Interoperability for the L'Aquila earthquake

The JIXEL technology applied for the implementation of a Virtual Network between Services for Emergency Management

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Interoperability: why

Speed, coordination and transfer of information across Emergency Services are key in providing effective reaction and response to incidents and disasters

Control rooms managing emergency services with different specialisation (e.g. fire and rescue or ambulances) and/or covering different geographical areas need to

1.have available a common dataset

2.rapidly interoperate on it and

3.share a collaborative view on the same geography.

CAP and TSO adopted by Italian Fire Brigades

- The Italian Ministry of the Interior has issued a formal decree concerning the sharing of data between the fire department and other emergency organisations, such as the ambulance service.
- The decree – published in the government's Official Journal of 3 July – defines the communication protocols for exchanging data and information between emergency service command and control rooms.
- This is the first time in Italy that an emergency organisation will open its databases to other similar organisations, providing they adopt the communication protocol which has been defined and developed within the REACT project.

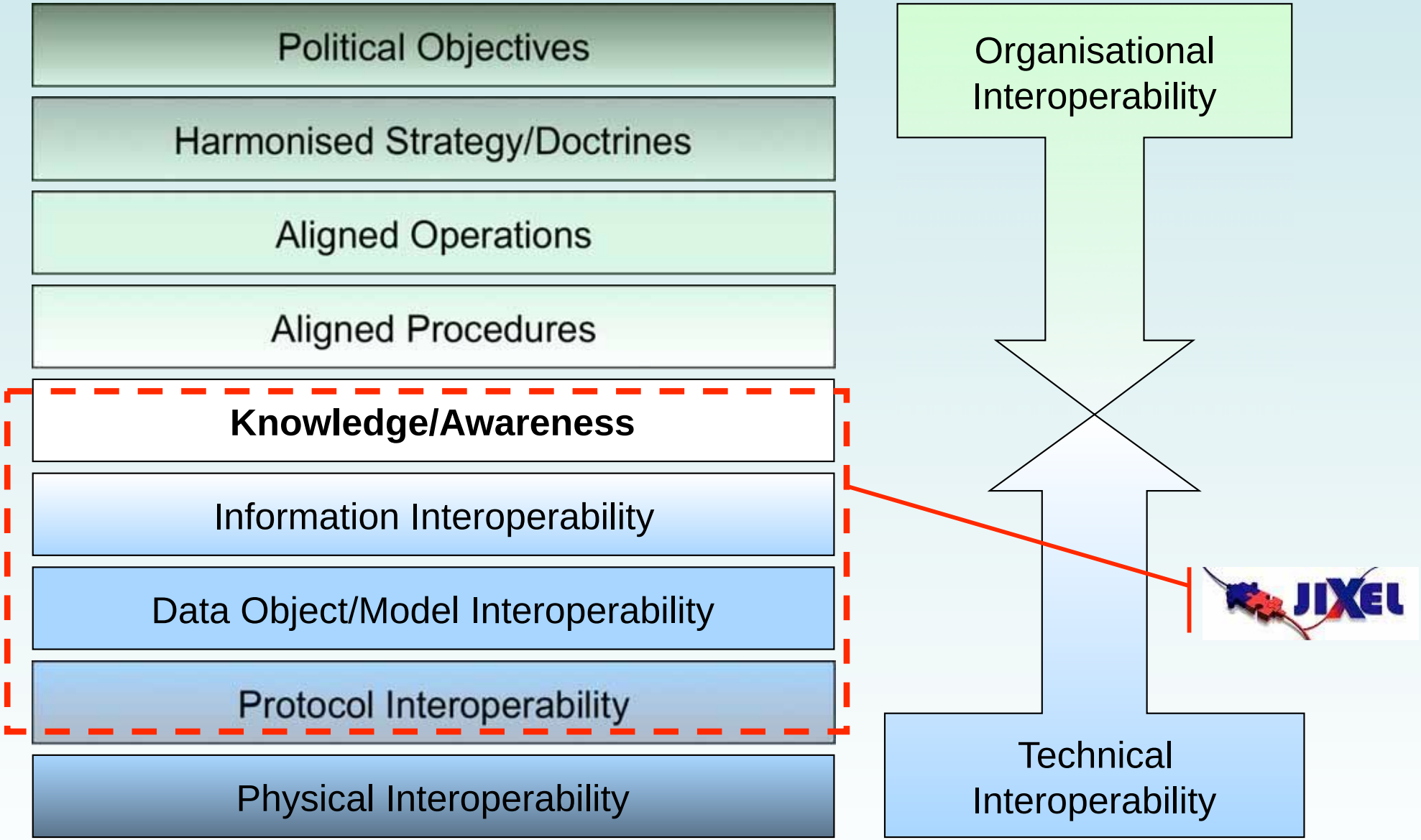
Every message is a part of a shared collaborative map that is being continuously built up as a jigsaw puzzle

Between 2006 and 2009, CNVVF and IES Solutions have been developing a prototype of an interoperable system based on CAP and TSO. Such development, co- financed by the European Commission, ended up with a long trial phase in Venice. Other Fire departments from Treviso, Aosta and Bolzano wer also involved.

Every message is a part of a shared collaborative map that is being continuously built up as a jigsaw puzzle

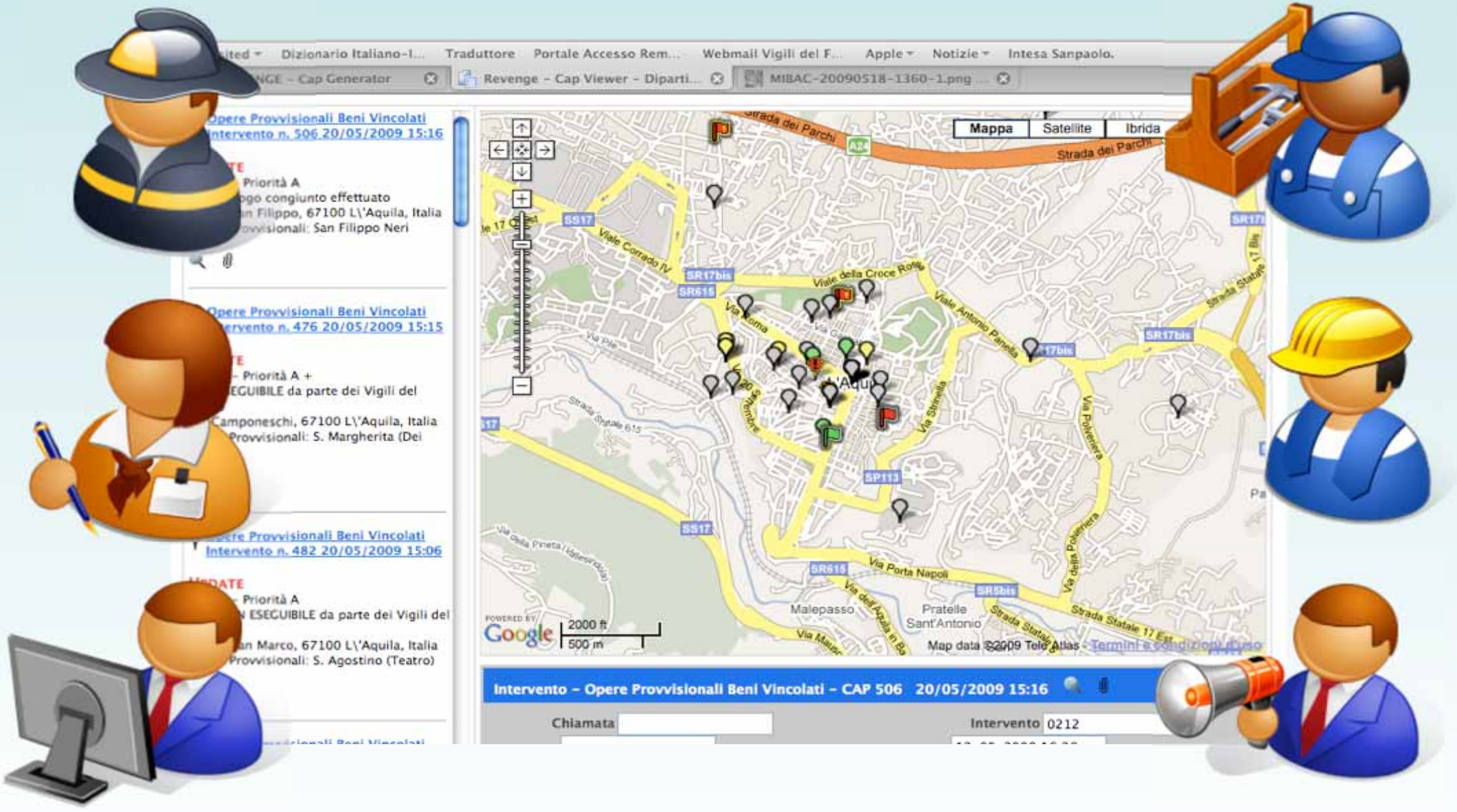
JIXEL is a suite of a web based applications, that allows emergency services (fire and rescue, ambulances, police, civil protection) to seamlessly exchange information during day by day operations and when managing catastrophic events and their aftermath

Interoperability layers



From observation and planning...

... to a collaborative Map



Each piece of information is...

… a contribution to a better understanding of the situation

... a message built according to the CAP standard

… a **JIGSaw El**ement

i.e. a **jixel**

How a jixel is structured

- The structure is compliant to the **Common Alerting Protocol (CAP)** data format
- The description of the alert is a combination of the fields available in the CAP structure and the entries of the **TSO (Tactical Situation Object).** They can be expanded without any problems to the structure of the message

What is CAP

Common Alerting Protocol (CAP) is an OPEN data format (i.e. it is not a proprietary standard) used for to manage information about incident location and other relevant data: http://tinyurl.com/CAPProtocol

CAP is a flexible stracture, fully compatible with:

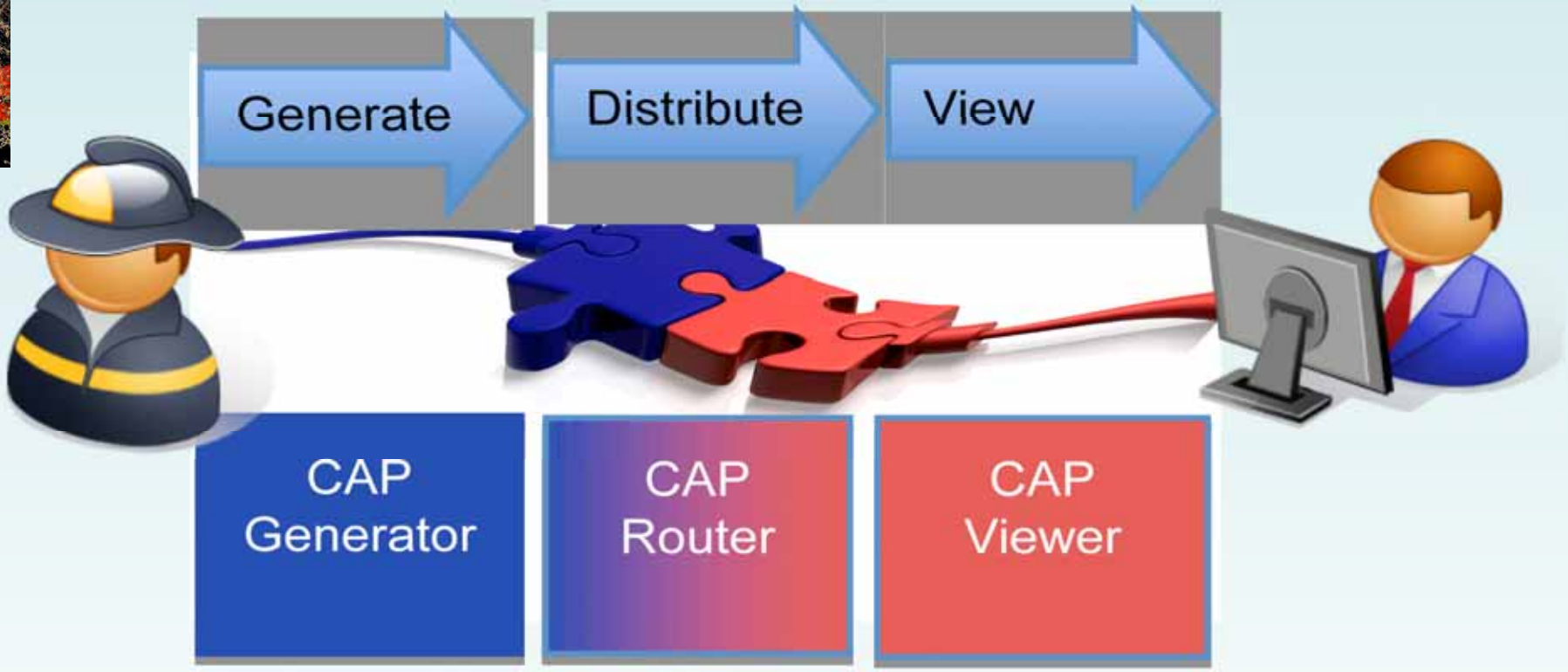
- Direct connection to a variety of sensors and devices
- Data exchange between Emergency Services
- Publication of information to citizens

It can be enriched with encryption and other security tools

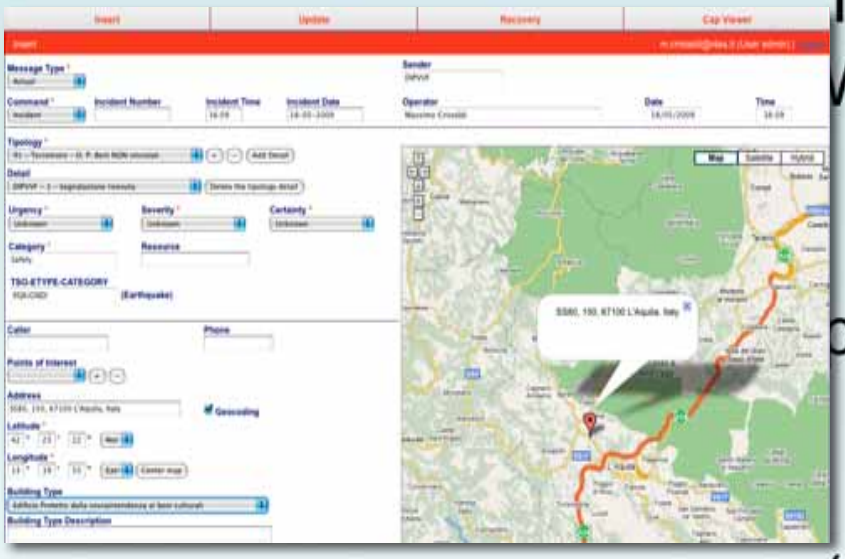
What is TSO

- 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 (Tactical Situation Object)** data dictionary
- TSO is a Dictionary of Terms describing incident types in different languages. More info on TSO: http://www.tacticalsituationobject.org

JIXEL Components

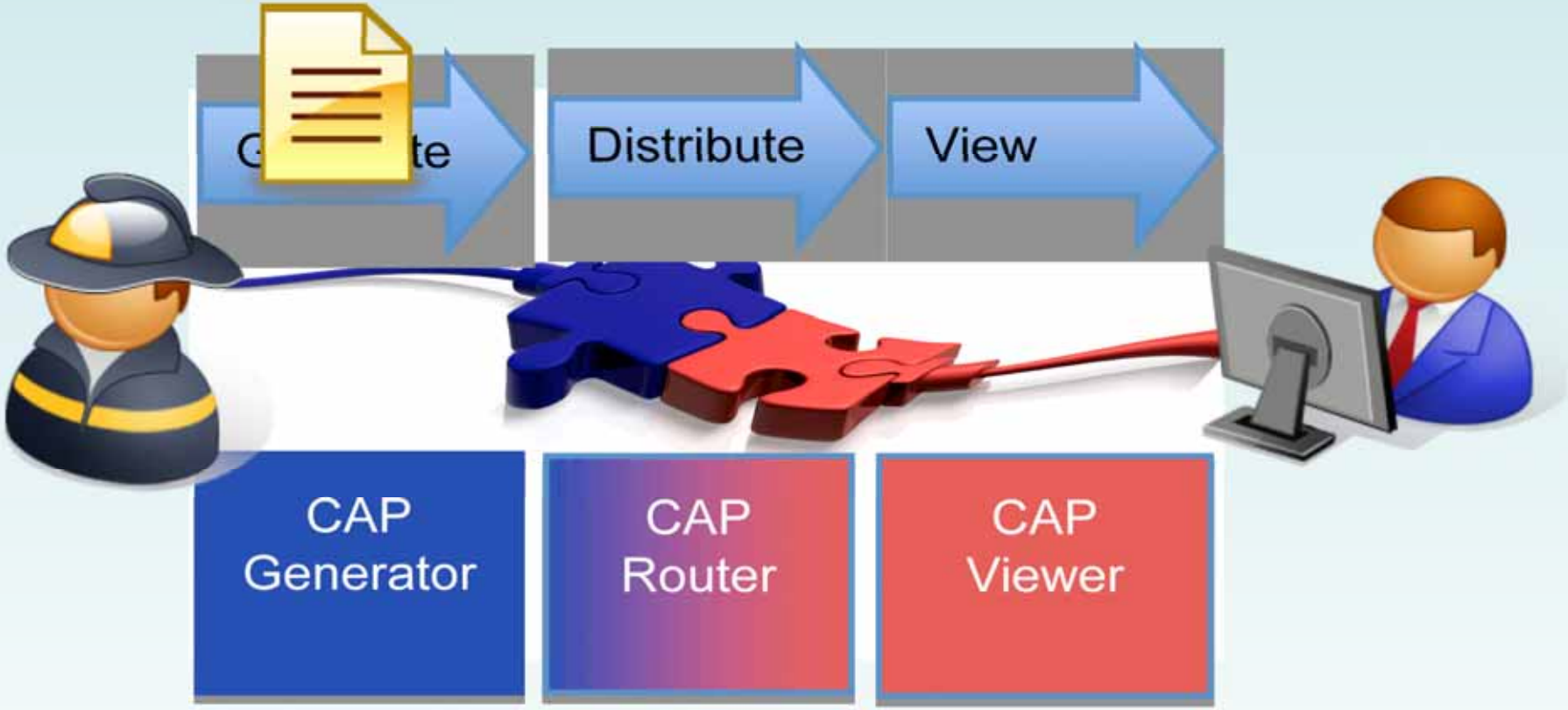


The CAP Generator



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.

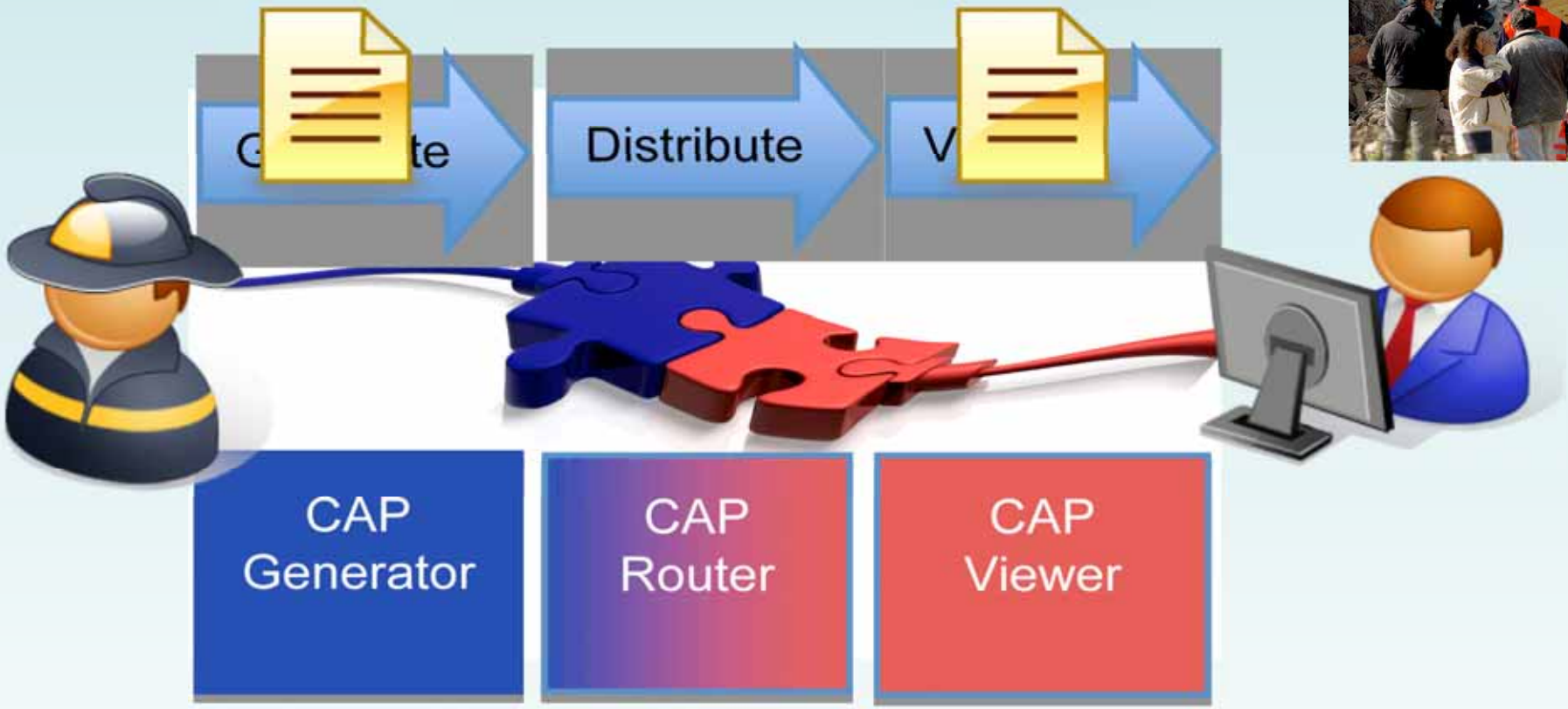
JIXEL Components



Il CAP Router

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.

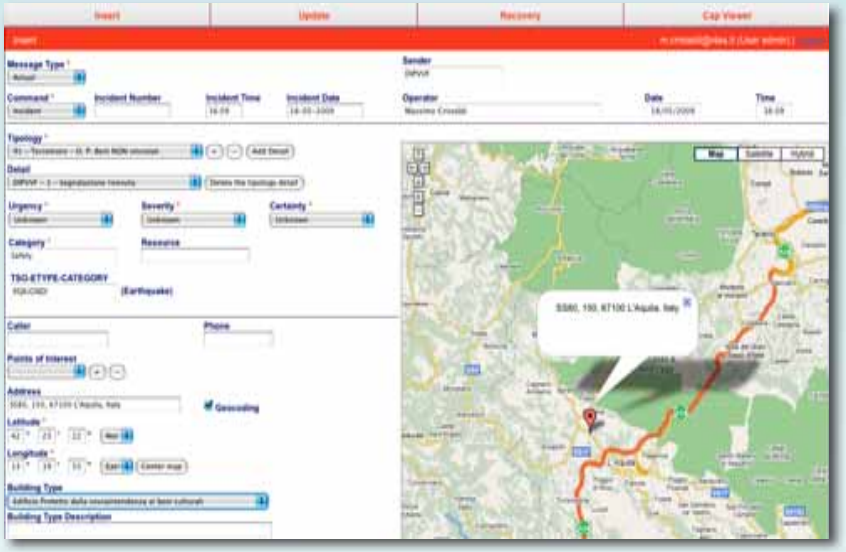
JIXEL Components



Il CAP Viewer

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.

JIXEL for L'Aquila = REVENGE



From the EC project REACT to the REVENGE trials

Adaptations and customisations

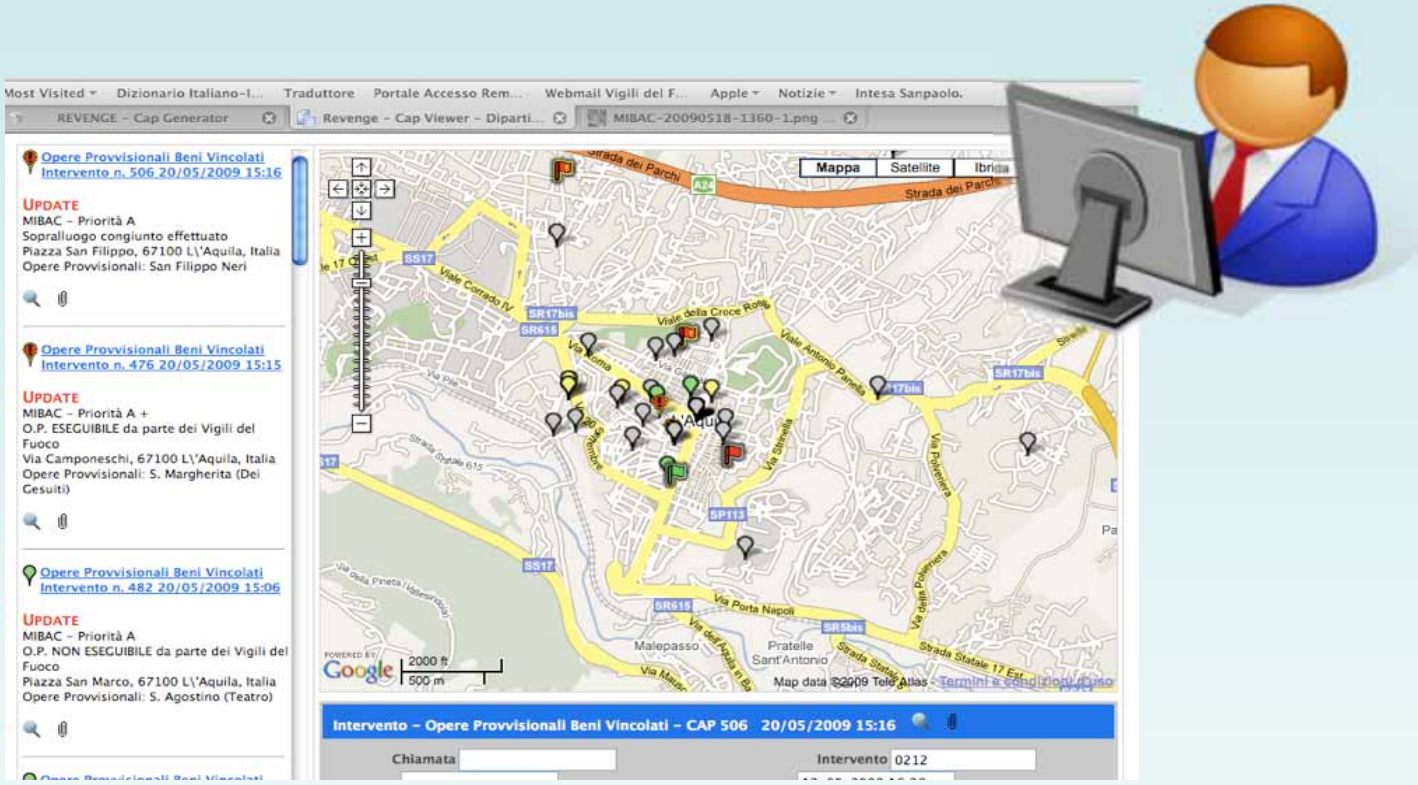
Limitations in bandwidth and access to the internet

Import of data prepared off-line, with delayed geocoding

REVENGE for first responders

Team 1

Team 2



The “basic” application of REVENGE

Tracking and log of interventions.

Chief Officer may access data remotely

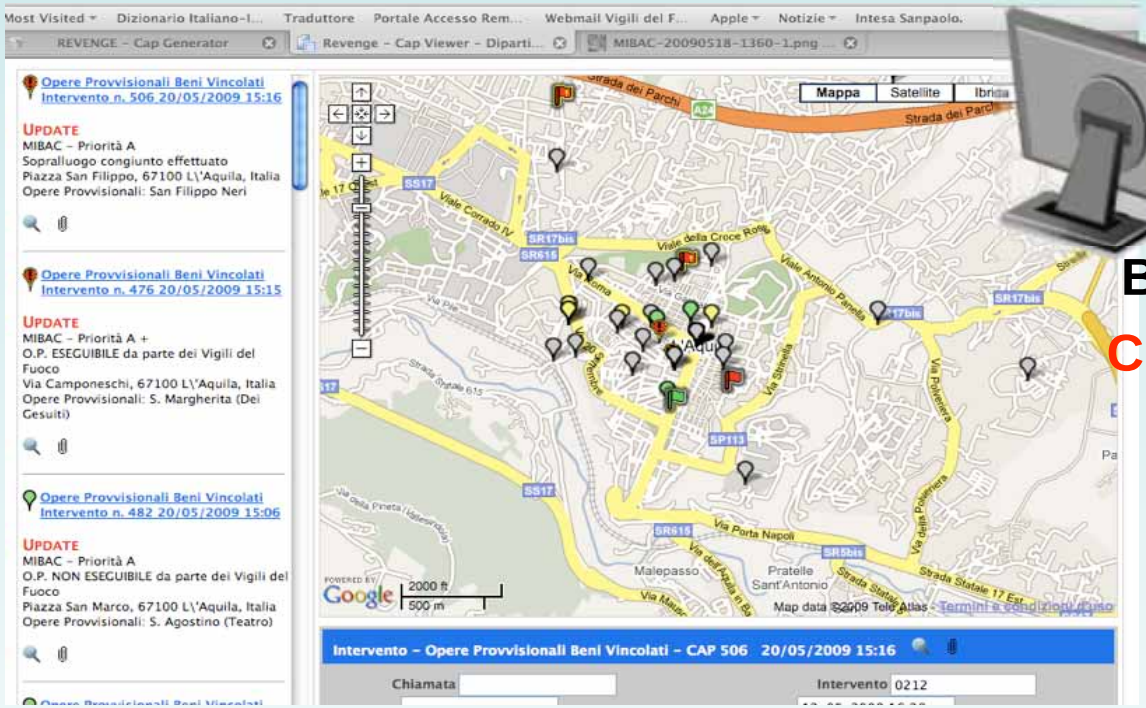
REVENGE for statistics (base camps)

Team 1

Base Camp X

Team 2

Base Camp Y



Base Camp

Chief Officer

A lightweight Control Room for the input of data on activities.

Also possible off-line (with limitations)

Production of statistical reports

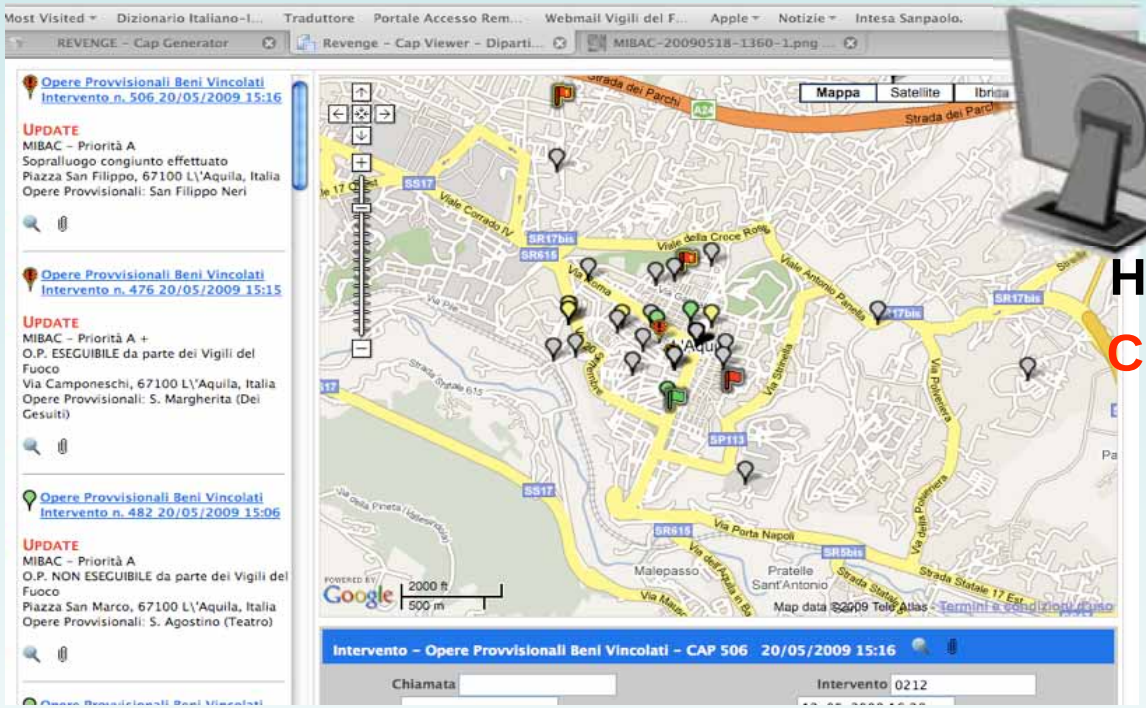
REVENGE for statistics (first assessments)

Team 1

Base Camp X

Team 2

Base Camp Y



Headquarter

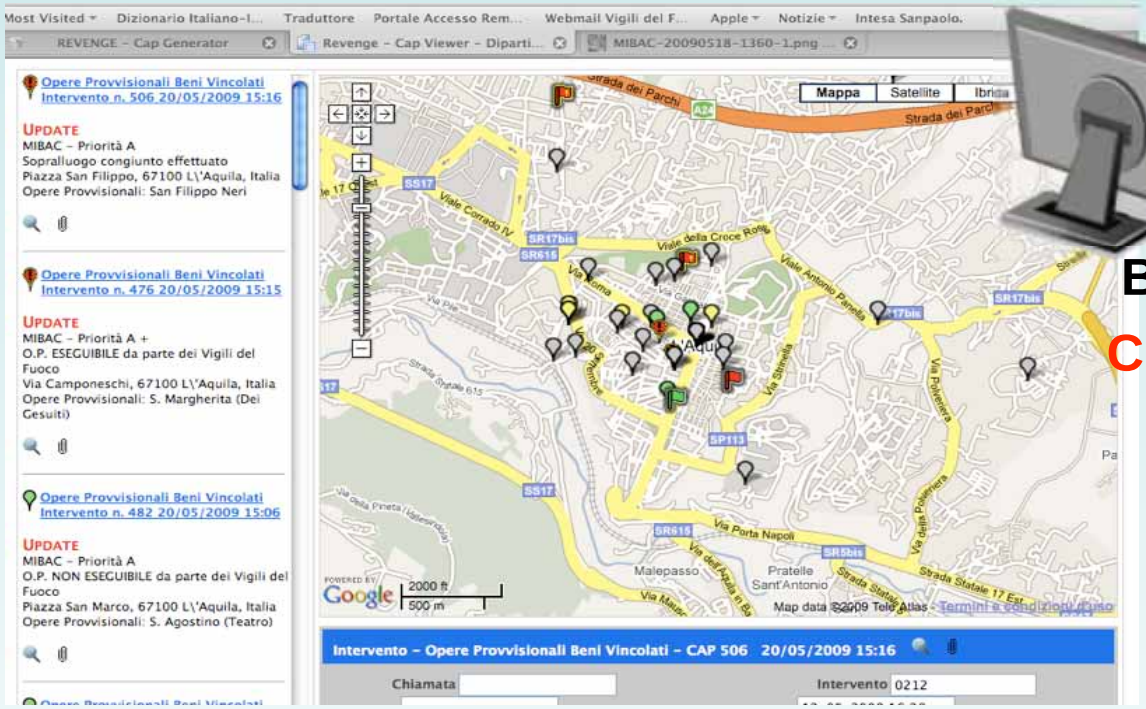
Chief Officer

Tracking and log of first assessment of the conditions of building and infrastructures

Production of statistical reports

REVENGE for CNVVF interventions on buildings

Team 1



Base Camp

Chief Officer

Team 2

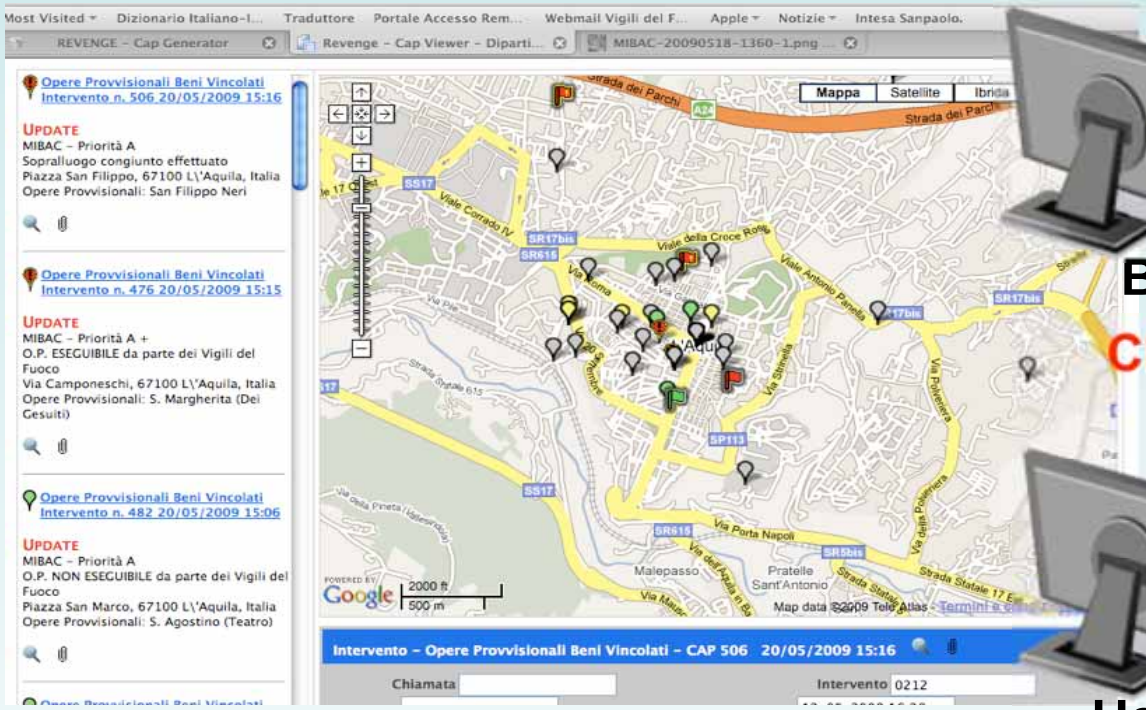
Tracking and log of restoring activities on building and infrastructures

Production of statistical reports

REVENGE for CNVVF and MIBAC interventions on valuable buildings

Team 1

Team 2



Base Camp

Chief Officer

Headquarter

MIBAC Officer

Tracking and log of restoring activities on historical building.

Interoperability CNVVF - MIBAC

Production of statistical reports

Information flow (1)

DICOMAC - main command and control room

DECISION MAKING:

The sharing of information allows decision makers to shorten the time to react and to quickly set the priority list of jobs to be done

Information flow (2)

a joint team assessing the state of damage of an historical building in l'Aquila

ASSESSMENT OF THE SCENARIO:

the distributed data entry gives to assessing teams the possibility of recording all the information directly - such information are immediately available to the different structures

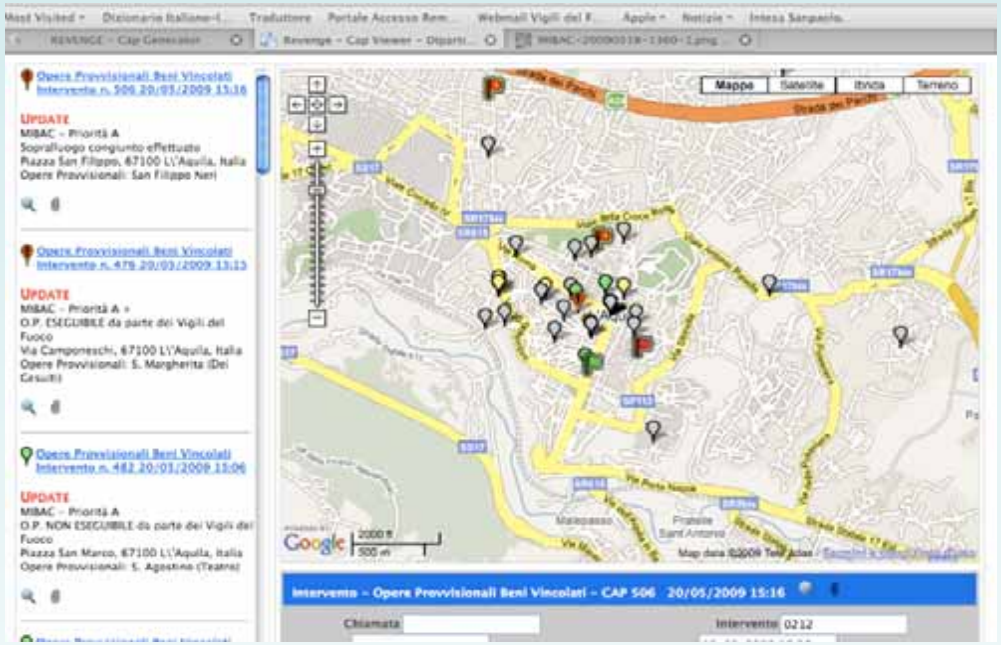
Information flow (3)

The web based structure makes data management and fruition extremely flexible

ELABORATING PROVISIONAL WORKS:

In this phase the remote data entry gives to assessing teams the possibility of recording all the information directly - such information are immediately available to the different structures

Information flow (4)

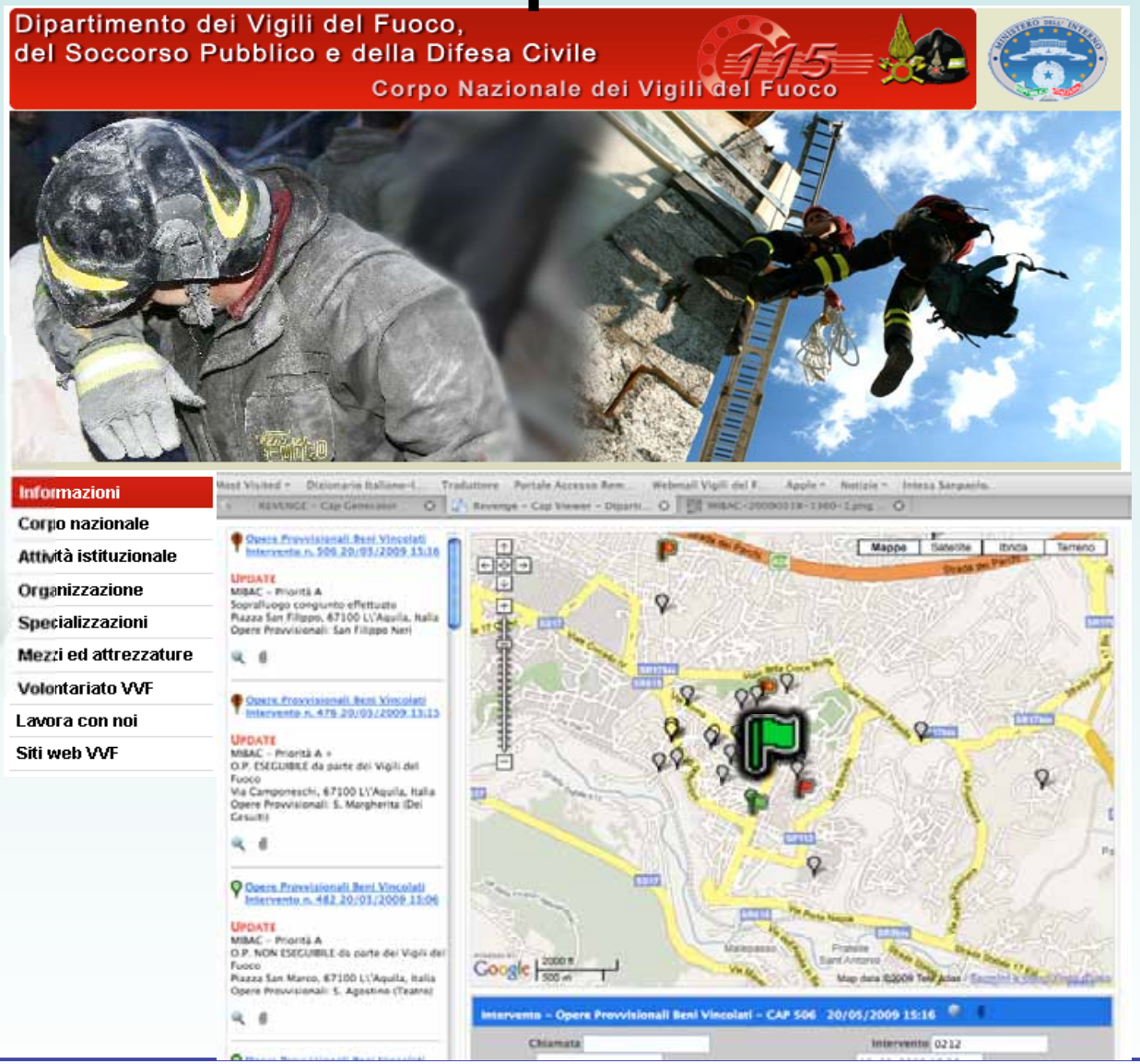


web page showing sites interested by emergency activities

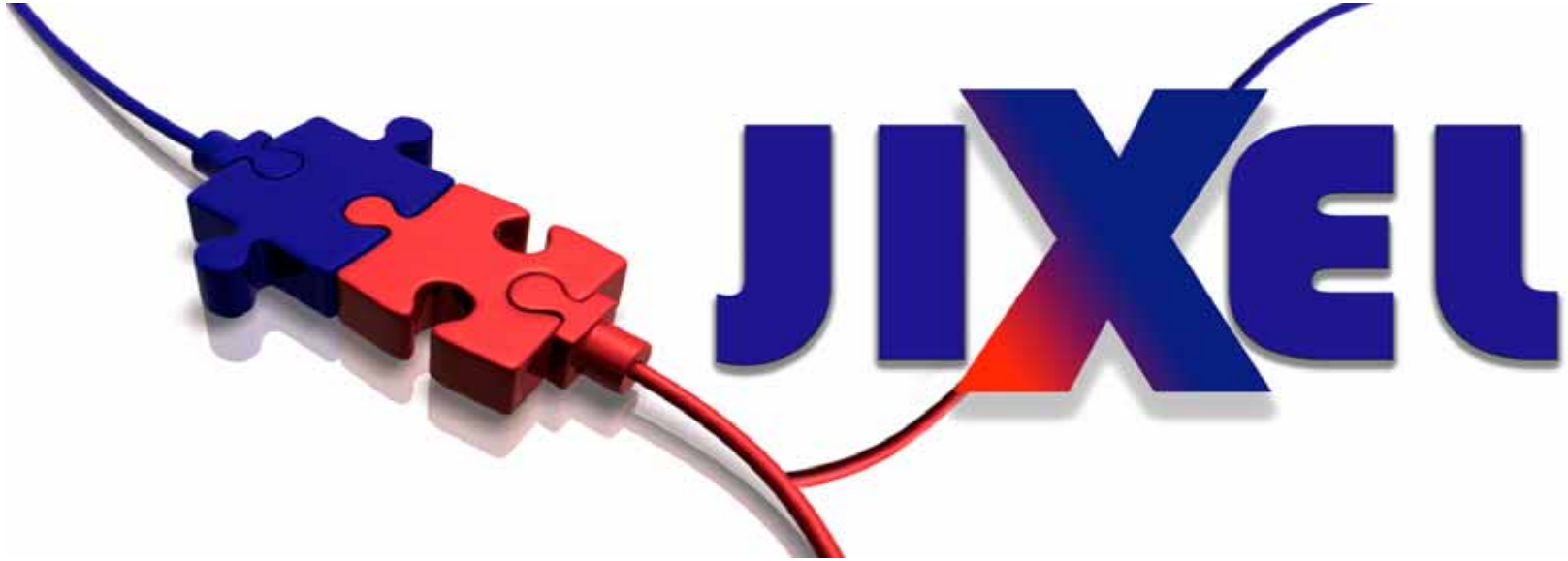
SHARING INFORMATION:

the interoperability objective is reached - data are shared during the workflow and at the end of the process

REVENGE for delivering information to the public



Every single message contributes to a better understanding of the scene



JIXEL is a suite of a web based applications, that allows emergency services to exchange information rapidly and efficiently

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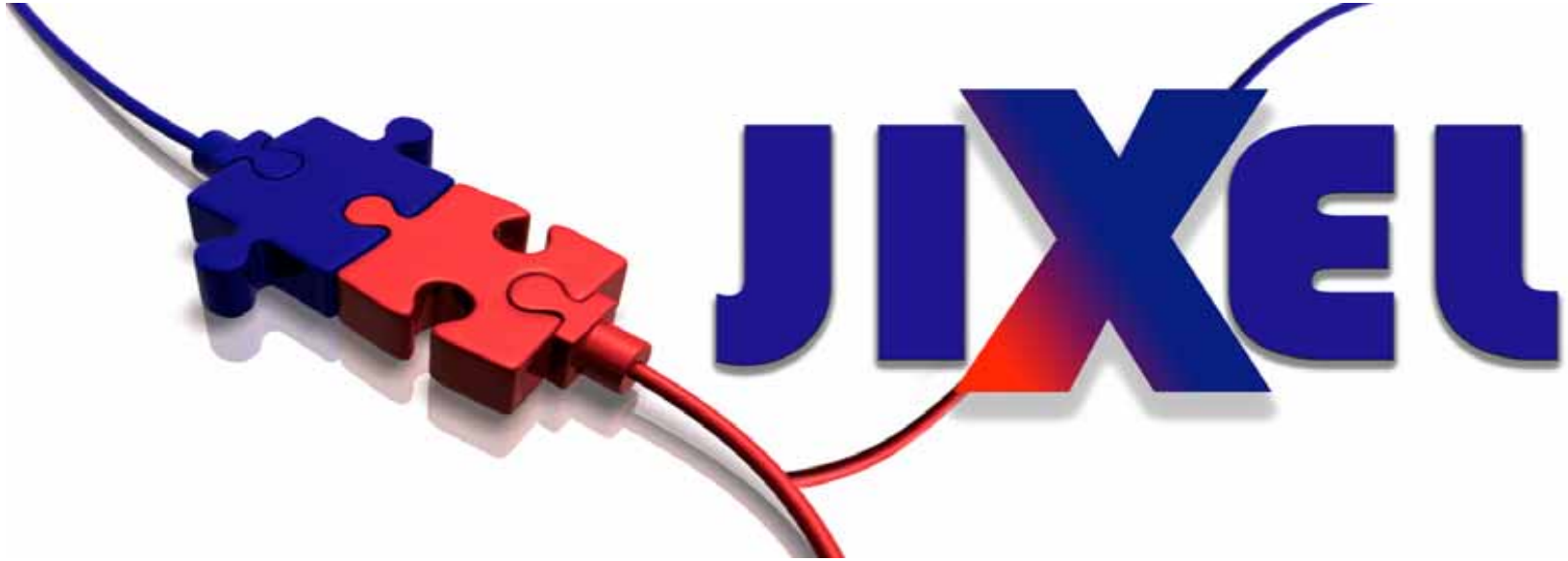

JIXEL can be configured to best support the sharing of information in specific situations (emergency, planning, monitoring)

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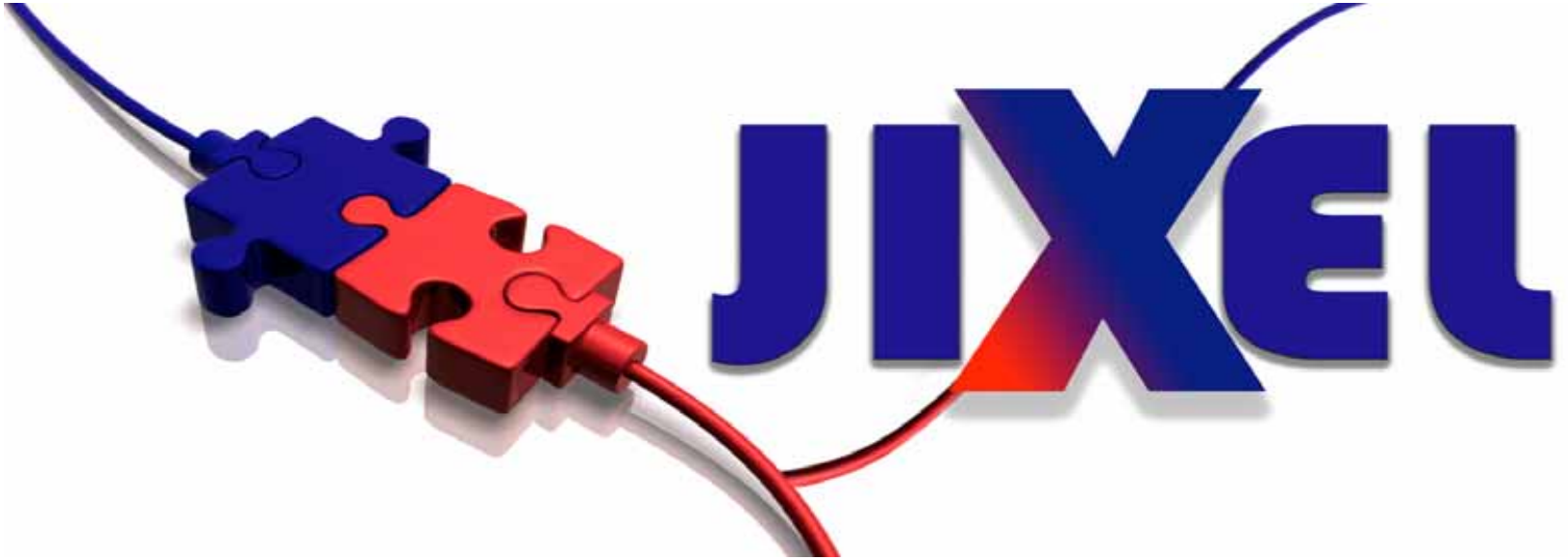

Please contact us at

www.i4es.it or www.jixel.eu

for a demo or a free trial

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