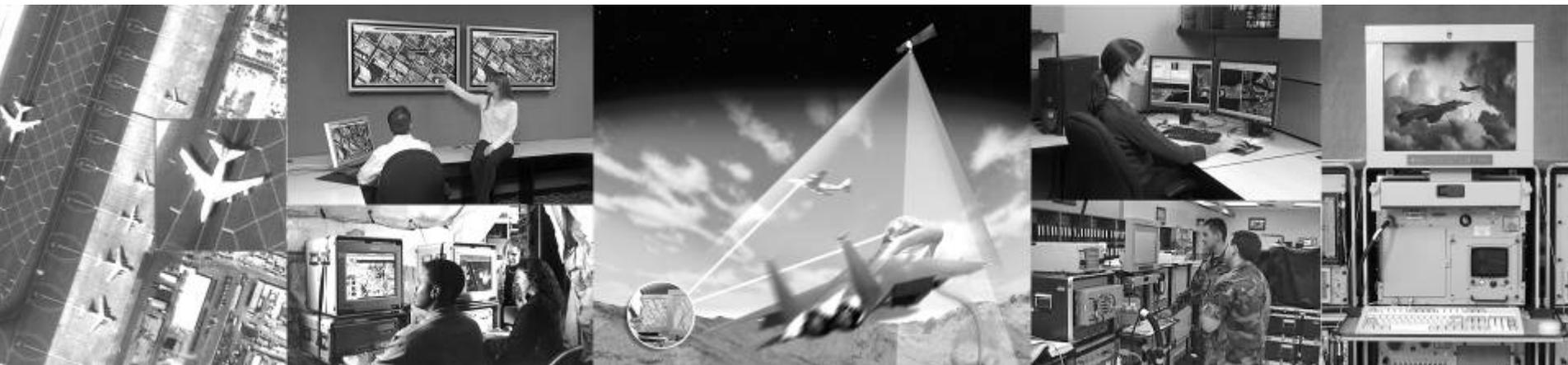


Geographically Enhanced Business Continuity Operations BAE Systems incidentOS

November 7, 2007

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Background

- BAE Systems Security Operations Center
 - Based in Merrimack, NH
 - Operations run 24 / 7 / 365
- Major incidents within BAE in '06
 - Johnson City, NY complex
 - Susquehanna River flooding
 - Coordination of 50+ people
 - Nashua, NH Canal Street location
 - Nashua and Merrimack River flooding
 - Coordination of 90+ people
- Coordination requires
 - Shared understanding of the situation
 - Communication between resources
 - Progress of response activities compared to pre-defined plans

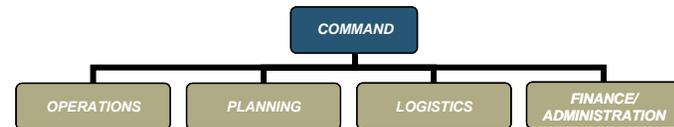


Needs and Requirements

- Our SOC requires a comprehensive solution
 - Plan, respond, and recover from an incident
 - Protect people and property
 - Consistent view of incidents
 - Up to date and reliable information
- The successful solution must
 - Be utilized on a day-to-day basis, not only in an emergency
 - Leverage shared technology based on accepted standards
 - Support national standards for emergency response
 - NIMS and ICS
- These needs are not unique to BAE
 - Interoperability is paramount to a quick, coordinated emergency response

National Standards for Emergency Response

- National Incident Management System (NIMS)
 - Est. by HSPD-5 in 2003
 - Improved coordination between all response levels
 - ICS required in all domestic incident responses
 - ICS adoption condition of Federal funding
- Incident Command System (ICS)
 - Conceptual approach to incident management
 - Integrated and agile organizational structure
 - Aids in domestic incident management activities
 - OSHA recommending Incident Command System (ICS) training

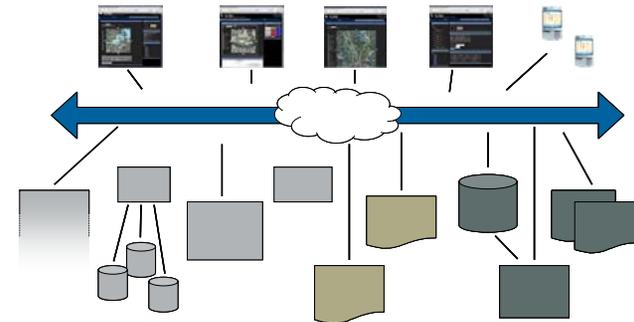


The Environment

- OSHA Voluntary Protection Program Audit
 - Performed at the Johnson City, NY facility (07/06)
 - Recommended ICS Training for Emergency Response Team
 - Ability to model HazMat release based on proximity to highway
 - Plan, exercise, AAR and Hotwashes
- The more we listened, the more we heard
 - A lot of solutions, but none addressing the need
 - Solutions are not focused and too complex
 - SAFECOM report (01/07)
 - 69 out of 75 cities > inadequate interoperability
- Complete picture
 - Fuse response plans and mitigation strategies
 - Bring geospatial analysis and visualization into the process
 - Seamless integration with necessary tasks to support a Crisis Management Team

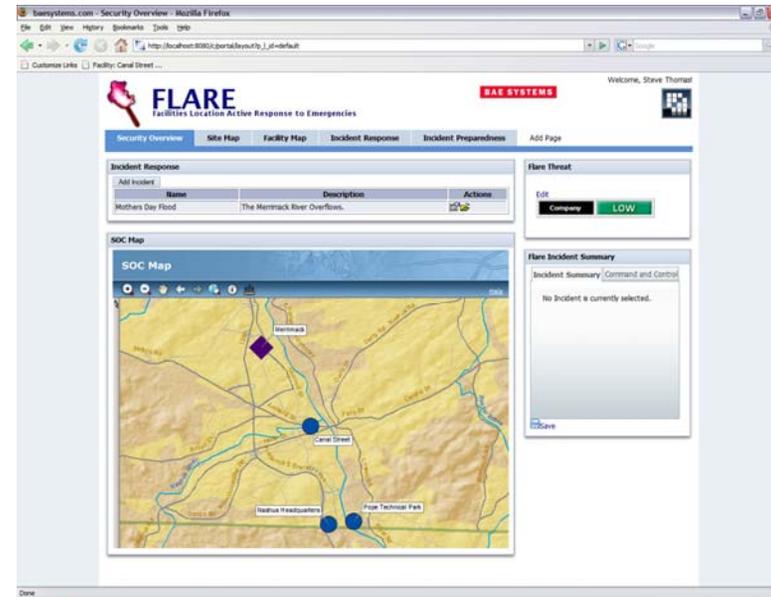
Proposed Solution

- Primary Capabilities
 - Provide role specific information to each user
 - Present a complete picture of the situation
 - Resources
 - Environment
 - Response Progress
 - Adaptable and scalable to meet wide ranging needs
 - Different response plans for a location
- Lends well to a SOA approach
 - Thin-client with focused content for individual users
 - Adaptable and scalable to meet various needs
 - Leverage mainstream IT practices and geospatial capabilities



BAE Systems incidentOS

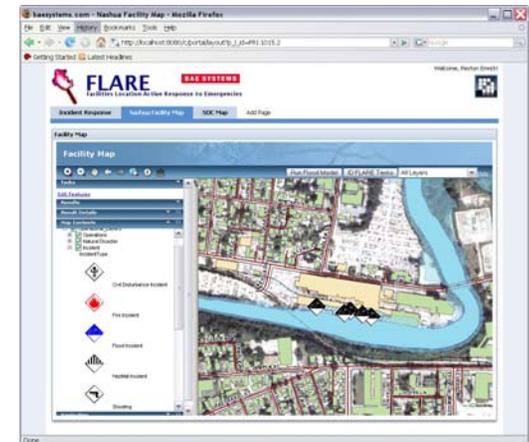
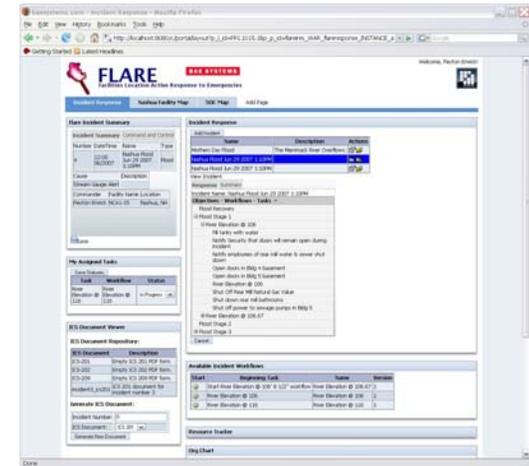
- Basic Capabilities
 - Role based access to control content
 - Customizable interface for each user
 - Resource tracking, notification and alerting
 - Orchestrate resources to tasks
 - Integration with industry leading notification providers
 - Integrate real-time data with decision making
 - Weather
 - Stream gauge information
 - Document creation and storage
 - Document repository created for each incident
 - ICS forms can be automatically populated



BAE Systems incidentOS

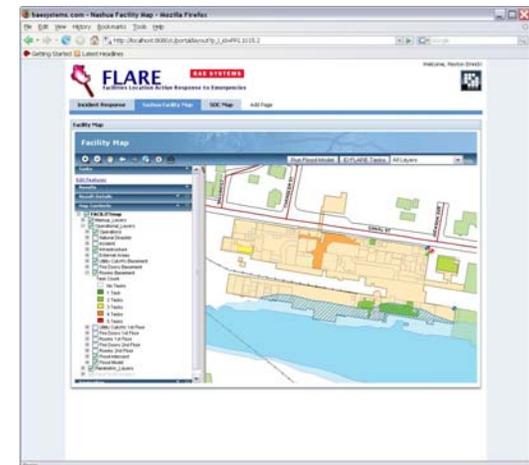
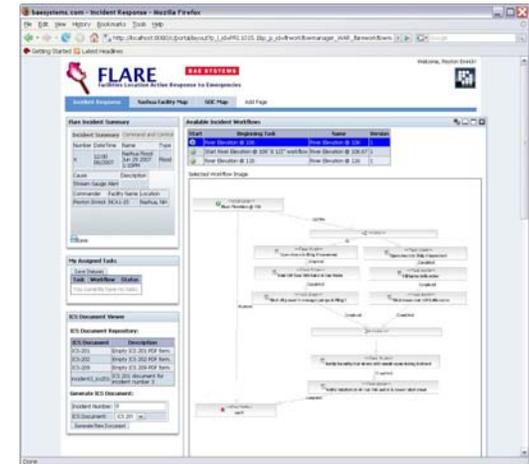
- Web-Based Portal Framework
 - Components can be added or removed from a user's experience
 - Component access can be controlled at various levels
 - Standards approach lends to straightforward incorporation
 - Legacy systems
 - New capabilities
 - Citrix NetScaler

- Removes the mystique behind GIS
 - Separates the complexity of GIS from the user experience
 - Detailed geospatial analysis become simple buttons or tabs
 - Easily integrates with ESRI's suite of products



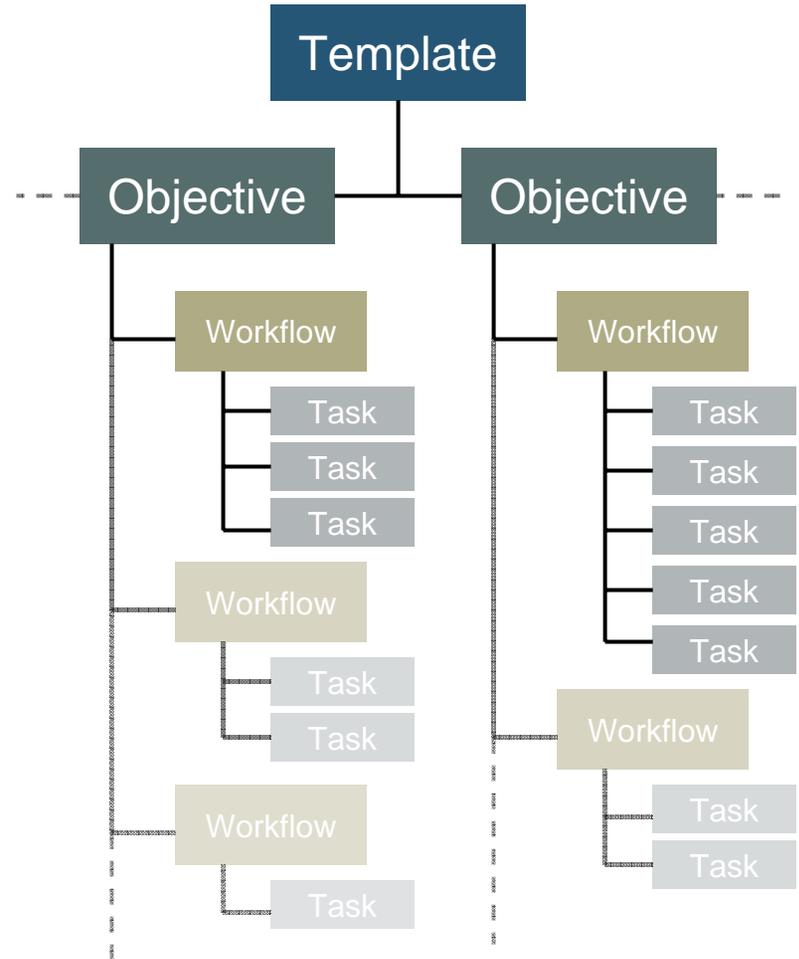
BAE Systems incidentOS

- Spatially enables your response plan
 - Response plans become Incident Templates
 - Incident Templates are the fabric of incidentOS
- Assists in emergency preparedness of site
 - Response and mitigation strategies brought to life
 - Easily incorporate site specific plans into incidentOS
- Visualize spatial relationships
 - Location of response and recovery efforts
 - Predictive modeling and analysis



Response Plans as Incident Templates

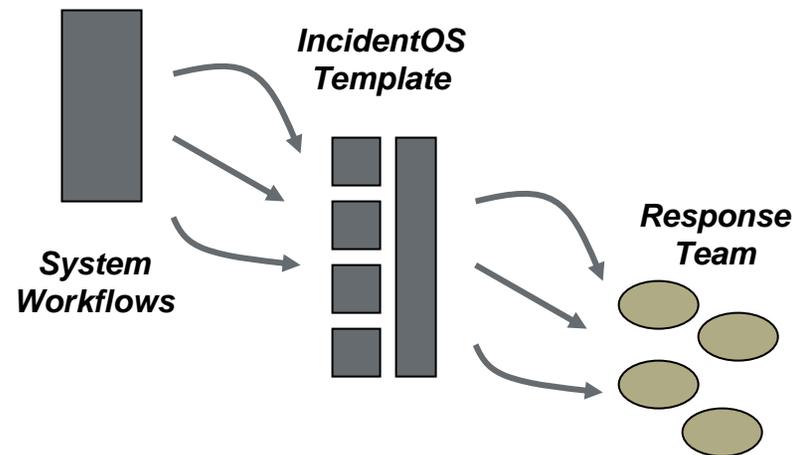
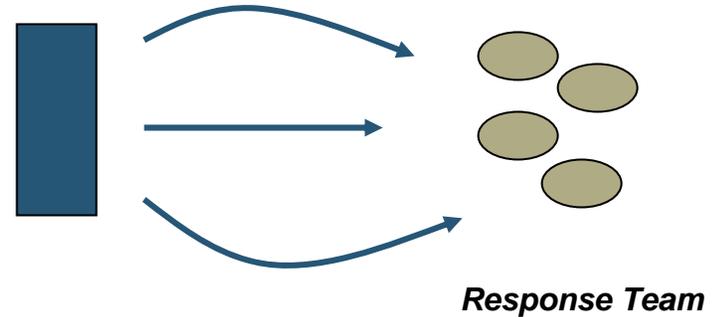
- Incident Template
 - Site specific predefined response plan
 - Developed for a specific incident type
 - Flood, Explosion, Intruder, etc.
- Objectives
 - High level goals of the response plan
 - Comprised of one or more workflows
- Workflows
 - More detailed checklists of the response plan
 - Comprised of one or more tasks
- Tasks
 - Individual task or checklist items
 - Assigned to a role or individual



Types of Predefined Response Management

- Two levels of system orchestration
 - Response Team
 - Decision Support
- Response Team
 - Site specific response plans
 - Relate plans to roles and users
 - Coordinate users to achieve goals
- Decision Support
 - Augment response team with system level workflows
 - Orchestrate application behavior
 - Adds an additional layer of control and automation

IncidentOS Template



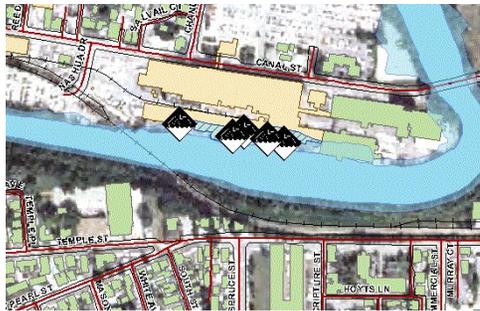
An incidentOS Template in Action

A facility's nearby stream gauges feeds are constantly monitored

Gauge Name	Status	Reading Date	Stage	Flow	CSM	Precipitation	Water Temp
Nashua River at East Pepperell	🔴	Aug 15, 2007	9.3	363.0	1.1	104.56	Unknown

When a flood warning is received, a flood incident template is started automatically.

The first task is to execute a geoprocessing model to predict flood water levels.



If the models predict a flood, the next task is to notify pre-defined personnel.



Once on-scene the Incident Commander starts emergency response plans and assigns roles to specific tasks.

Incident Response

Name	Description	Actions
Mothers Day Flood	The Merrimack River Overflows	🔍 🗑️
Nashua Flood Jun 29 2007 1:10PM		🔍 🗑️
Nashua Flood Jun 29 2007 1:10PM		🔍 🗑️

Response Summary
Incident Name: Nashua Flood Jun 29 2007 1:10PM

Objectives - Workflows - Tasks

- Flood Recovery
 - Flood Stage 1
 - River Elevation @ 106
 - Fill tanks with water
 - Notify Security that doors will remain open during incident
 - Notify employees down
 - River Elevation @ 106.67
 - Open doors in E
 - Open doors in E
 - River Elevation @ 106
 - Shut Off Rear N
 - Shut down rear
 - Shut off power to sewerage pumps in tank
 - Flood Stage 2
 - Flood Stage 3

Start	Beginning Task	Name	Version
🟢	Start River Elevation @ 106' @ 1/2" workflow	River Elevation @ 106.67	1
🟢	River Elevation @ 106	River Elevation @ 106	1
🟢	River Elevation @ 116	River Elevation @ 116	1

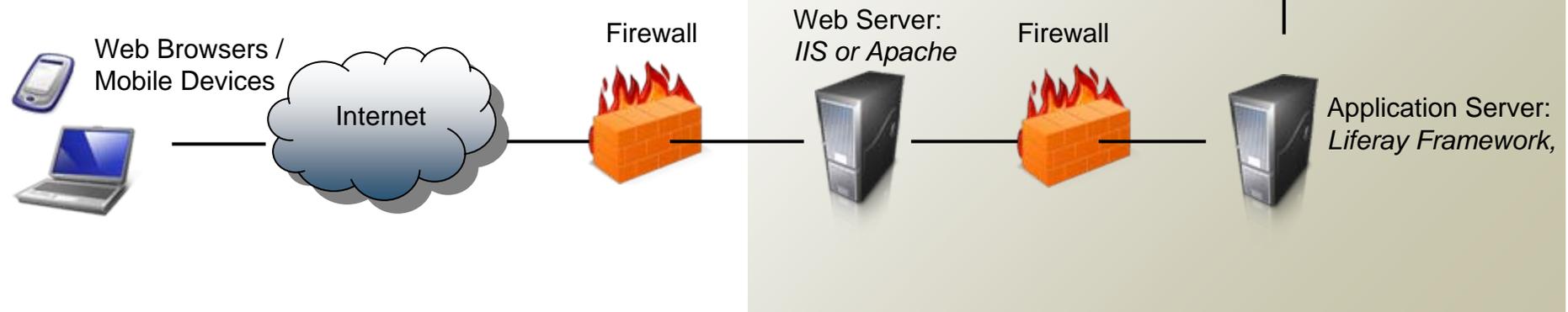
My Assigned Tasks

Task	Workflow	Status
River Elevation @ 116	River Elevation @ 116	In Progress

System Architecture

- Database Components
 - Spatial and non-spatial components
 - ArcGIS Server for Map and Geoprocessing Services
 - Support for SQL Server and Oracle

- Open Source Components
 - Liferay Portal Framework
 - ServiceMix ESB



Summary

- Provide crisis management teams with the specific information they need to:
 - Orchestrate all available resources
 - Protect people and property
 - Bring the value of GIS to incident command and emergency response
 - Removes the complexity of GIS from the everyday user
- incidentOS
 - Web based portal framework
 - Supports both hosted and turnkey solutions
 - User friendly, customizable interface
 - Spatially enables your response plans/workflows
 - Promotes preparedness of a location
 - Integrates current IT systems and investments
 - Combines GIS, web services, and open source components

Demonstration & Questions

