www.i4es.it - www.jixel.eu

IES Solutions

IES Solutions – www.i4es.it - www.jixel.eu

Introduction to JIXEL

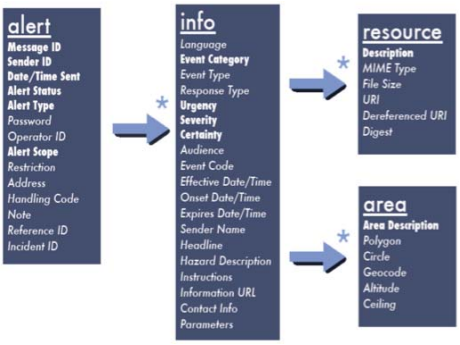
JIXEL is a suite of a web based applications, that allows emergency services (fire and rescue, ambulances, police, civil protection) to seamlessly exchange information during day by day operations and when managing catastrophic events and their aftermath

Speed, coordination and transfer of information across Emergency Services are key in providing effective reaction and response to an incident. Having a common view on what is really going on makes the difference in managing day-by-day incidents or large events that may rapidly require the involvement of several rescue teams. Control rooms need to work in combination and often to cooperate on the same events. Control rooms managing emergency services with different specialisation (e.g. fire and rescue or ambulances) and/or covering different geographical areas need to (i) have available a common dataset, (ii) rapidly interoperate on it and (iii) share a collaborative view on the same geography.

JIXEL has implemented a novel methodology that allows control rooms to seamlessly share data in electronic format. These data include the incident location, type, urgency, and severity, along with brief information on the resources dispatched for a specific incident. Attachments (e.g. pictures) can also be included in the exchanged messages. **The results is a peered collaborative map**. JIXEL is a web 2.0 service that can be run from www.jixel.eu or can be installed at each Emergency Center.

CAP Protocol

JIXEL uses the Common Alerting Protocol (CAP) to exchange messages between Emergency Services



What is CAP

CAP is the standard XML data format JIXEL uses to manage information about incident location and other relevant data: http://tinyurl.com/CAPProtocol

It contains an alert block with generic incident information, multiple info blocks with multilingual detailed information, multiple resource blocks for attach ing multimedia content and multiple area blocks to define the geographic features.

How JIXEL works

JIXEL pills

What is a *jixel*

A *jixel* (or jigsaw element) is a piece of information (an incident or a feature) that users want to share. Information are displayed on a collaborative map, just like a jigsaw puzzle is built by many tiles.

JIXEL ATOM Feeds

JIXEL makes available secure, encrypted and personalized ATOM feeds for each partner organization. Those feeds are the mechanism used for data exchange. More info on ATOM feed is available here: http://www.atomenabled.org/

CAP as Data Structure

Data structure alone is important but not everything. You need to understand the way other Emergency Services classify incidents. A correspondence map between such codes and the JIXEL codes has to be built. CAP is very powerful in doing this and, in addition, JIXEL makes use of TSO data dictionary.

TSO as Data Dictionary

TSO is a Dictionary of Terms describing incident types in different languages. More info on TSO: http://www.tacticalsituationobject.org

JIXEL compliant with National standards

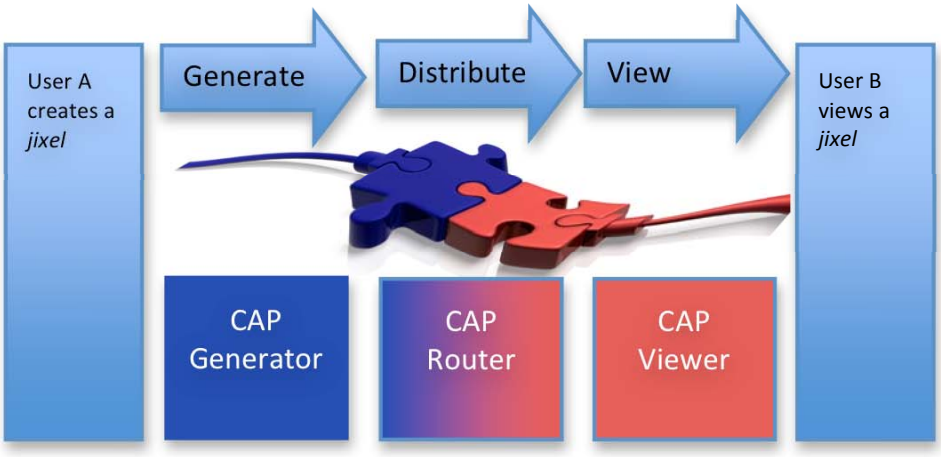
JIXEL is fully compliant with the interoperability standard adopted by the Italian National Fire Department (Ministry of Interior) with the Decree dated 17 June 2008

JIXEL Components

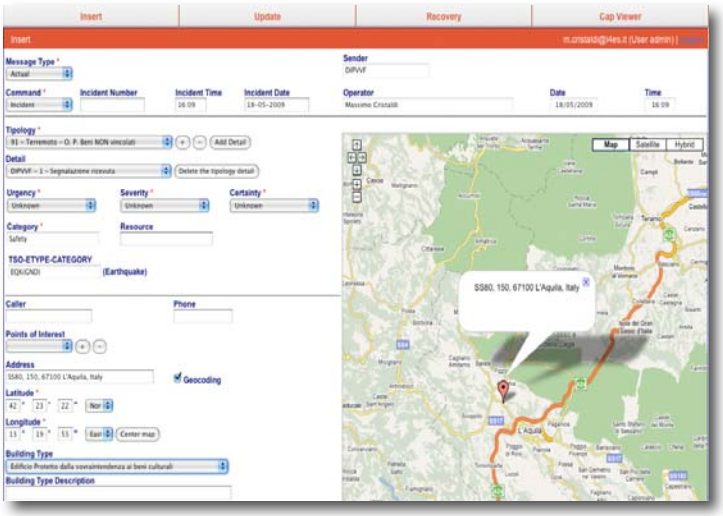
JIXEL is made of three different components: the CAPGenerator, the CAPRouter and the CAPViewer.

- The JIXEL CAPGenerator is a Web interface that allows users to create and share information. By using it, it is possible to assign a geographical coordinate (lat/lon) to a CAP message (from now on a *jixel*) and add many other information (e.g. incident of feature description resource, attachments). Once created, the *jixel* is ready to be handled by the CAPRouter.
- The JIXEL CAPRouter is a web service that distributes *jixel* to the partner organizations they are targeted to. Users can configure the recipients of a specific *jixel* according to its features and based on this the CAPRouter creates a dedicated, secure and encrypted *jixel feed* for each of them. Such *jixel feeds* can be textually displayed using a standard browser or on a map running the last JIXEL component: the CAPViewer.
- The JIXEL CAPViewer is able to display, filter and group on a geographical interface the *jixels* distributed by the CAPRouter. Similarly to the CAPGenerator it uses Google Maps to show the features on a map.

All the JIXEL components can be accessed through a secure web interface using standard browsers.



JIXEL for the L'Aquila Earthquake: REVENGE



JIXEL CAPGenerator – How it has being used during the L'Aquila Earthquake

A recent application of Jixel is the exchange of information between Search and Rescue (SAR) teams in Abruzzo (Italy). On 6th April 2009, an earthquake stroke, killing 299 people and damaging or destroying thousands of houses and buildings. Immediately after the disaster occurred, SAR teams started to gather in the area and activities were coordinated by the Italian Civil Protection. As usual, SAR teams from Italian "Vigili del Fuoco" (CNVVF) have been heavily involved, with 2300 firemen and 116 teams operating on a large area and organised in a central headquarter and 7 local headquarters.

A quick and reliable way of keeping track of the on-site activities was set-up by CNVVF and IES using JIXEL as underlying technology. A large number of actions were geolocated and tracked down during the first days after the earthquake.

This JIXEL deployment has been named REVENGE (*Rete Virtuale tra Enti per la Gestione delle Emergenze – Virtual Network between Services for Emergency Management*). The description of the intervention (including typology, location, brief description, urgency, severity and relevant information for all SAR teams) were input using the JIXEL CAPgenerator interface.

JIXEL CAPGenerator – Its use in the aftermath of the L'Aquila Earthquake

As soon as the urgent SAR activities had ended, the focus of the rescue teams became the assessment of houses and building conditions. The immediate goal was to allow citizens to safely return to their homes and to identify any urgent restoring activities that may reduce risks and protect historical building during the after-shock seismic swarm. Again, teams from CNVVF are playing a major role, in combination with engineers and technicians from other Public Authorities.

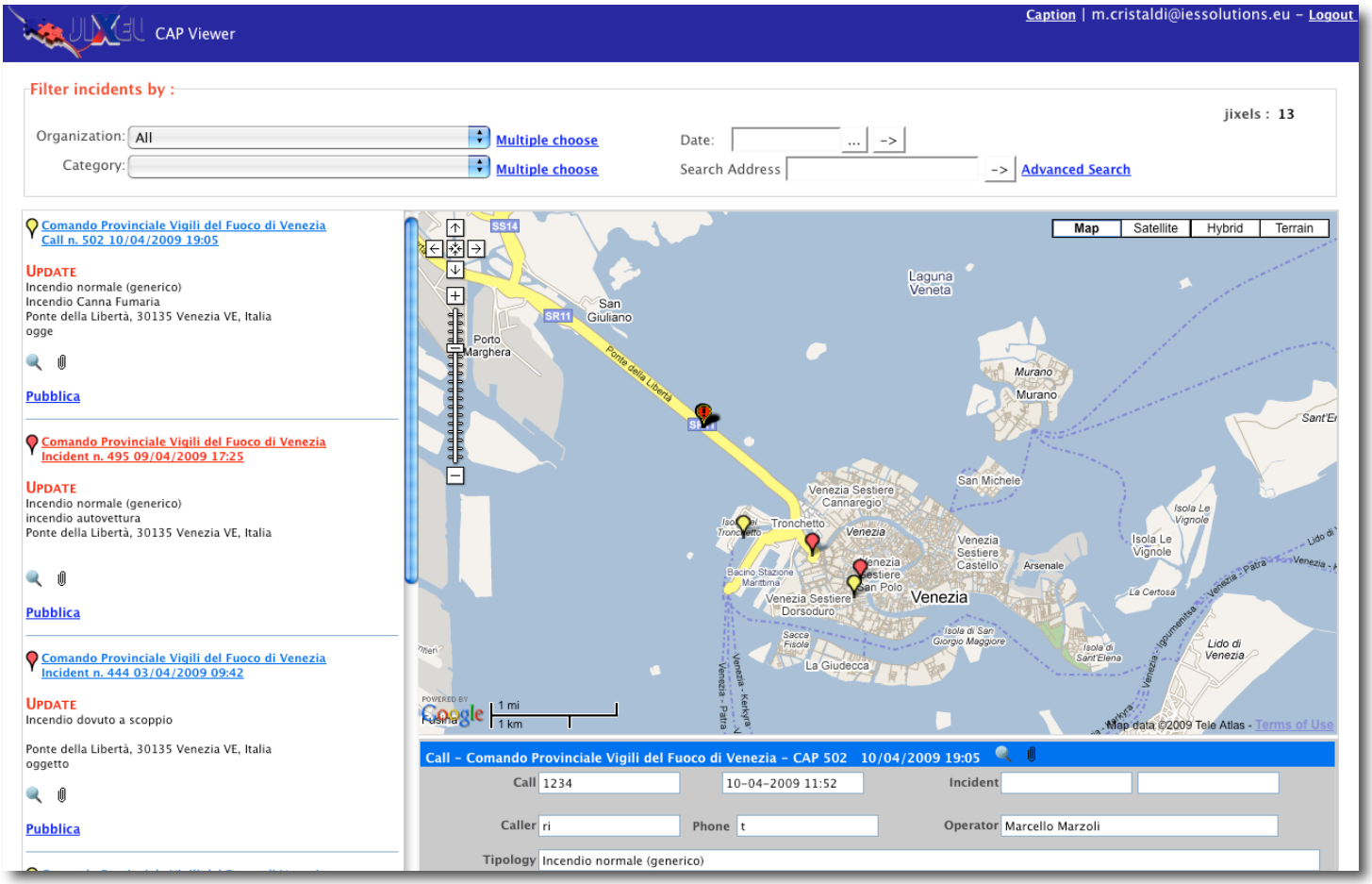
A noticeable cooperation was established with the Italian Ministry for Arts and Cultural Heritage (MIBAC) for the conditions assessment and monitoring of historical buildings (e.g. churches or medieval castles).

JIXEL offered another flexible and effective solution to the challenge of having different teams, with different priorities and technical procedures, to cooperate and quickly share a geographical view of the building to be monitored and of the on-going results of the on-site activities.

Hundreds of historical buildings were geolocated and actions assigned and monitored, also allowing the generation of statistical reports. Description of the buildings (including typology, location, brief description, actual conditions and relevant information for the teams e.g. pictures) were input using the JIXEL CAPgenerator interface.

All information created using the CAPGenerator interface can be accessed by the intended recipients and displayed on the CAPViewer geographical interface.

JIXEL CAPViewer



JIXEL CAPViewer

With a combination of map view, synthetic textual presentation and full-details presentation, CAPViewer allows users to have an overview of the evolution of the situation in a selected area, as well as to access detailed information for further planning. Users may filter information according to several criteria, search a given location, be updated in real time with messages coming from other SAR teams. This way, vital information can be quickly retrieved and used.

Underlying technologies

JIXEL is based on:

- Linux Server (Debian/Ubuntu)
- MySQL Databases
- Cake PHP
- Apache WebServer
- Tomcat Web Server
- Java 1.6
- Google Maps
- CAP Protocol
- TSO data dictionary
- ATOM Geo feed

For more information please contact:

IES Solutions Srl
Via Monte Senario 98
00141 – ROMA (ITALY)
Dr. Uberto Delprato – 0039-348-3432153 or Dr. Massimo Cristaldi – 0039-095-211640

You can request a trial of JIXEL contacting us at www.i4es.it or www.jixel.eu