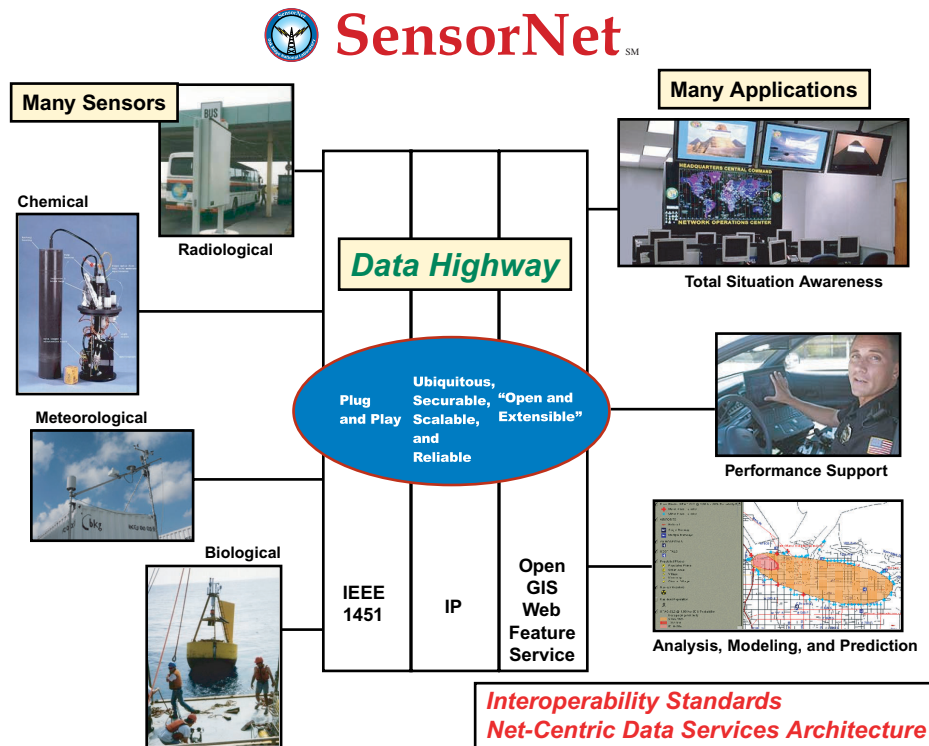


SensorNet

A System of Systems to Provide Nationwide Detection and Assessment of Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Threats

The Department of Energy’s Oak Ridge National Laboratory (ORNL) and strategic partners that include the Open GIS Consortium, National Oceanic and Atmospheric Administration (NOAA) and the private sector are working to design and develop a standards-based comprehensive incident management system available to Federal, state and local governments and the private sector for the real-time detection, identification, and assessment of chemical, biological, radiological, nuclear, and explosive (CBRNE) hazards. SensorNet will provide a common research, development and test service center for providing a common response protocol and common data highway for comprehensive incident management. The system will provide a secure and reliable information infrastructure to quickly and accurately collect and convey critical information, from any source, to all responsible parties.

Strategy to Protect the Nation: *The capability to dispatch informed first responders within minutes following a CBRNE event will save lives.*



Rapid Deployment of a Nationwide System: Because many of the components of the SensorNet system already exist, the initial infrastructure for a nationwide system to detect, identify, and assess CBRNE threats can be created rapidly. The SensorNet system will incorporate the following:

- **Sensor Technologies:** Chemical, biological, and radiological sensors will be placed at strategic locations, with the specific placement of sensors based upon threat analyses. SensorNet’s modular and open architecture will allow easy upgrades to the latest sensor technologies as they are developed and become available.

- **Modeling Systems for Real-Time Threat Assessment:** Once a CBRNE event is detected by chemical, biological, and radiological sensors, the modeling system will, in real time, produce a plume model, determine the number of people exposed, predict immediate and latent effects on the population, and propose responses to the event.
- **Nationwide Coverage:** The SensorNet infrastructure will be created by integrating communications and data management systems at strategic sites. Nationwide, communications field service groups will rapidly install, maintain, and upgrade on-site systems.
- **Nationwide Real-Time Remote Communications:** The SensorNet communication system will provide secure and redundant methods of communication between the sensor sites and local, regional, and national operations centers. The use of communications protocol standards will allow for a choice of equipment and future seamless upgrades of the system.

Tennessee: On March 12, 2002, ORNL performed successful timing tests using ORNL and commercial sensing technologies combined with existing infrastructure simultaneously at three cities in the state. Within 96 seconds of interaction between chemical simulants and the detectors, SensorNet correctly detected and identified the chemicals released, determined the relative amount of release, conveyed pertinent information to the command center, and created a projection of predicted plume movement and population impacts over time. ORNL is currently linking DOE's portal gate monitors on Interstate 40/75 using SensorNet's common data highway. These portal gate monitors rapidly inspect cargo for radioactive materials at a truck weighing station that handles up to 14,000 trucks a day.

Washington, D.C.: In late 2002, NOAA's DCNet system was upgraded to include SensorNet technology. Originally configured to monitor airflow in an urban environment, DCNet has been expanded to include additional sensors and SensorNet's enhanced data processing, data storage, and communications. The combined DCNet/SensorNet operational test bed will soon include automated predictive plume modeling to assess the direction and impact of toxic airborne releases.

Ft. Bragg, NC: Early in FY 04, ORNL began a test bed with Ft. Bragg which will determine the requirements for a *total installation awareness system* using the SensorNet infrastructure.

Mobile Sensor: A high-priority item is a SensorNet mobile system that can be rapidly deployed to problem areas and/or national special Security Events such as conventions, major sporting events, etc. also using the SensorNet infrastructure.

Leverage Cost: With the deployment of SensorNet's common architecture and communications system, the technology can be put to other uses that will increase the nation's global competitiveness and enhance economic growth. For example, at the same time that the SensorNet system monitors national security, its sensing and communications capabilities can be used for enhanced weather analysis and prediction, traffic control, aircraft surveillance, inventory tracking, earthquake monitoring, and the measurement of atmospheric gases in urban areas.

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