



Collaborative Networks and Crisis Management

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EQUIPE PROJET

Coast

CENTRE Inria

Nancy Grand Est

Coast Team

- Inria/LORIA research team (15/20 people)
- University of Lorraine
- Research topic :
- Web Scale trustworthy collaborative systems

- Teams.inria.fr/coast
- @InriaLORIANCoast



Inria NANCY
Grand Est



Goals of the presentation

- Shows how Crisis management response organisation relates to a collaborative network
- Shows how p2p can be leverage to support large scale collaboration
- Introduces a new partner : the crowd

Disaster and Crisis management

- Definition (Red Cross)
 - *Disaster Management* can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters.

Disaster management phases



<http://www.ifrc.org/en/what-we-do/disaster-management/about-disaster-management/>

Emergency management organisation

- Multi-organisational :
 - Security organisations,
 - Health care organisation,
 - Safety organisations,
 - mayors,
- Centralised coordination
- Hierarchical

When the scale increases

- Across borders
- Across organisations
- Across cultures
- Across interests
- Always cluttered by
 - Political and legal issues
 - Limited resources
 - Interoperability issues
- Current approach
 - Collaborative
 - Decentralized
 - Based on Trust

Network partners



- Traditional actors
 - Police,
 - Firefighters,
 - Healthcare, Hospitals,
 - Civil Security,
 - Military,
 - Red Cross,
 - Local Civil servants...
- Ad-Hoc actors
 - Industry worker,
 - transportation workers
 - Other GNOs

Network building

- During the preparedness phase
 - Training and exercise
 - Interpersonal network construction
- Not easy to prepare to the unexpected

Variation in crisis

- Crisis management is an evolving matter
- Recent crisis have obliged to revise the preconceived view on crisis management
 - From a technical point of view
 - From a sociological point of view
- It impacted our self-confidence

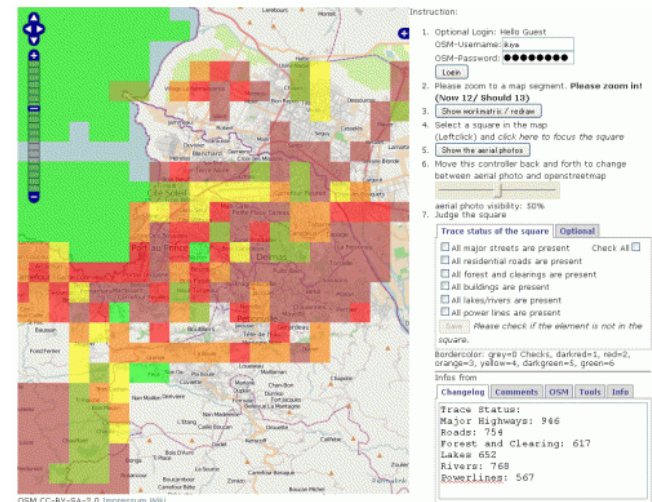
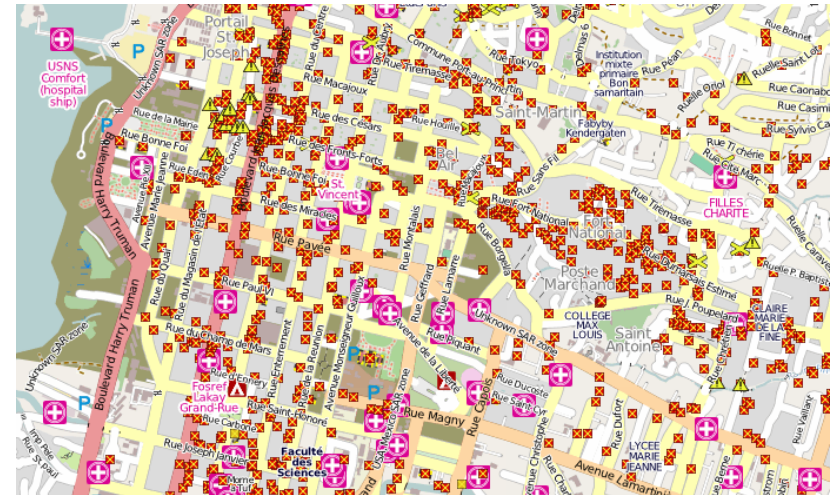
Haiti Earthquake 2006

- 7.0 Magnitude earthquake – 3.5M people affected – 220.000 death (est.)
- Hundreds of responding organisations



Unexpected event at an unexpected scale

- First responder : people
- Overwhelming answer from the international community (hundreds of NGO's)
- First important use of social network
- volunteer based crisis mapping
- <http://www.digital-humanitarians.com/>



Hurricane Katrina 2005

- Category 5 Hurricane
- Caused breaches to flood protection structures
- 80% of the city of New Orleans Submerged (1500 deaths)



Coordination issues

- Very wide area affected
- Several political decision levels
- Lack of preparedness
- Coordination issues during the evacuation

The Danube floods

- 2002,2005,2006,...,2014
- Very common event – cross international borders
- Requires a dedicated organisation - International Commission for the protection of the Danube River



Hurricane Sandy 2012

- Hits the East coast of the United States (NY City, New Jersey)
- High level of activities in social media



Crisis Management status

- The level of preparedness increases in developed countries
- ICT shows its benefits.
 - Easier access to information
 - Greater people involvement
- But still a lot of information management issues
- (See ISCRAM Conference)
- We can do better



Collaborative Network issues

- Setting up the network
- Aligning the goals
- Shifting of goals
- **Sharing informations**
- **Coordinating actions**
- *The citizen involvement*

Setting up the network

- Exercise, Simulation and training
 - Training for different level of events
 - Network building between traditional organisations
- Network Topology
 - Different topologies can be deployed
 - Depends on the extent and duration
 - Depends on cultural and political issues
 - Peer to Peer vs Star

Aligning the goals

- The network needs to agree on the goals
- High level goals : saving lives, protecting assets
- Variety of means and priorities
 - Evacuating, building dams, distributing food, providing health care, searching and rescuing
 - Lack of resources
- Again political issues

Shifting of the goals

- The crisis has a dynamic
 - More or less predictable
 - it may increase/evolve
- Rescuers have to adjust their goals
- Rescuers have to decide when to shift
- Rescuers have to decide what is the priority
- Search and Rescue
- Fulfilling basic needs
- Providing shelter
- Reconstructing
- Finding relatives
- Preventing epidemics
- Restoring security
- ...

Sharing informations

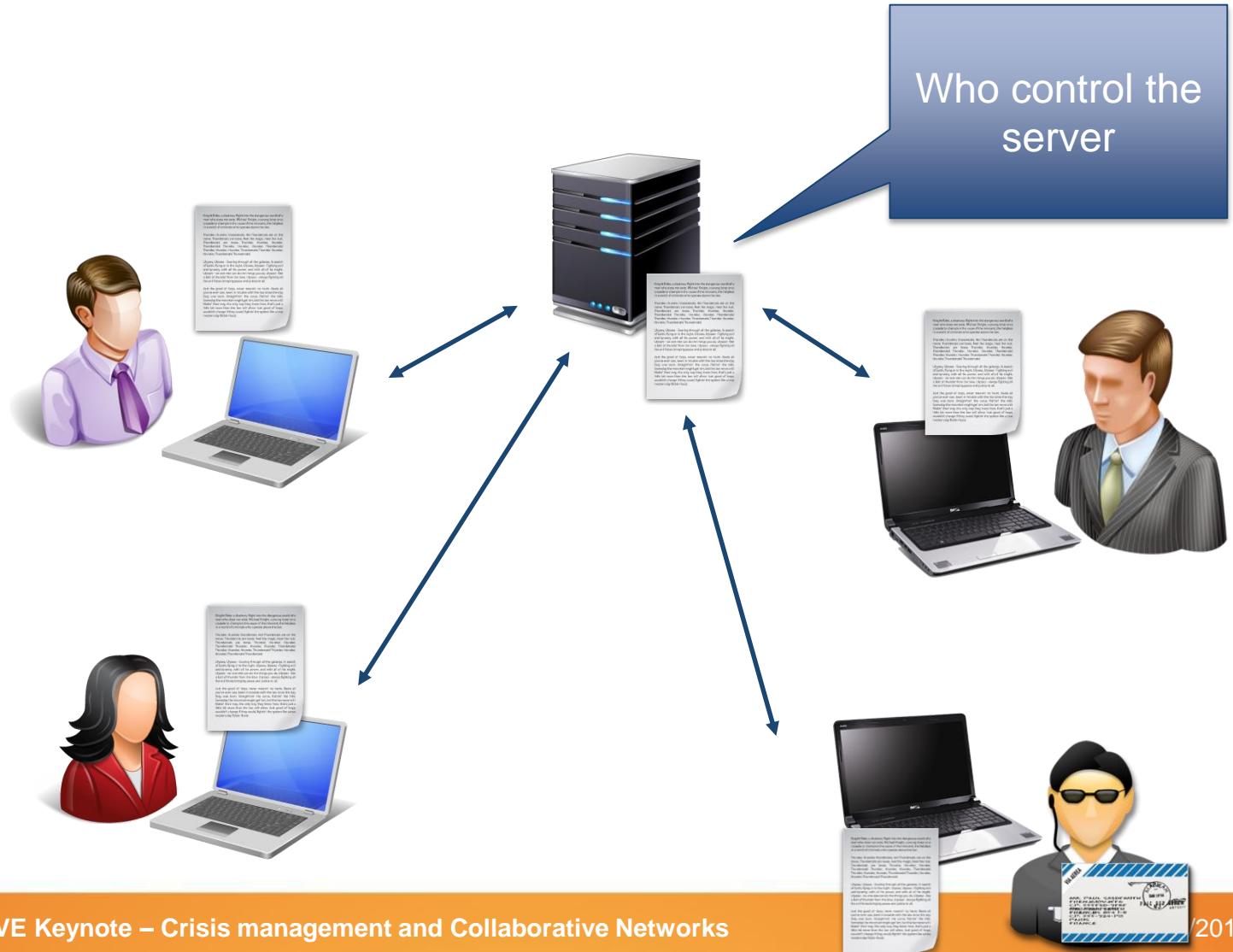
- Collaboration requires
 - to share information effectively
 - to preserve privacy
 - to contain information propagation
 - **trust** in the network
 - control on the data distribution

What do we share

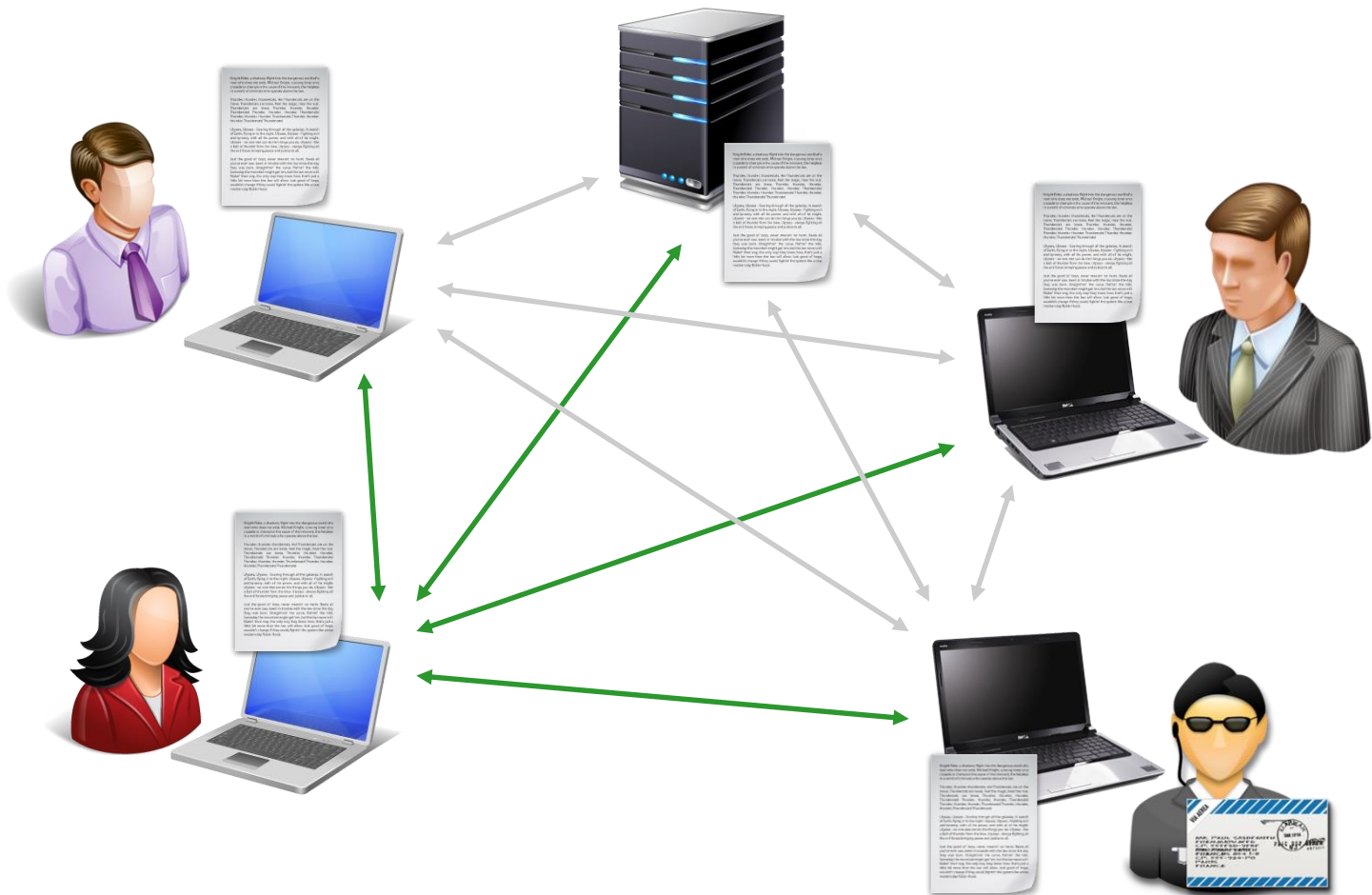
Documents
Calendars
Maps
Contacts
Plans

...

Traditional centralized architecture

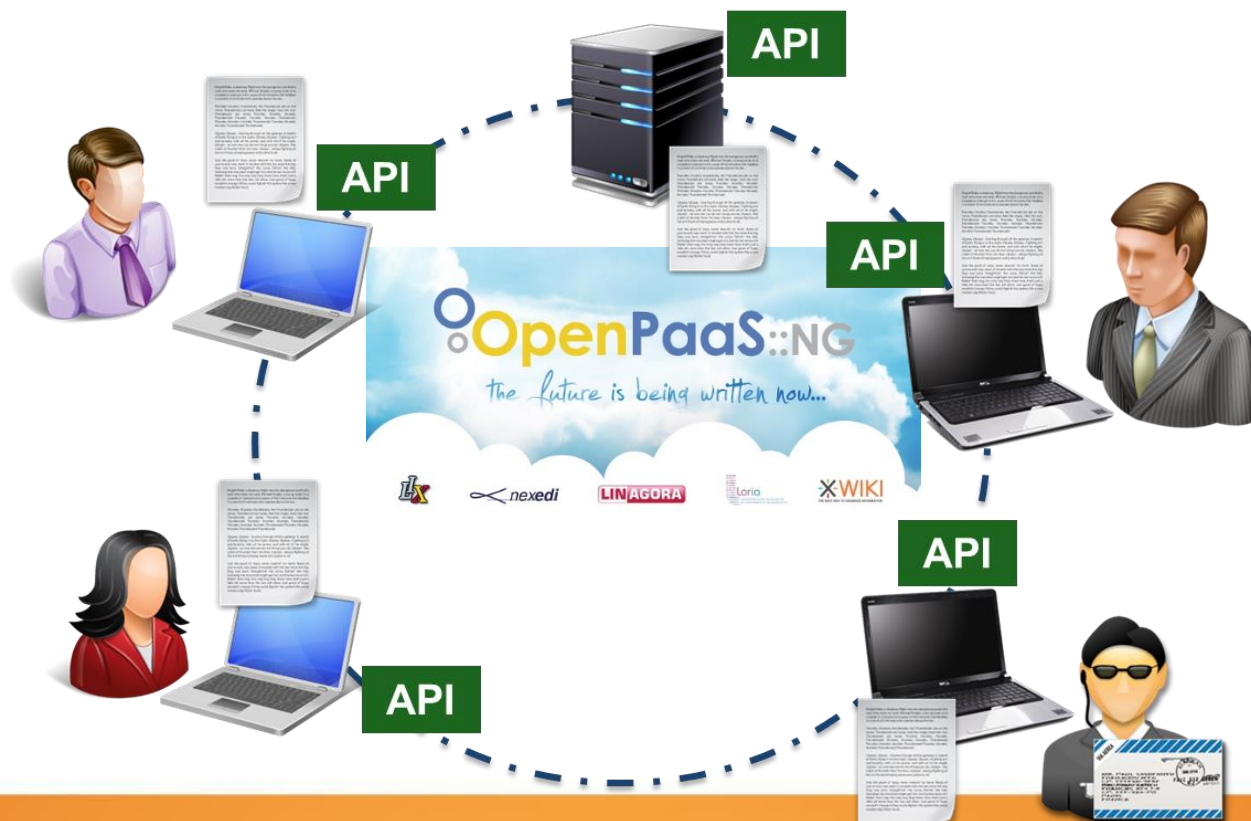


Naive p2p Architecture



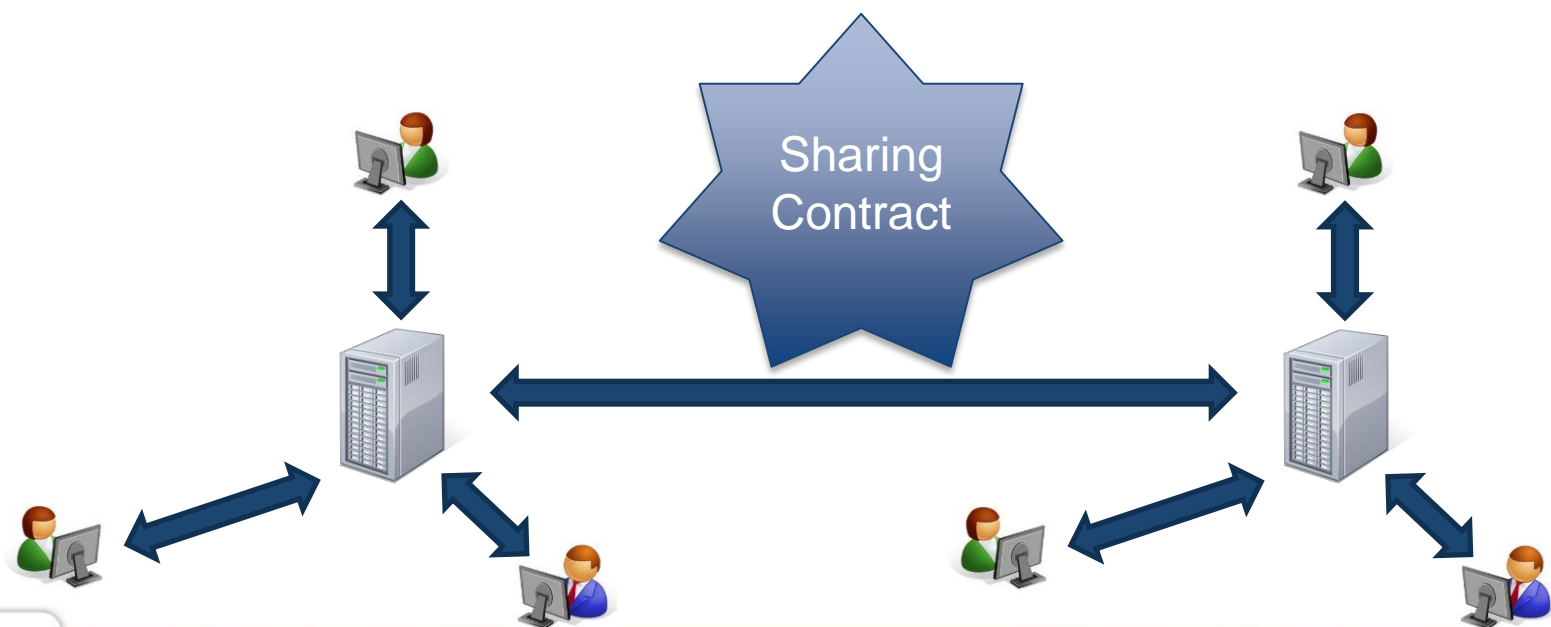
Abstract/Configurable p2p architecture

- Decide of the topology and the contracts



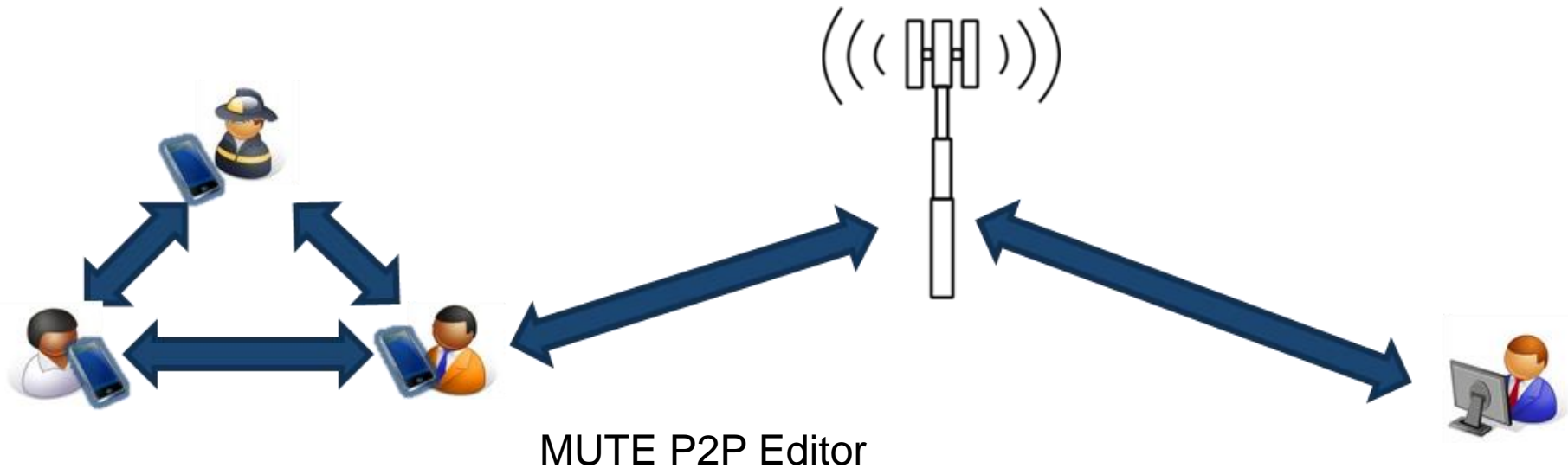
Hybrid collaboration between organisations

- Centralised inside organisations/ p2p between organisations



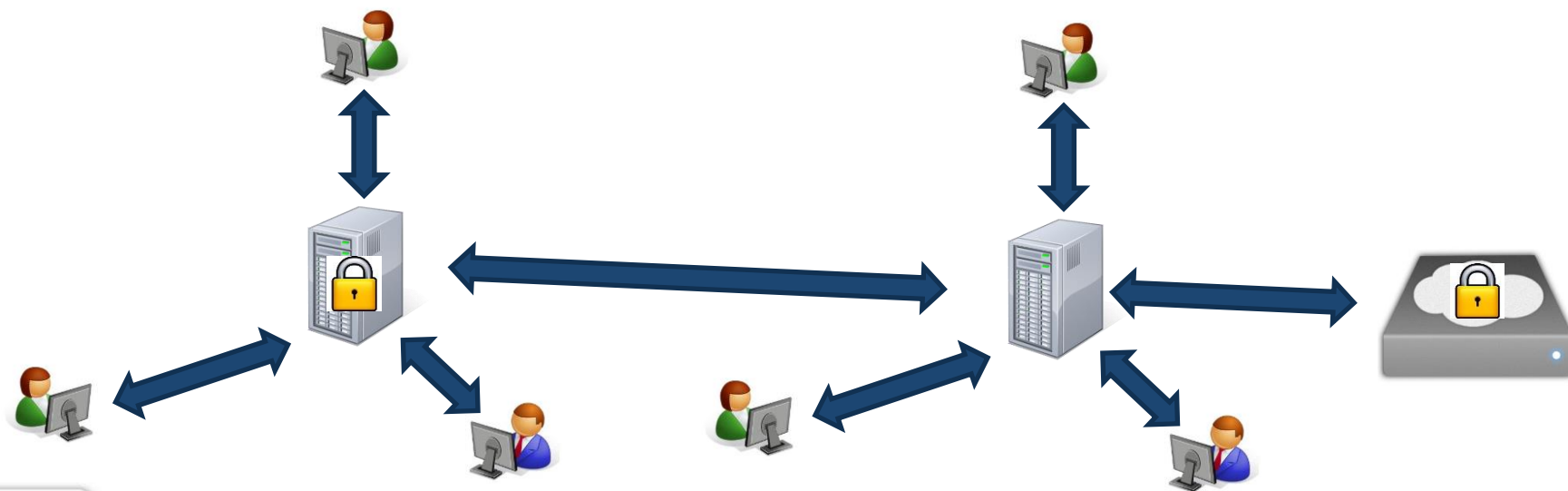
Ad-Hoc collaboration on the field

- P2p collaboration between people regardless of organisations



Secure distributed collaboration

- Collaboration data can be encrypted and not shared on the cloud (being investigated).
- **Provides guarantees to the participants**

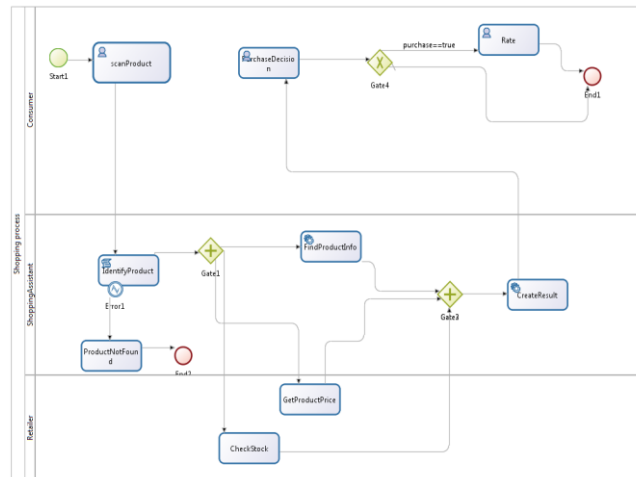


Coordinating actions

- Coordination between organisation is a cornerstone of collaborative networks.
- Important questions
 - Who governs the coordination
 - Who design the process
 - Who control the process

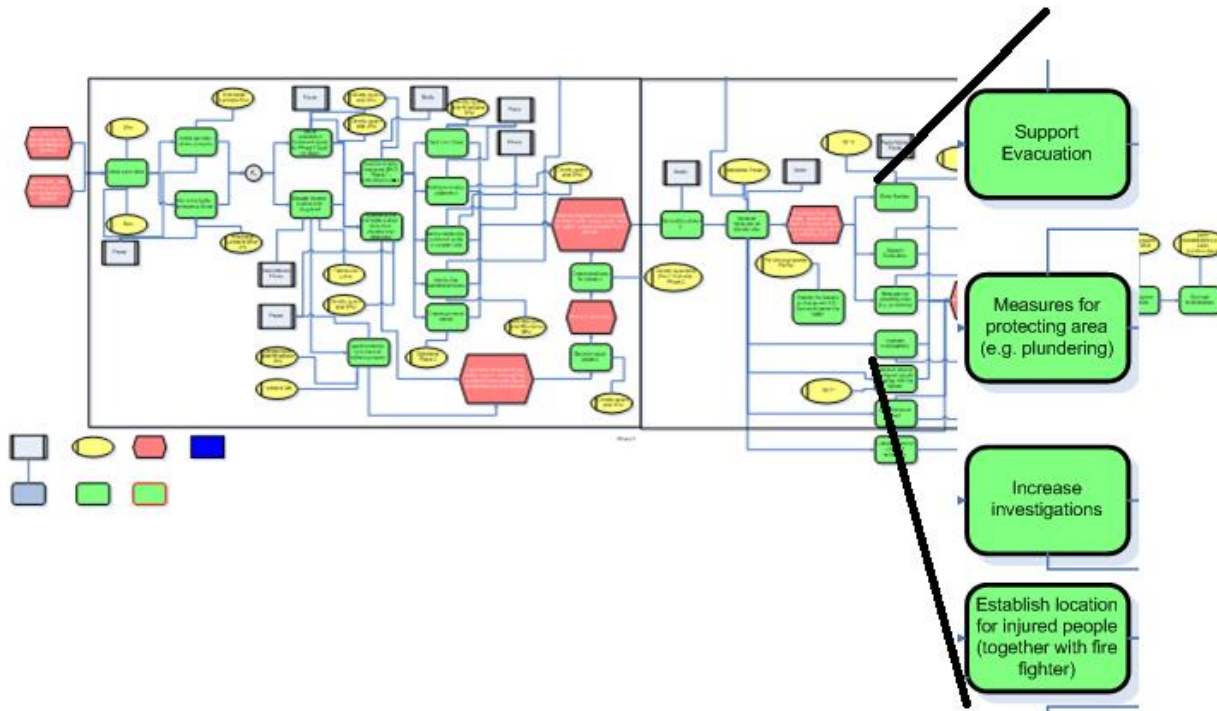
BPM and Crisis Management

- Business Process Management/Workflow Systems have been suggested for emergency management
- do they work for disaster management?



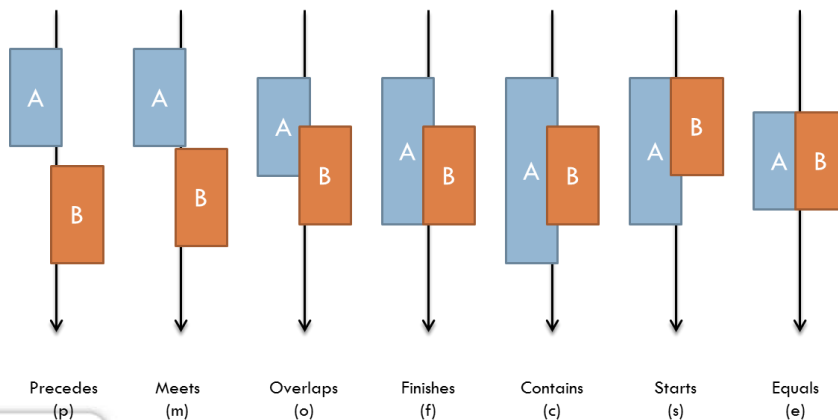
The answer is no/not really

- Outcome of a workshop with Firefighters



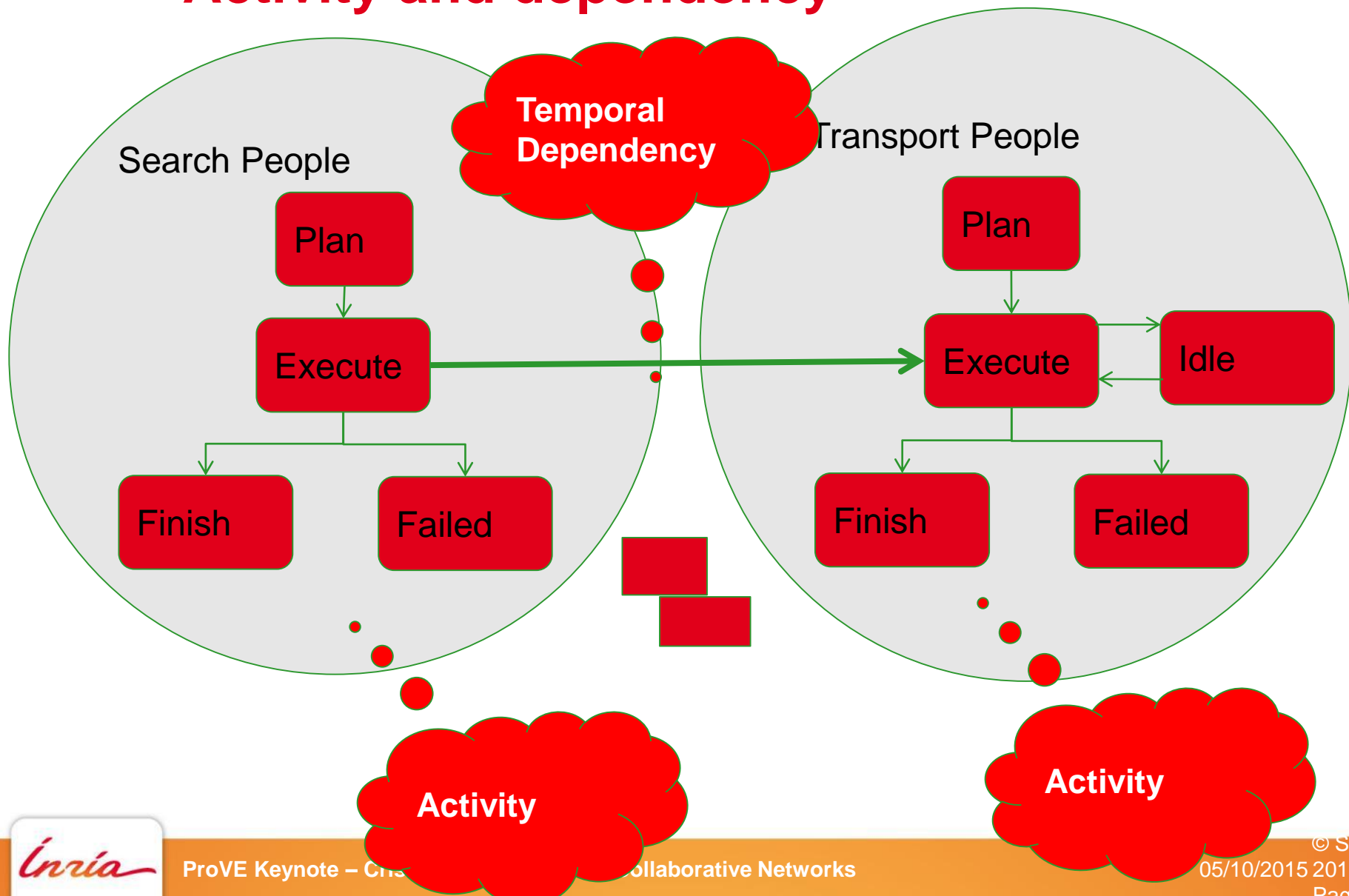
Four principles

- The model has to be dynamic
- Design time = Execution time
- Dependencies requires flexibility
- No one should own all the control

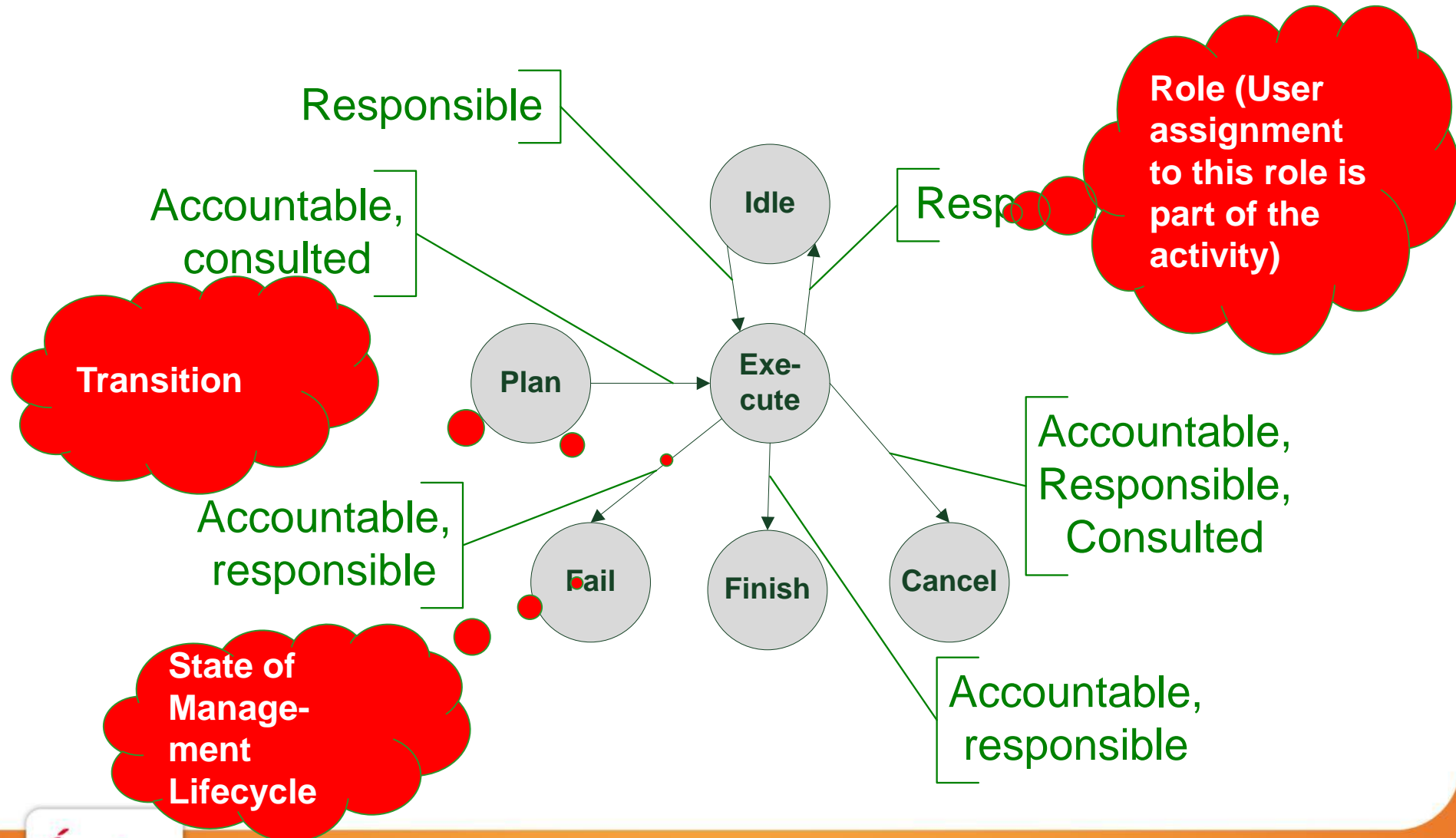


Allen Temporal dependencies

Activity and dependency



Activity and governance



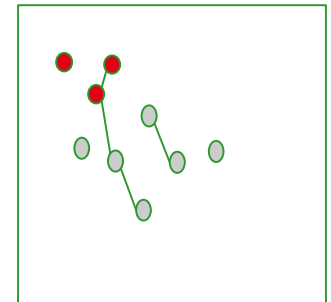
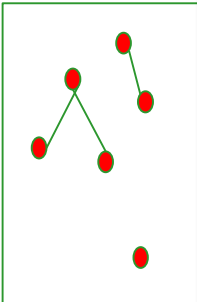
Inter organisational issues



“we are exchanging text information real-time through either cell or mobile units or satellite”

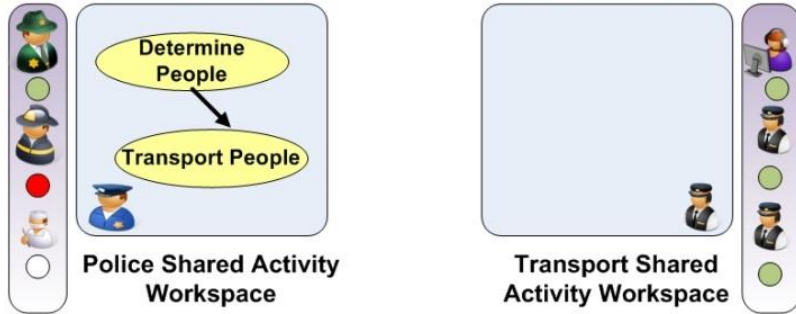
[..]

“obvious the more complex a situation gets, for instance where you may have many organizations working collectively in order to accomplish a goal, but at the same time working independently in terms of their own interests, where you get in those in situation like that, you know it get to the point, to be so complex that it would be overwhelming”

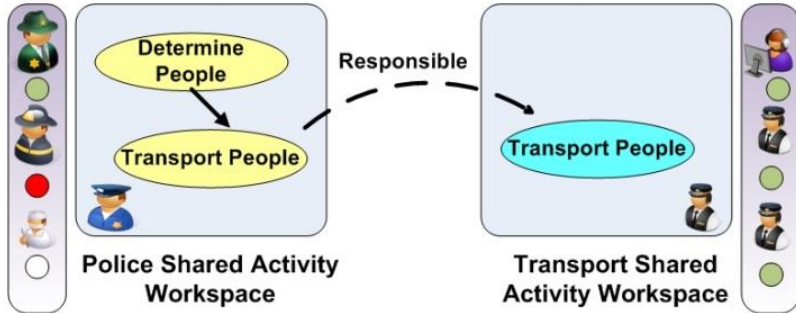


Coordination problem awareness

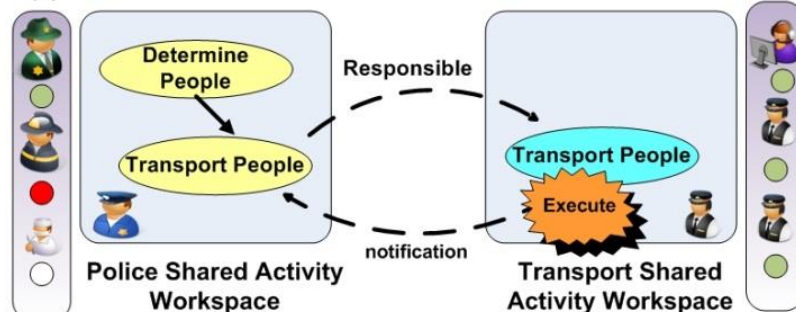
(1)



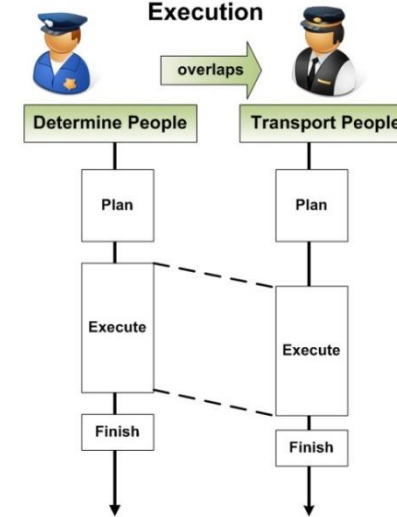
(2)



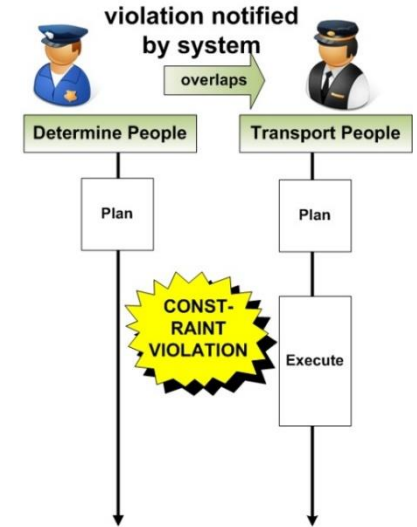
(3)



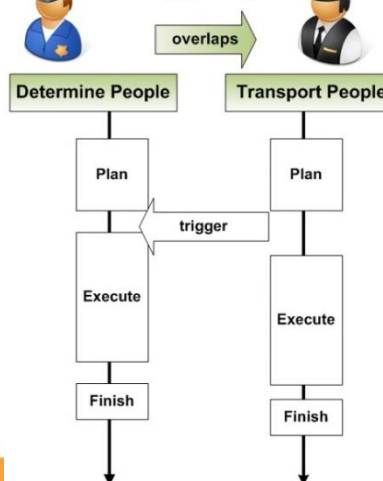
Normal Execution



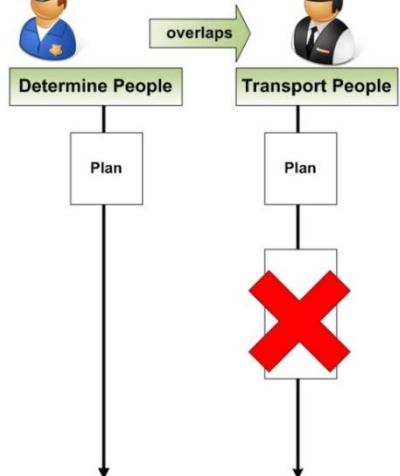
Constraint violation notified by system



Triggering



Enforcement



Implementation on Google Wave

The screenshot displays the Google Wave interface. At the top, the browser address bar shows the URL: <https://wave.google.com/a/wavesandbox.com/#minimized:search,restored:wave:wavesandbox.com%252Fw%252Bq9d4nRSjA.1>. The page title is "Unstructured (2) - Googl...".

The main content area is titled "Activity Dashboard" and shows a list of activities. A dialog box titled "Create Dependency" is open in the foreground. The dialog contains the following information:

Independent Activity:	BuildBlock(2x2, light green)	Execute
has dependency	Precedes	
Dependent Activity:	TransportBlock(2x2, light green)	Execute

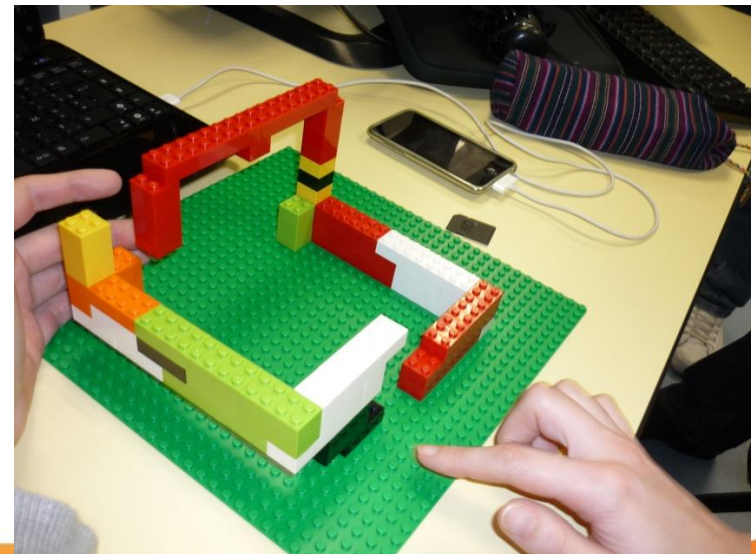
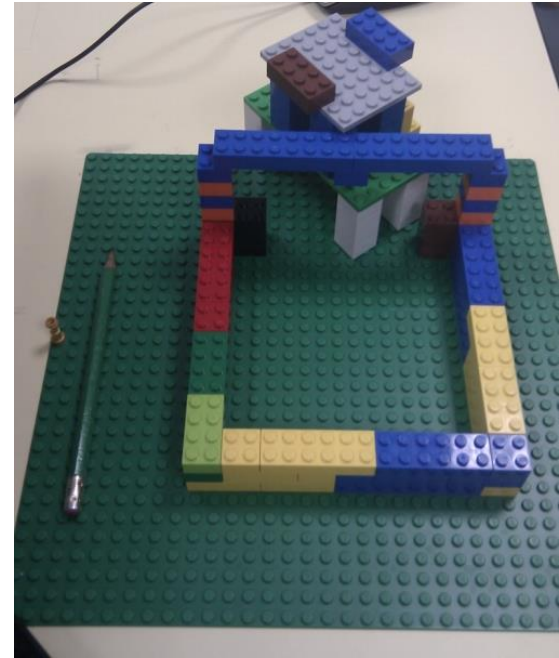
Below the form, a diagram shows a green box (Independent Activity) with an arrow pointing to an orange box (Dependent Activity). A text box below the diagram contains the following text:

```
Precedes:  
'BuildBlock(2x2, light green)' has to  
enter state (Execute) and leave this  
state before 'TransportBlock(2x2, light
```

The dialog also has "OK" and "Cancel" buttons at the bottom.

Experimentation

- How to validate the model ?
- Crisis are difficult to replicate
- Very few crisis management exercises



A new partner for crisis management: the citizen

- A challenge for traditional response organisation
- They are the first responders
- They have sophisticated communication tools
- They have volunteers all over the world
- It's simple but it's challenging

International and official recognition

- Since Haiti the role of social media and of digital volunteers is recognised
- Ushahidi
- Digital Humanitarians
- Visov (French organisation)
- ...

But...

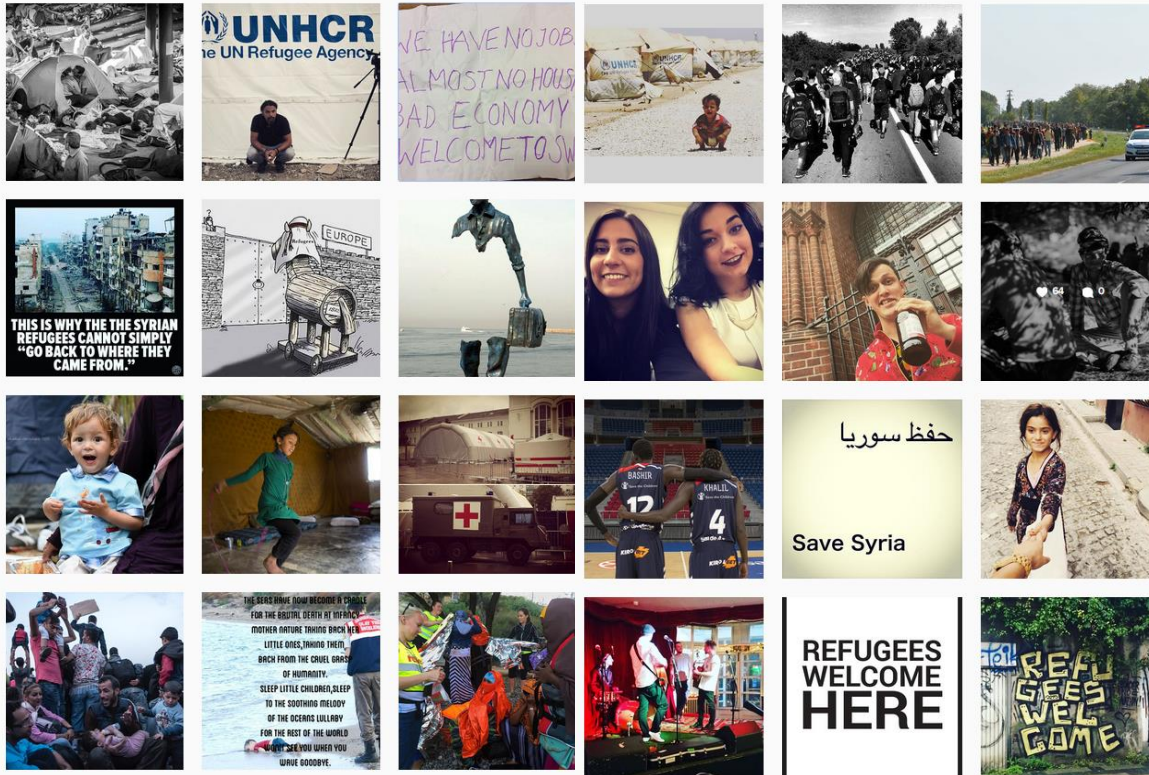


The Refugee crisis 2015

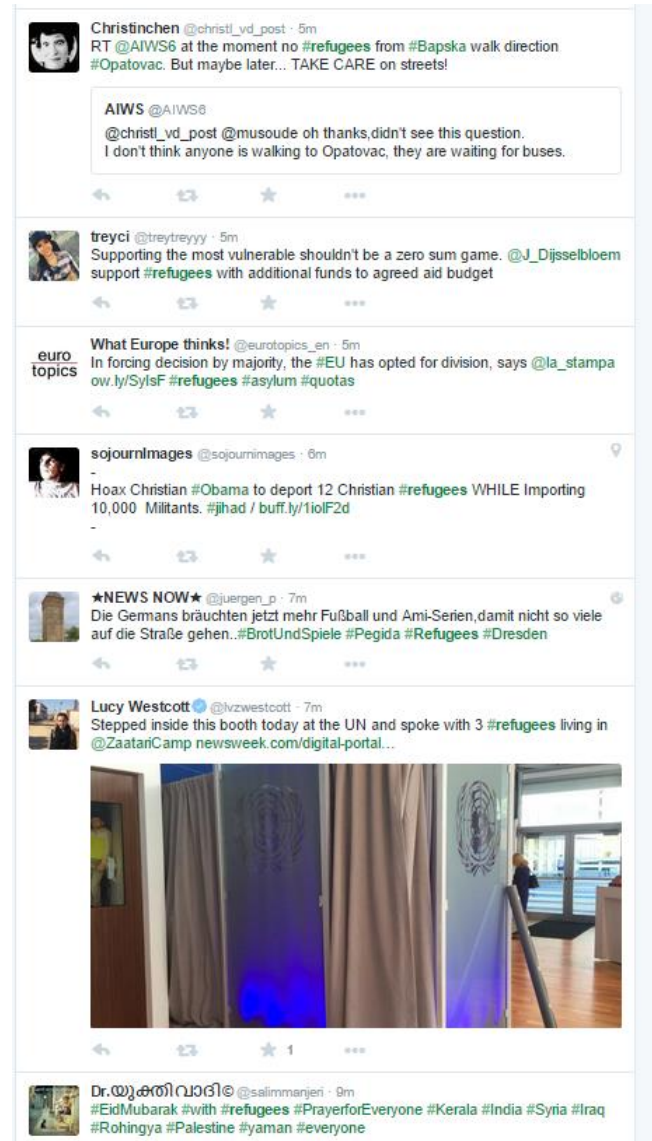
- A very tricky kind of crisis
- Affect international relationships
- Difficult agreement on the response



The #refugees response



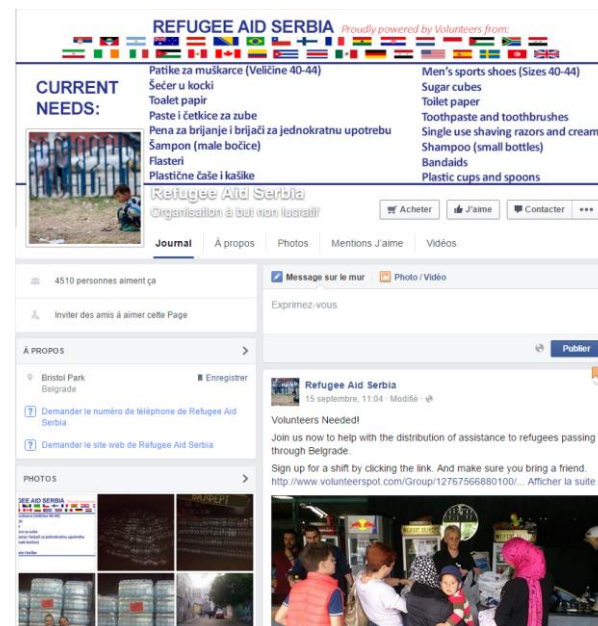
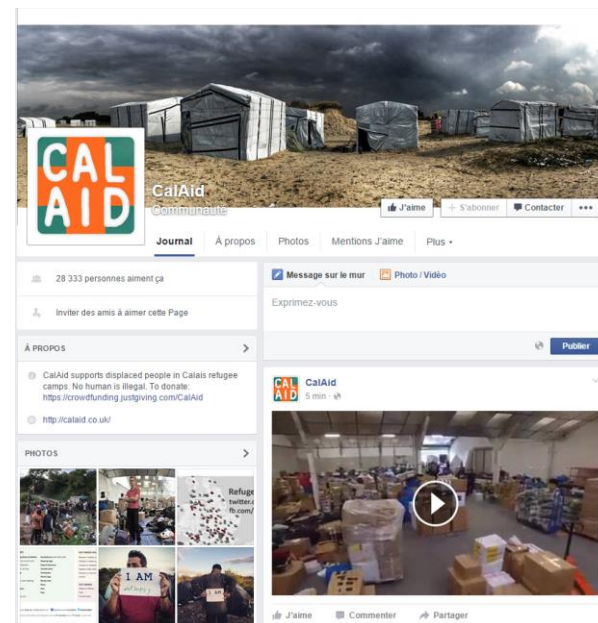
Instagram stream – 23/9/2015



Twitter stream – 23/9/2015

Citizen initiative

- Citizen create Facebook pages to coordinate
- Different dimensions and scale
- Collect and distribute resources directly



Crowdfunding

- Citizen initiative
- With or without GNO support

Home village for Calais refugees
Construction

127% €12,786 committed on a goal of €10,000

Successfully FUNDED
Funded on the 04/19/2015

Creator: COH
Calais
1 created project
Send a message

Rewards: For €5 or more

Un enorme merci de la part de tout-e-es les bénévoles actuellement sur le terrain ainsi que de la part de toutes les personnes lutent pour survivre actuellement et pour qu'à ces constructions sont indispensables.

Hi everybody,
Thanks to all the contributors for helping us to reach and overpass our target of 10 000 €. Don't stop! Go on! Facing the huge needs and work to be done we will, however, never have enough...
The creation of the new day center on the outskirts of the city is related to the willingness to dismantle all the camps, squats and jungles. Thousands of people will become homeless.

A ship for refugees

Be a part of the crowdfunding effort to fund the first rescue campaign of SOS MEDITERRANEE in partnership with Médecins du monde.

180% €180,922 committed on a goal of €100,000

33 days left

Contribute starting at €1

Payment secure

Creator: SOS Méditerranée
Marseille, Berlin
1 created project
Send a message

Choose your rewards: For €1 or more

You will be registered for our mailing list, to receive our «Situation Reports». The report is regularly updated by our teams.
This will keep you updated on our operations, as well as the general situation of refugees crossing the Mediterranean Sea.

BNP Paribas supports this project
As part of its engagement to help support refugees, BNP Paribas has contributed 50 000 euros to this first "heroic" project

new goal: 200 000 €!

Since January 2015, over 100.000 people have risked their lives, leaving off the coast of Libya and crossing the Mediterranean Sea, hoping to find refuge in Europe. According to the OIM (the International Migrations Observatory), more than 2.500 refugees lost their lives in an attempt to reach European shores.

Mapping information about aid initiatives

Mapping Information Network for Refugee Support / where to donate, local groups and other useful info.



Aid Initiatives

ADD YOUR EVENT [HERE](#)

Donations

- Drop-off Hubs
- Collections
- Drop-off and Collection
- Fundraising *coming soon*

Other Projects

- Gatherings
- Groups
- Meetups

About

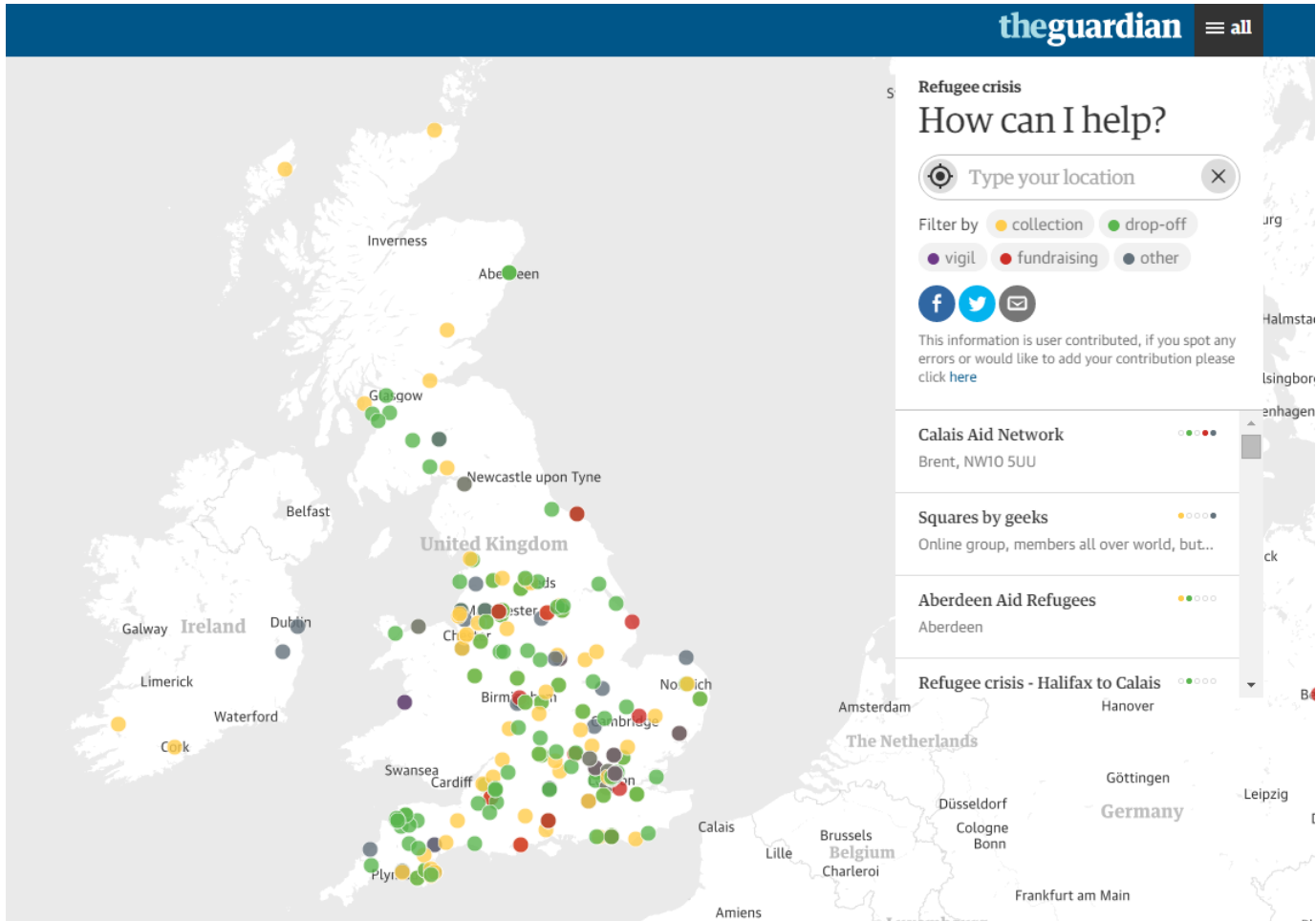
This is a crowdsourced map of grassroots activities organised to assist aid for refugees.

This data has not been independently verified.

Please submit details of organised collections and trips to donate using [this form](#).

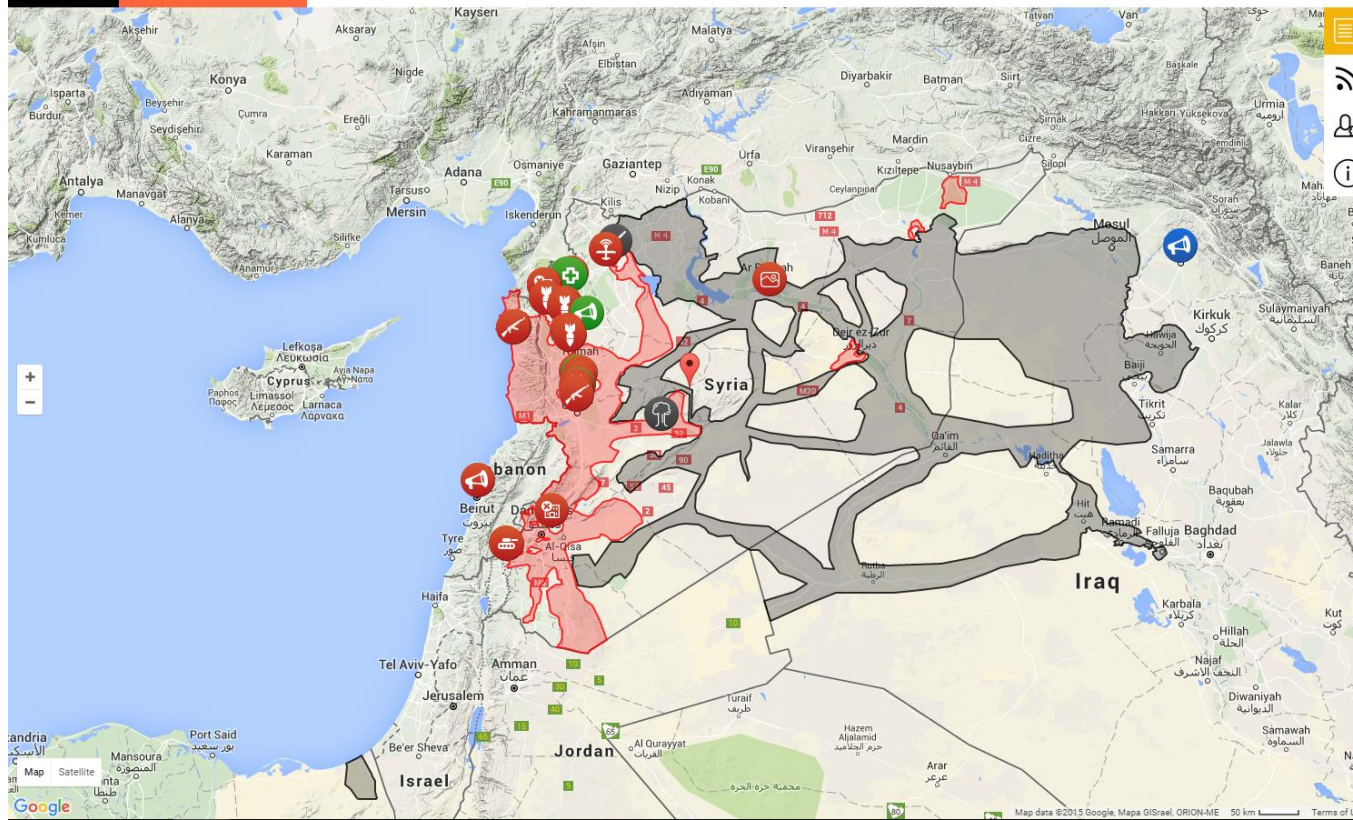
Allow 1 hour for your event to appear to the map.

Follow us on [Twitter](#) for updates.




Mapping of events in Syria

LIVEUAMAP 01 October 2015 UKRAINE MIDDLE EAST ISIS SYRIA EUROPE GAZA RUSSIA TURKEY BUSINESS AFRICA KOREAS AMERICA HONG KONG



5 hour ago Comments 0
Russian air force jets fly a second wave of attacks on the city of #Jisr Ash Shughur in #Idlib province



source tell friends

5 hour ago Comments 0
#Iraq Pm #Abadi: #Putin told me Russia fighting #ISIS in Syria and I trust him, I'm open to Russian airstrikes vs Daech in Iraq

source tell friends

5 hour ago Comments
Russian foreign ministry says it would consider any request from #Iraq to conduct airstrikes against Islamic State in Iraq

source tell friends

5 hour ago Comments
Pentagon officials have scheduled a video teleconference with Russian counterparts for 11 am, it's the "start of the deconfliction talks"

source tell friends

Official vs citizen initiative

Trace the Face
Migrants in Europe

Home | Photos | Publish your photo | Background information | Participating countries

Photos

Photos of people looking for their relatives

If you recognize your family member on one of these photos:

- > Please click on the link "Do you have information?" below the photo and fill in the contact form or
- > Please contact the Tracing Service of the National Red Cross or Red Crescent Society in the country of your residence. Your information will be kept confidential

To facilitate the search, you can filter by gender, age and country of origin.

Filters: Gender: All | Age: All | Country of origin: All | Search | clear results

1 - 12 >

I'm looking for my Daughter
0000446
Do you have information?

I'm looking for my Family
0000445
Do you have information?

I'm looking for my Nephew
0000444
Do you have information?

I'm looking for my Family
0000443
Do you have information?

REFUGEES WELCOME

FIND YOUR FAMILY/FRIENDS

Search and find your family for refugees

Communauté

J'aime + S'abonner Contacter

Journal | À propos | Photos | Mentions J'aime | Vidéos

4007 personnes aiment ça

Message sur le mur Photo / Vidéo

Exprimez-vous

Publier

À PROPOS

Dear Refugee, if you lost your family or someone of your family, we will share your request!

PHOTOS

If you get to know refugees who are looking for family members which arrived in austria, are on the way to germany or still in hungary ask for the name, photo or telephone number and try to communicate this through this site. So people can keep an eye open at the stations. Please check <http://familylinks.icrc.org/europe/en/Pages/Home.aspx> too!

J'aime Commenter Partager

58 personnes aiment ça. Plus récents >

75 partages

Afficher 10 autres commentaires

Carla Oyarzo From Sweden!
This man was separated from his family in Bulgaria. He is looking for his wife Sonja and two kids!

Airbnb for refugees



Idea

Countries

Support

Concept

FAQ

Team

Press

Blog



Germany

We started the project in November 2014 from Berlin. Since then we are working on a new culture of welcome in Germany :) www.fluechtlinge-willkommen.de.



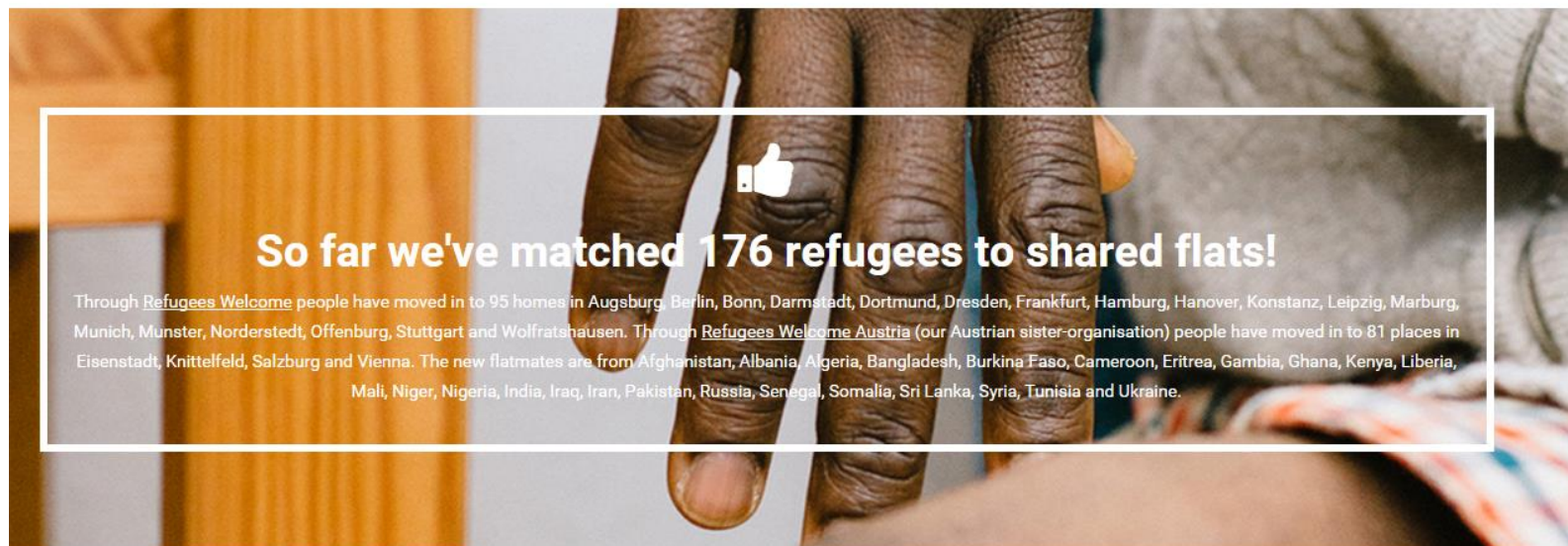
Austria

Since January 2015 our sister organization in Austria is working hard on a new culture of welcome :) www.fluechtlinge-willkommen.at.



Your country?

At the moment we're supporting groups in more than 20 countries all over the world with setting up "Refugees Welcome" in their country. [Here you can have a look if your country is already listed](#)



So far we've matched 176 refugees to shared flats!

Through [Refugees Welcome](#) people have moved in to 95 homes in Augsburg, Berlin, Bonn, Darmstadt, Dortmund, Dresden, Frankfurt, Hamburg, Hanover, Konstanz, Leipzig, Marburg, Munich, Munster, Norderstedt, Offenburg, Stuttgart and Wolfratshausen. Through [Refugees Welcome Austria](#) (our Austrian sister-organisation) people have moved in to 81 places in Eisenstadt, Knittelfeld, Salzburg and Vienna. The new flatmates are from Afghanistan, Albania, Algeria, Bangladesh, Burkina Faso, Cameroon, Eritrea, Gambia, Ghana, Kenya, Liberia, Mali, Niger, Nigeria, India, Iraq, Iran, Pakistan, Russia, Senegal, Somalia, Sri Lanka, Syria, Tunisia and Ukraine.

New challenges for collaborative networks in crisis management

- Fast creation of large scale collaborative network
- Coordination at different scales
 - People/Organisations
- Updating and sharing data at a large scale
 - Trust/Privacy issues
- Involvement of people/The crowd

QUESTIONS ?

Credits

- Some slides have been prepared by
 - Jorn Franke (Activity management)
 - Gérald Oster (P2P sharing)