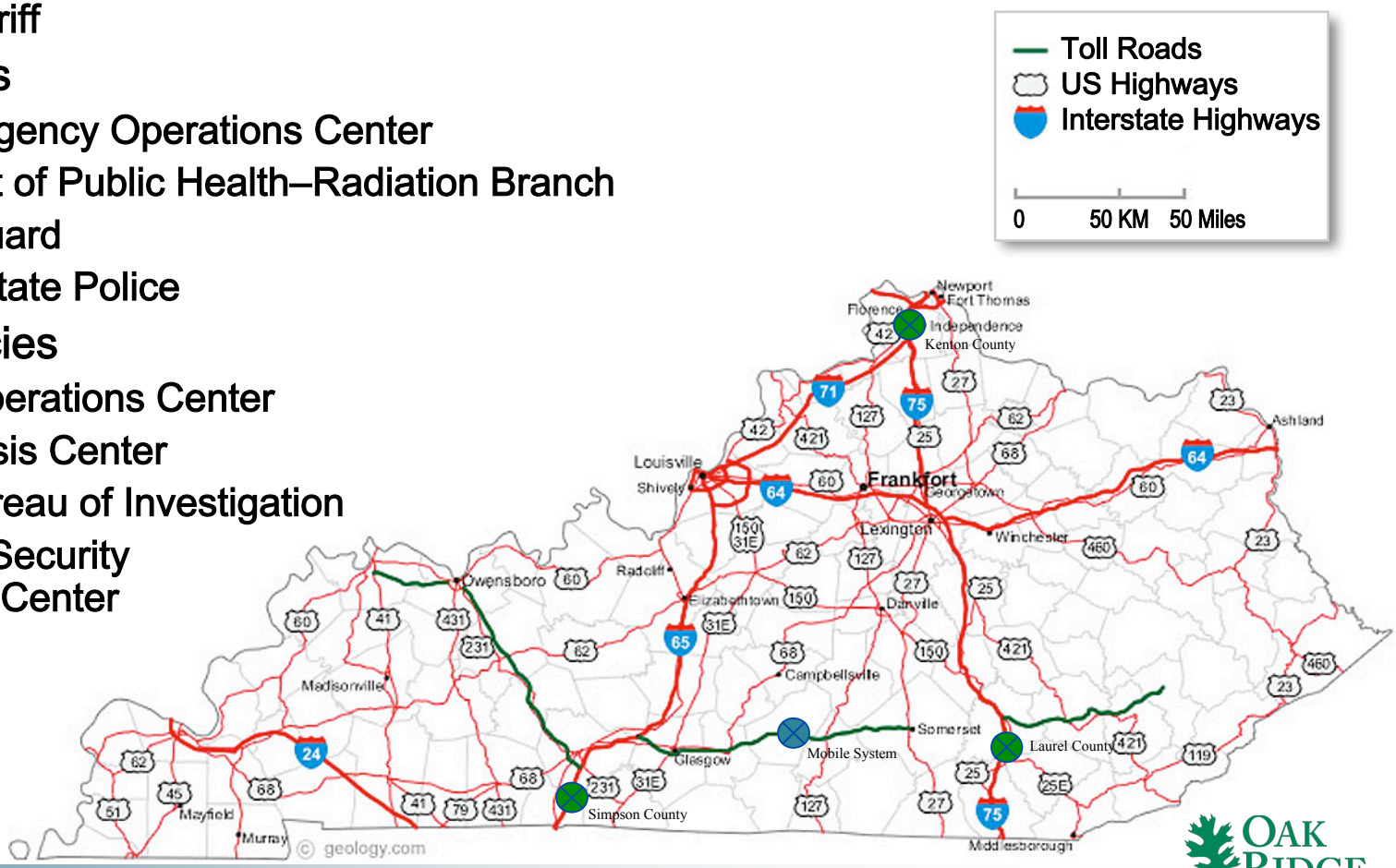
SERRI funded enhancements to Kentucky Intelligence Fusion Center

- Interoperable
  - Standards based
  - Seamless transfer of data between state and federal organizations
  - Orderly transition from interdiction to consequence management
  - Common on-scene awareness throughout responding communities
- Data collection
  - Kentucky's fixed and mobile commercial vehicle inspection stations
    - Laurel County–fixed
    - Kenton County–fixed
    - Simpson County–fixed
    - ISSES van–mobile
  - Hazardous materials and hazardous waste tracking system
    - Tracking high-risk materials movement
    - Tracking of placarded hazardous material shipments
- Data fusion
  - Correlation of data with FMCSA information
  - Correlation of data with NCIC information
  - Correlation of data with SAFER information
  - Facilitate trend analysis and data mining

SERRI funded enhancements to Kentucky Intelligence Fusion Center

Dissemination

- Local agencies
  - City police
  - County sheriff
- State agencies
  - State Emergency Operations Center
  - Department of Public Health–Radiation Branch
  - National Guard
  - Kentucky State Police
- Federal agencies
  - National Operations Center
  - Joint Analysis Center
  - Federal Bureau of Investigation
  - Homeland Security Operations Center
  - National Intelligence Council



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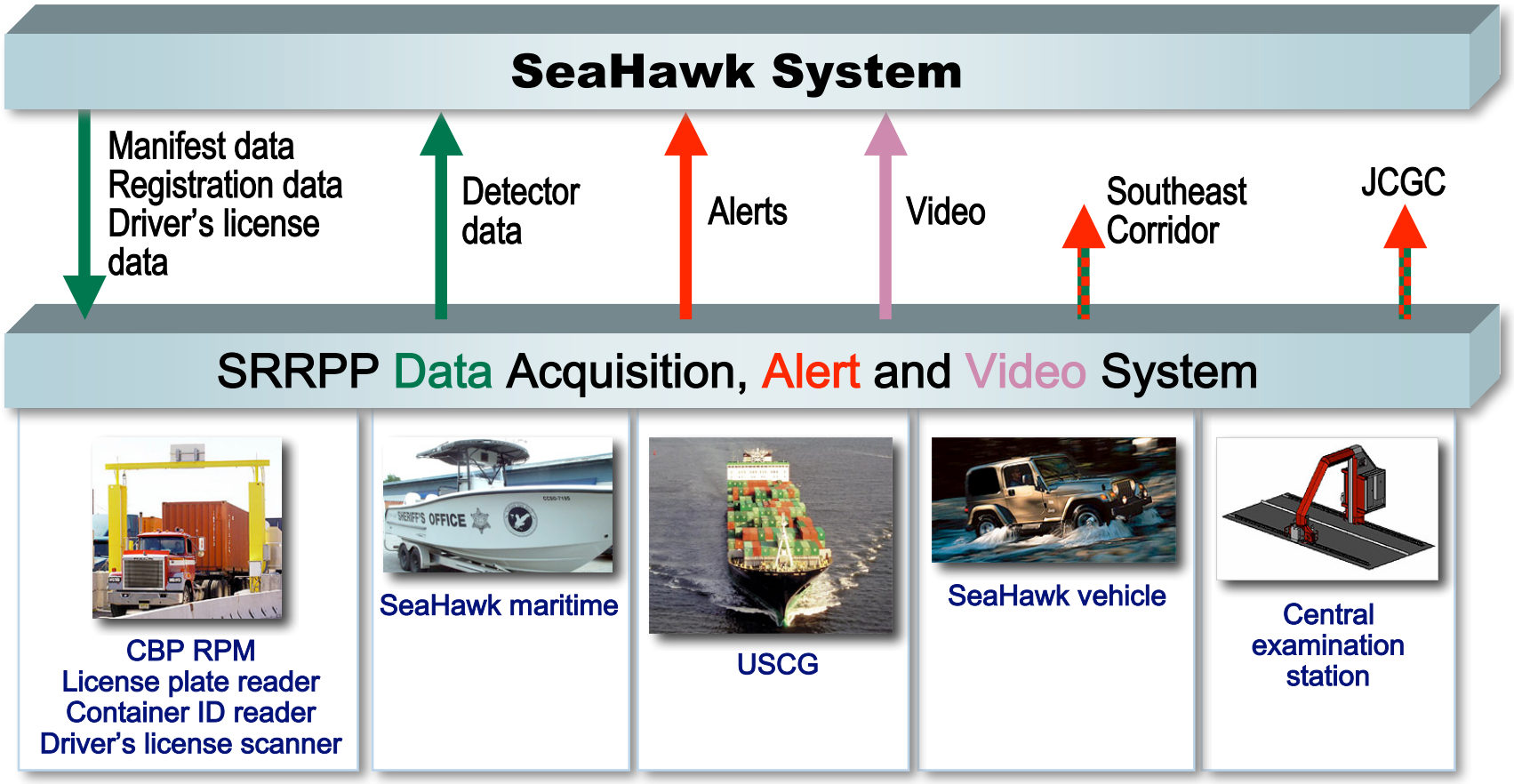
Southern Regional Radiological Pilot Project (SRRPP) overview

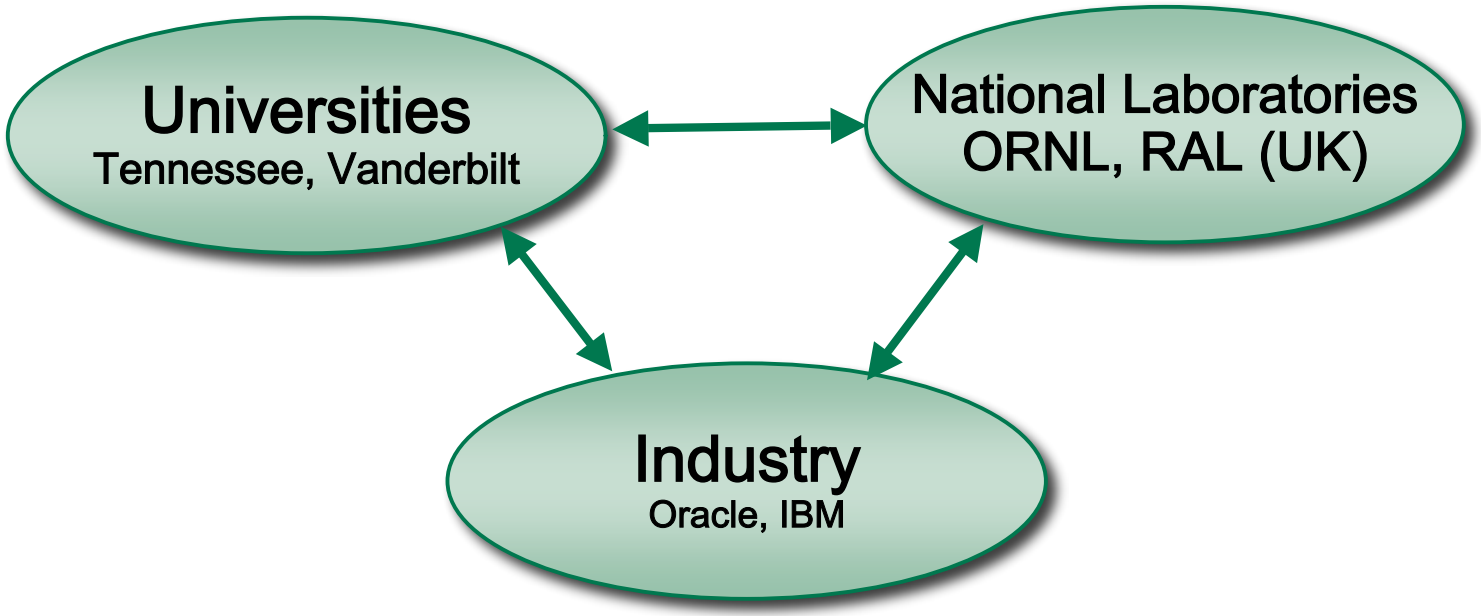
- Vision
  - Clearinghouse for CBP, USCG, SeaHawk TFO radiation detection
  - Tightly coupled into proposed Southeast Corridor
  - Information portal for DNDO joint center global connectivity
- Baseline
  - Deployment of handheld and mobile systems in operational environment
  - Data analysis
  - CONOPS development and evaluation

SRRPP vision



Information dissemination middleware (INFOD)

Broad partnership:

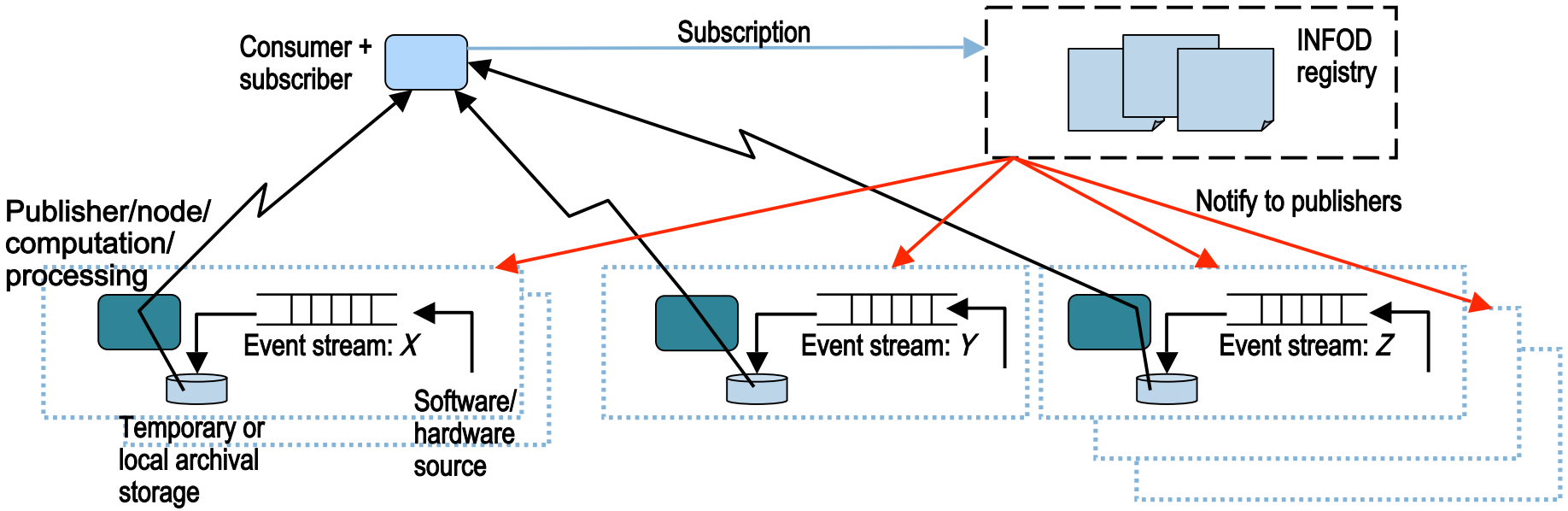


Infrastructure goals

Distributed wide-area middleware

- Prototype and analysis
- Distributed querying and top-down programming
- Policy-based data sharing
- Asynchronous messaging

INFOD model and function



- INFOD matches communities of interest and helps identify what message to be sent, to whom, and when to be sent.
- Publishers determine consumers dynamically based on data constraints, and messages are directly delivered to the consumers.
- Information flow changes dynamically as the condition or state of the publishers and consumers of data change.
- The discovery or matching process allows the formation of a flexible overlay for dissemination of content, rather than the fixed overlays of traditional pub/subs.

Southeastern Transportation Corridor Pilot (SETCP)

- Improve detection and reporting capability in states where it exists and create capability in states where it does not
  - Existing weigh stations with portal monitors: TN, KY, SC
    - Improve secondary inspection, mitigate bypass scenarios
  - States without portal monitors: VA, NC, FL, MS, AL, GA, DC
    - Introduce radiation detection systems at weigh stations with modern infrastructure (WIM, T1…)
- Prototype and evaluate interfaces to regional reachback and JAC connectivity
- Leverage existing radiation emergency mutual assistance plans

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Note: Initial detector locations are not based on an optimized risk-based analysis. However, results will inform the decision to provide rad/nuc detection capabilities to weigh stations in all 50 states.

ORNL SETCP data viewer

Objective

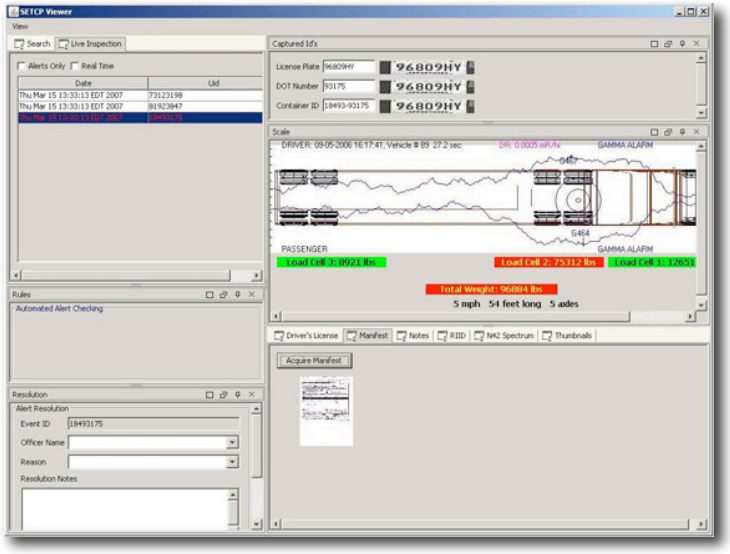
- Provide local data acquisition control and visualization and remote data visualization for SETCP inspection stations.

Description

- Local viewer provides data acquisition control at the inspection station, as well as visualization. Remote viewer allows inspection station information to be viewed by state fusion centers and DNDO JACIS.

Key deliverable/outcome

- Interoperability with JACCIS, SETCP, state fusion centers, and local inspection stations.



Strengths

- Configurable (dockable windows) for each user.
- Web based.
- Captures adjudication information.
- Usable by local, state, and national organizations.
- Java-based application.
- PKI authorization.

Weaknesses

- Optimized for commercial vehicle inspection station information.

Products

- Web downloadable Java application: http://www.us.sensornet.gov/wsv_v2.msi.

Status

- Viewer currently operational in and with Tennessee and SC fixed inspection station.
- Fall 2007, viewer will also be operational in and with mobile inspection stations in Tennessee and South Carolina and with Kentucky mobile inspection station data.
- Winter 2008, viewer will also be operational with ASP Variant-L based mobile inspection stations in Florida, Alabama, Virginia, and Washington D.C.
- Winter 2008, viewer will also be operation with ASP Variant-C based fixed inspection stations in Mississippi and North Carolina.

Contacts

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