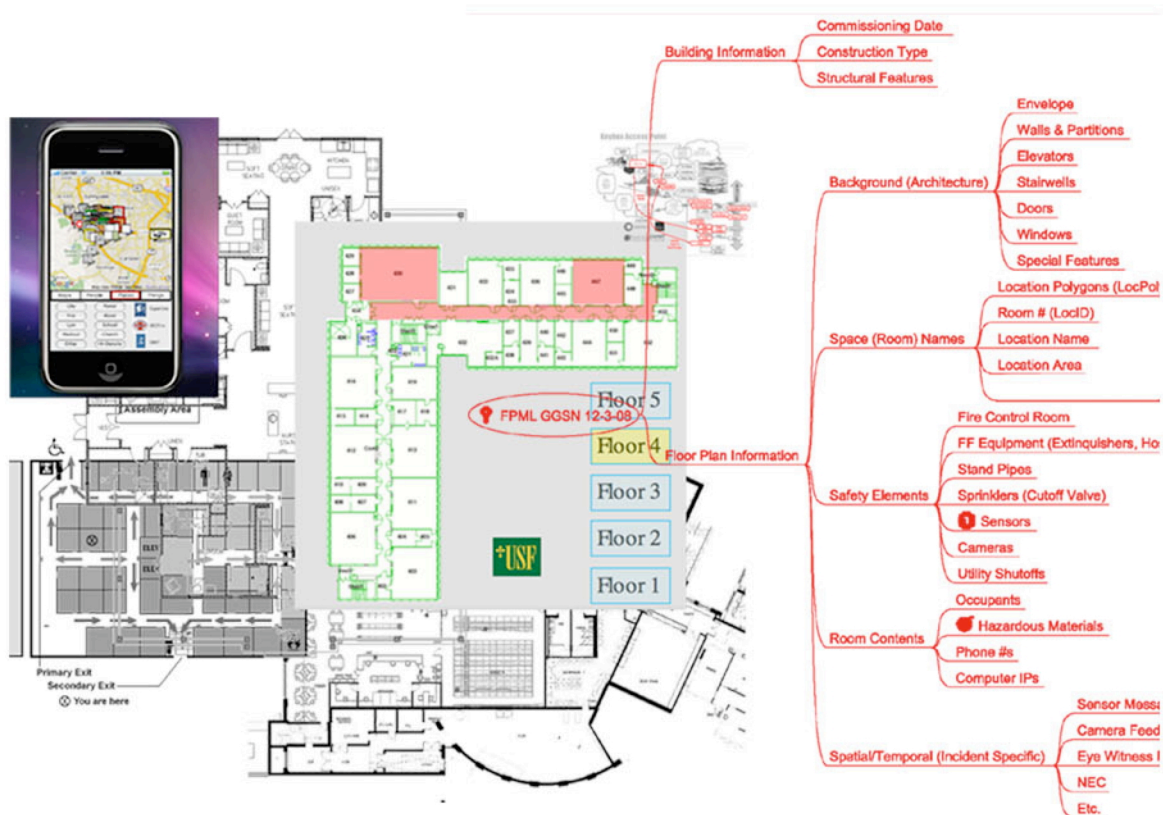# Seeking a Common Operating Picture for Emergency Response

A collaboration between MapLab, the Building Service Performance Project at Ontolog, and NIST National Institute of Standards and Technology Building Fire Research Lab.

Today, when there is an emergency requiring response from the fire department, police, or other public safety network, initial reports are typically received by phone. Responders go to a building they don't know anything about. Each building, emergency, and public safety service is different. Security systems are proprietary, conforming to very few standards.

The work proposed envisions a new generation 9-1-1 using modern devices and open exchange languages to depict buildings and alerts in simple, interoperable formats via lightweight web services. One objective is the ability to read and pass along sensor alerts before emergencies such as fires are large enough to be observed by a bystander phoning in.

Data identities center around building addresses, standard building data representations, and alert classifications. The aim is for software and servers to be certified by NIST to foster speaking the right languages (ex: XML, BACnet, CAP) between each building, jurisdiction, and security system (open or private) based on emergency communication needs. EDXL-DE Emergency Data Exchange Language Distribution Element is one routing mechanism that could be used. CAP Common Alerting Protocol is one kind of message content.

SAP Standard Access Points allow security vendors and responders with proper authorization at any point in the communication loop to plug into live building data, such as fire alarms, to enable strategic response and planning ahead of time. Building Owners submit drawings on a regular basis according to local regulations, for example New York City Local Law 26, or special requirements based on building type or occupancy. Existing buildings may be submitted as CAD files, BIM files, paper plans, jpg or pdf images.

Owner images are converted into SVG Scalable Vector Graphics to include only necessary and sufficient content. Clean drawings, terminology, and the actual buildings may be measured and inspected by many response levels ahead of time. Approved static drawings and models are converted to compact interoperable files, able to automatically connect to data fields generated and maintained by diverse organizations. Previously established relationships and permissions between data fields enable security vendors and emergency responders to overlay dynamic live building data onto static drawings in real time.

To work, the system needs to accommodate buildings and emergencies of every conceivable shape, size and style. Many supporting elements such as the IFC Industry Foundation Classes are works in progress. Semantic maps to similar classifications such as NIMS National Incident Management System, are missing or incomplete. Fortunately, only the access points and exchange languages need to be standardized while supporting work continues to be developed.

Common Operating Pictures enabled by new communication chains work backwards in time to register existing buildings, and forwards in time using BIM Building Information Models and GIS Geospatial Information Systems. A key objective sooner rather than later is the creation of an NBIMS National Building Information Modeling Standard MVD Model View Definition, with technical review by open standards organizations.

DMacP 12 08 08

References
Demo http://www.maplab.org/harney1/
Slides http://ontolog.cim3.net/file/work/BSP/ConferenceCall_2008-11-28/ DigitalKeybox5
Discussion http://ontolog.cim3.net/forum/bsp-forum/2008-12/threads.html

Sample CAP Alert type "Smoke":

```
<?xml version="1.0" encoding="UTF-8"?>
<alert xmlns="urn:oasis:names:tc:emergency:cap:1.1">
 <identifier>1179353147004</identifier>
 <sender>https://p623572.campus.nist.gov:8443/bisacs</sender>
 <sent>2007-05-16T18:05:47-04:00</sent>
 <status>Exercise</status>
 <msgType>Alert</msgType>
 <source>alarm1bundle.sensor01</source>
 <scope>Public</scope>
 <info>
  <category>Env</category>
  <category>Fire</category>
  <category>Health</category>
  <category>Rescue</category>
  <category>Safety</category>
  <category>Security</category>
  <event>Smoke</event>
<expires>2007-05-16T18:06:47-04:00</expires>
   <description>Smoke detector, building 226, 3rd floor, room B346. Smoke alert</description>
```