Workshop 3.3 :

CAP and mobile multimedia alerts

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31 October 2018, Hongkong

About one2many

5G XCAST

80 installations
at 50 customers
in 30 countries

50% market share

Leader in
Standardization of
public warning in
ATIS, 3GPP, ETSI

Our Customers Support
300+ MILLION
Mobile Subscribers

Local offices on each
continent

Multiple nationwide
public warning solutions
&
leading CAP consultancy
provider

Industry's
LEADING TECHNOLOGY
World's First Cell broadcast and 3G, 4G integration

Public Warning as a Service (PWaaS) & eMBMS

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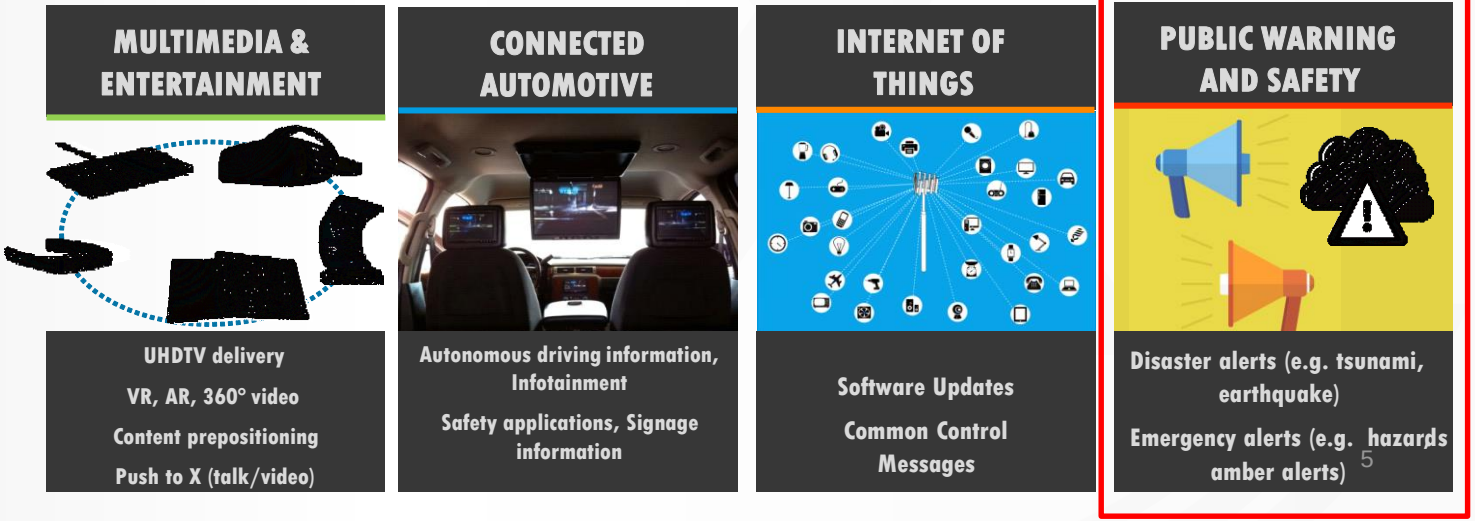
Contents

- 5G-XCAST research project
- Public warning in 5G-XCAST
- Usage of CAP for multimedia alerting
- Observations and next steps

Broadcast in 5G?

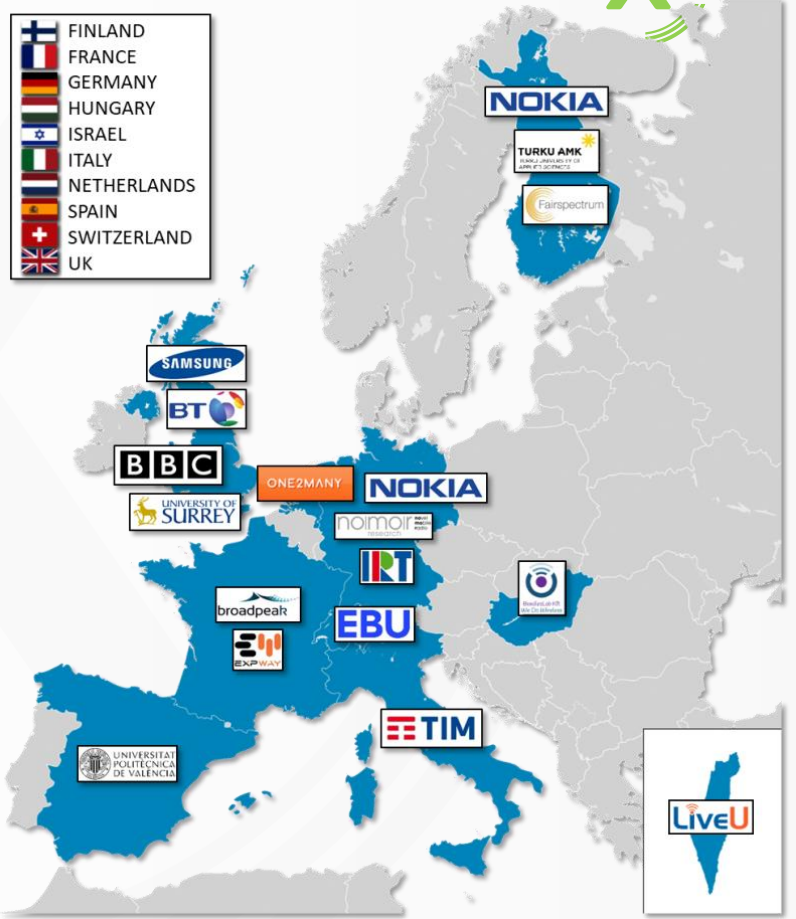
- Broadcast transmissions are key in many 5G use cases but
  - multimedia capable broadcast has not been considered in the first release of 5G (3GPP Rel'15)
  - Text based cell broadcast will be there in 5G to support public warning!
- 5G-Xcast is designing broadcast on top of 5G radio and 5G core



5G-Xcast Consortium

- 18 partners from 9 countries
  - 2 broadcasters & associations
  - 5 telecom operators & vendors
  - 8 SMEs
  - 3 universities

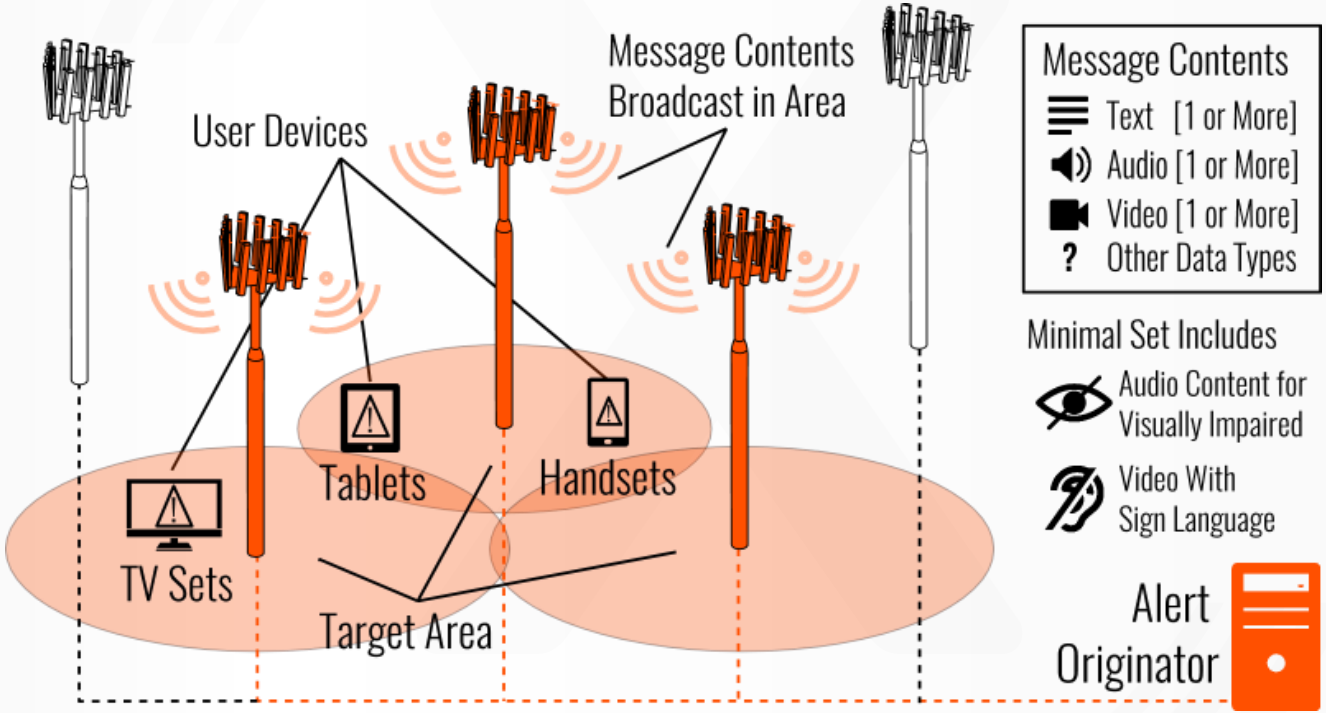
Balanced and strong consortium between the telecom and broadcast world



How does the research project work?

- Create use-cases and discover detailed requirements
- Analyse what is available today
- Propose new architecture, features, call flows
- Implement trials
- Spread the knowledge!

5G-Xcast Public Warning Use Case



Challenges of multimedia public warning over mobile today

- Todays cell broadcast can send public warning messages as text but multimedia is not well supported

- LTE broadcast (eMBMS) can deliver multimedia messages but:
  - Lack of mechanism to trigger broadcast reception in the mobile phone, this currently requires the user to start the broadcast reception
  - Challenges with configuration for the target area

Public Warning Trials in 5G-Xcast

Use case PW “Multimedia Public Warning Alert” :

- Delivery multimedia public warning messages to large audiences using LTE eMBMS
- Transmission of alerts for users with hearing and vision deficiencies
- Successful delivery of alert in various reception conditions to several UEs using broadcasting (indoor, outdoor, mobile)

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Why are we using CAP in our trial?

- CAP can support multimedia content:
  - Embedded together with the alert information
  - External content using links
- And also:
  - The alert creation tool supports CAP
  - A CAP alert can be conveniently broadcasted by the one2many eMBMS (LTE broadcast)

Options for creating multimedia content

- Automatically generated content:
  - Convert contents of the alert into multimedia
  - Embed the logo of the alert issuing agency

- Allow the alert creator to define the multimedia content:
  - Select pictograph from a collection that includes the common alert types (storm, heavy rain) and recommended action (evacuation, stay at home)
  - Adding pre-defined handling instructions for a known type of alert

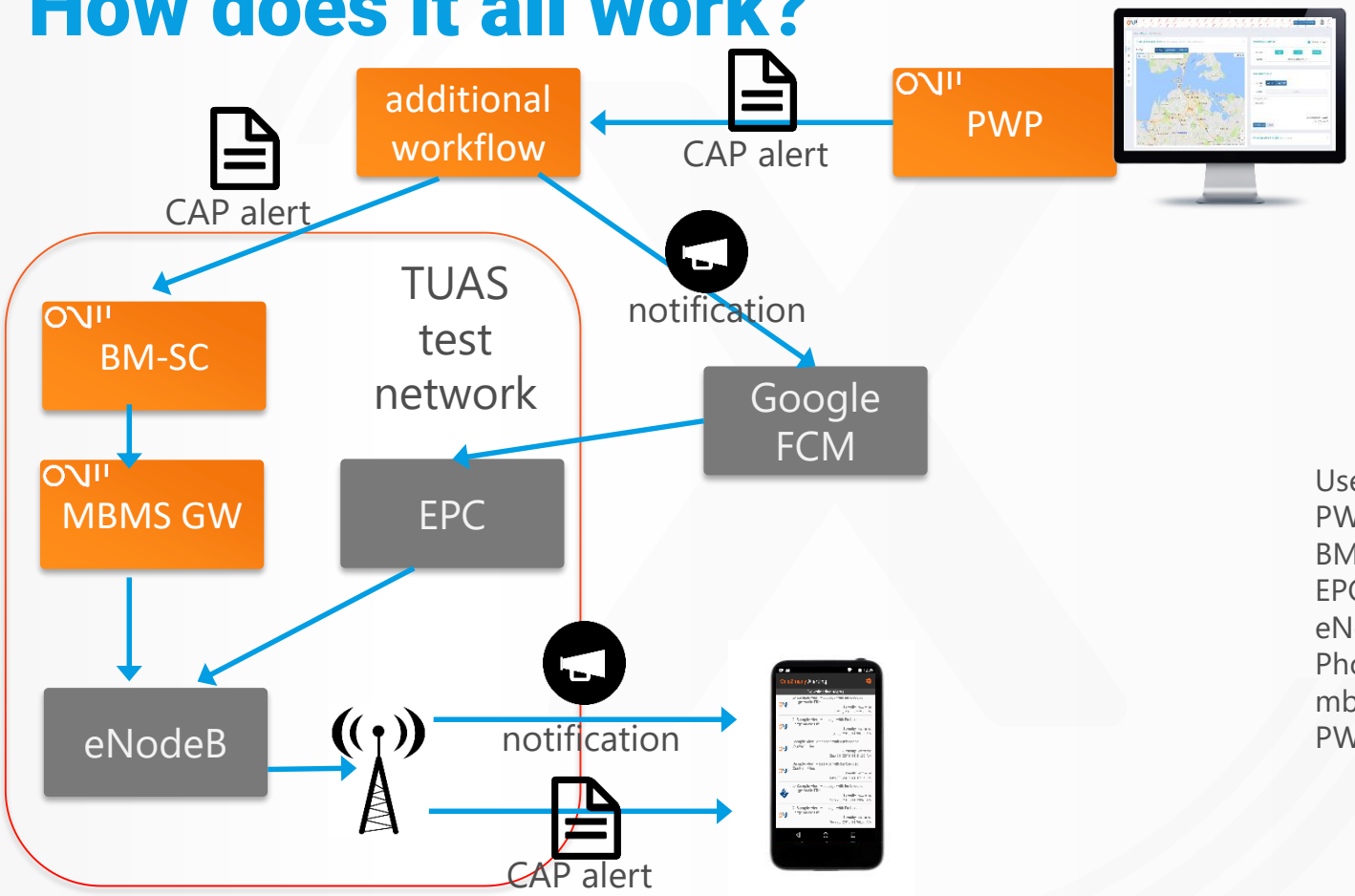
Adding the content into CAP

- The multimedia content must be base64 encoded (RFC 3548)
- For most programming languages libraries exist to do this for you
- Online conversion tools exists as well:
  - https://www.base64encode.org/
- Base64 encoding does increase the size of the content

CAP multimedia example snippet

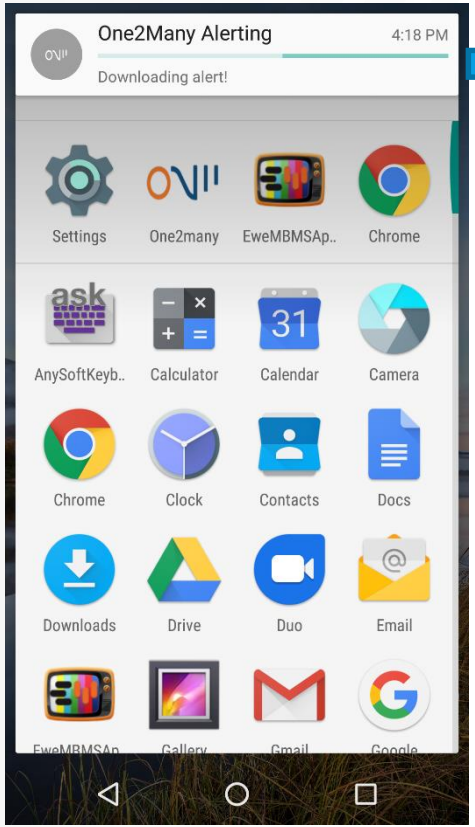
```
<resource>
  <resourceDesc>audio alert in English</resourceDesc>
  <mimeType>audio/mpeg</mimeType>
  <size>120192</size>
  <uri>audio_alert_EN.mp3</uri>
  <derefUri>iVBORw0KGgoAAAANSUhEUgAAAyAAAAMgCAMAAAD
srvZaAAAABGdBTUEAALGPC/xhBQAAAAFzUkdCAK7OHOkAAADAUExURfz9/P
…
…
ICAgICAgICAgICAgICAgICAgICAgICAM</derefUri>
  <digest>700b1bfc8c93db2ea03cf2ba9949218b0e98339d</digest>
</resource>
```

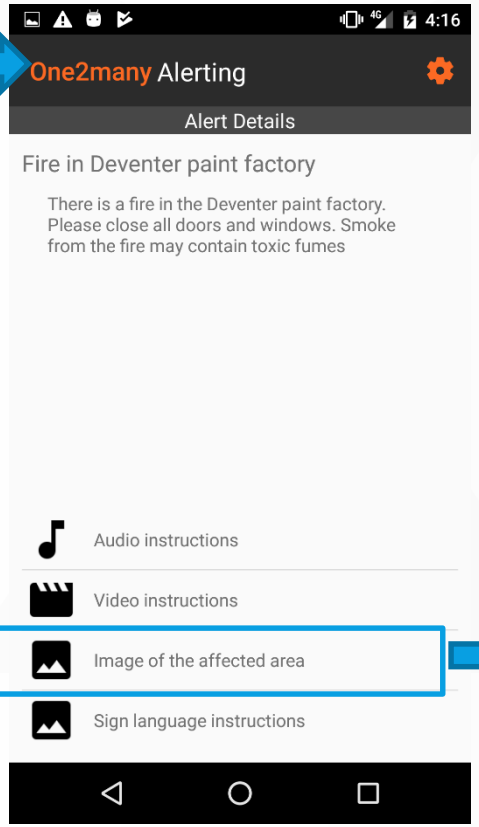
How does it all work?

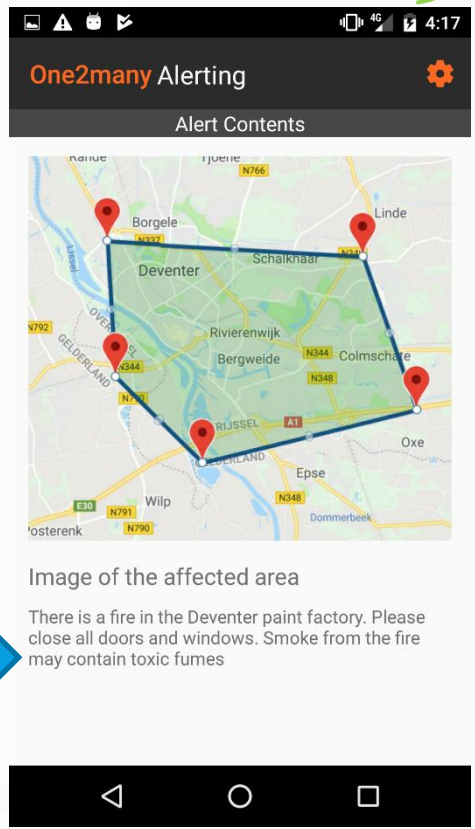


Used equipment:
PWP: one2many
BM-SC, MBMS GW: one2many
EPC: Cumucore
eNodeB: Nokia
Phone: Bittium
mbms middleware: Expway
PW App: one2many

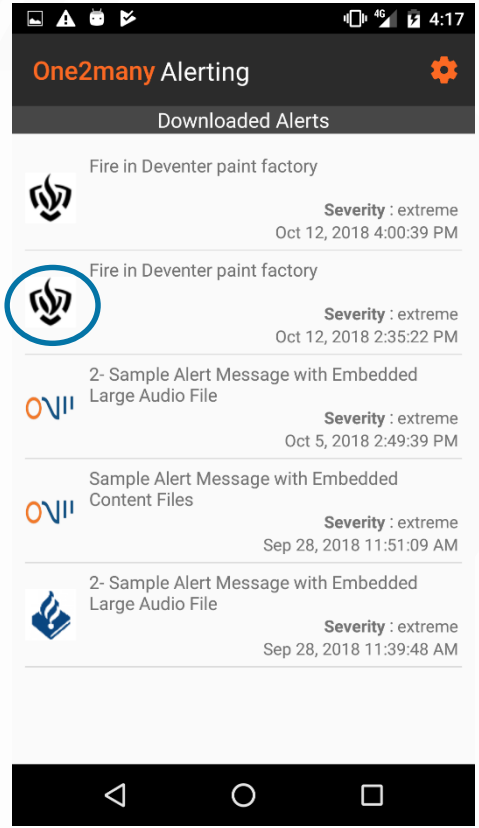
Screenshots of the App 1







Screenshots of the App 2



Observations 1

- The broadcast is very efficient; no network overload
- It takes just several seconds for the entire multimedia alert to download.
- The Google FCM notification is generally very fast but
  - there were a few occasions that it took minutes to arrive on the phone
- Currently the Google FCM notification only contains the URL, not the alert itself

Observations 2

- CAP can embed any type of content but a suitable player is needed on the phone to render
- Some content could also be generated on the App

5G-XCAST next steps for PW

- Perform tests based on documented requirements
- The radio group (WP3) is considering how to trigger the public warning alert
- Experiment with text cell broadcast to trigger the App
- Test with alert using external content (links) where the CAP alert is sent using FCM and the multimedia content using HTTP and/or broadcast
- Plan to test with dynamic spectrum

Public deliverables, scientific papers, presentations:
http://5g-xcast.eu/documents/

Website:
www.5g-xcast.eu

Twitter:
@5Gxcast

Thank You

Videos:
https://www.youtube.com/channel/UCCl2iSgTDx42UiLoRcDyDBg
https://youtu.be/daFOf30NG2U

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Any Questions ?