The University of Utah
Biomedical Informatics

Enhancing caBIG™ Workflow for Multi-Tier Distribution

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Introduction

caBIG™ Integration

caBIG™ provides a GRID based application environment with data abstraction and vocabulary services, workflow management and a security framework.

Sensor Abstraction Interface

It is proposed to provide a sensor abstraction interface, using caDSR, enabling caBIG™ workflow aware applications to obtain local and global access to sensor data.

Applications from any caGRID accessible node will be able to utilize the collected data.

Example Application

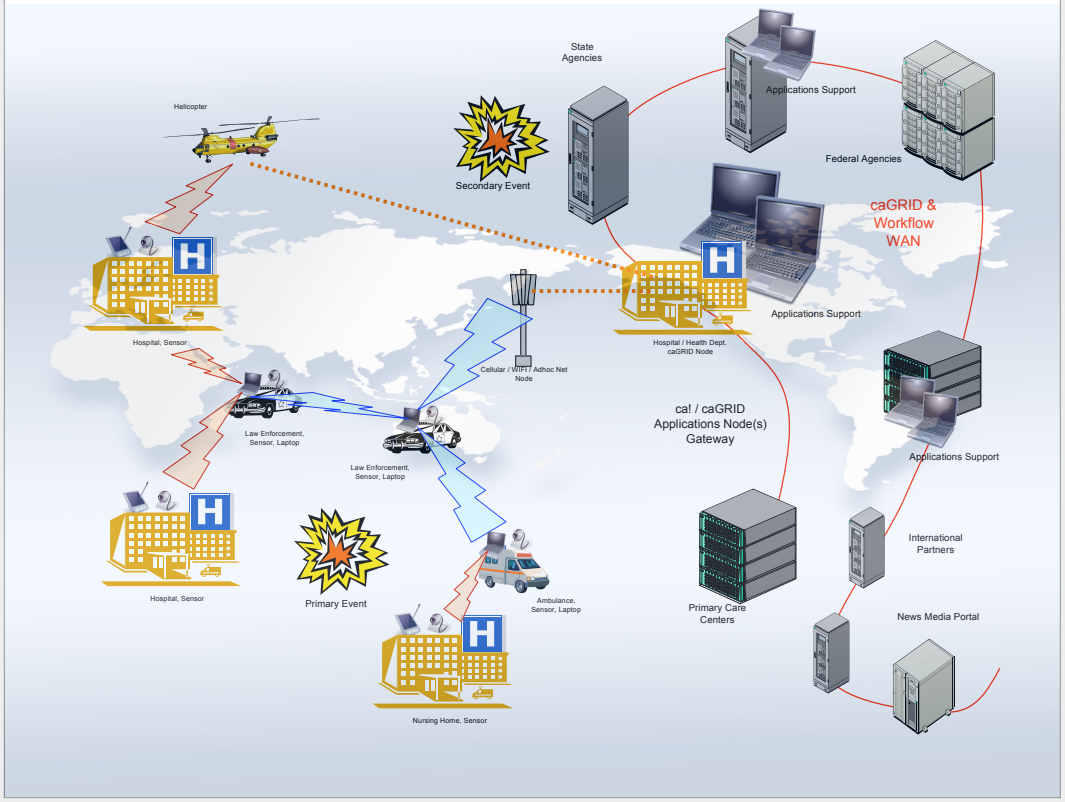
We have chosen a disaster scenario using radiation level sensors to illustrate how sensors mounted in static facilities and first responder vehicles can be relayed via an ad-hoc wireless network to various hospital or government facilities.

Data can be analyzed locally, for local planning and health care provisioning purposes, or accessed via the GRID by a hierarchy of city, county, state, and federal agencies.

Application Hierarchy

Proposed architecture is designed to use existing low cost infrastructure as a highly resilient mechanism for relaying sensor data. The network will piggy-back on the first responder networking systems and the applications layer will utilize caBIG™ services.

caBIG™ Example Multi-Tier Application via Standardized Sensor I/F



Features

- Sensor abstraction via caBIG™
- Multiple tier applications
- Highly available system at wireless mesh and GRID levels
- Low cost by exploiting existing infrastructure
- Standards compliant, caBIG™ certification
- Enables first responder, clinical and surveillance applications

Design Criteria

Low Cost / Existing Infrastructure

Use existing first responder systems for sensor networking and caGRID workflow and distributed services for distributed analysis applications environment.

Low cost sensors mounted in facilities and first responder vehicles. Sensors provide web server interfaces for data retrieval.

High Availability

Sensor network uses a self healing mesh network with first responder vehicles as the network fabric when power and communications is interrupted. All sensors and relay nodes are 12VDC auto battery powered.

Applications environment is distributable to any caGRID node and is caGRID workflow enabled.

Standards

Applications built on caBIG™ GRID architecture, utilizing caGRID workflow.

System provides sensor abstraction via caDSR system.

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