

Next Generation 112 Emergency Services

Janez STERLE University of Ljubljana

12th International Crisis Management Conference Ljubljana, June 2017



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 653337.

The NEXES RIA



| Action full title | NEXt generation Emergency Services | |
|-----------------------|---|--|
| Action acronym | NEXES | |
| Type of Action | Research and Innovation Action | |
| Work Programme | DRS 19-2014: Communication technologies and | |
| Торіс | interoperability | |
| | Topic 2: Next generation emergency services | |
| Grant Agreement No. | 653337 | |
| Start Date – End Date | May 1 2015 – April 30 2018 | |
| Web site | http://nexes.eu | |



The NEXES Consortium





17 Partners / 11 Countries:

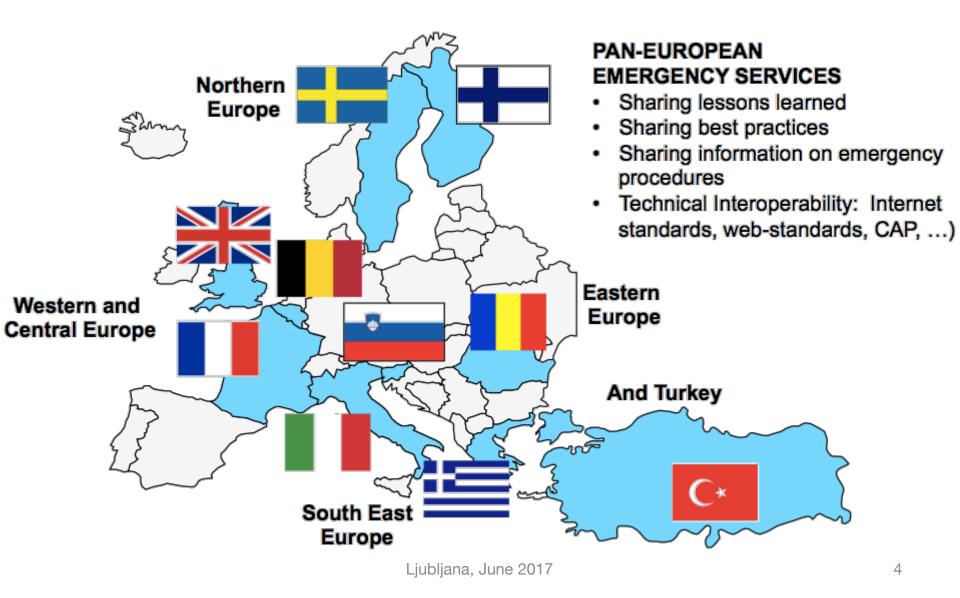
- 7 End-users
- 4 SMEs
- 4 Industries
- 2 Universities

Partners Expertise:

- Emergency Services
- Training Organisation
- Civil Society Organisation
- Telecommunications Network Operators
- Technology/Software Developers
- Academia

The NEXES Consortium

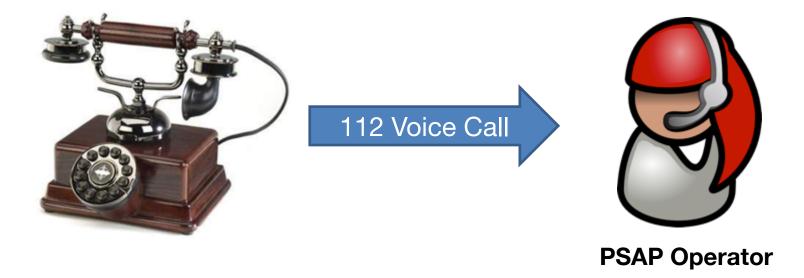




Main targets and challenges



Today an emergency call is mostly voice ...

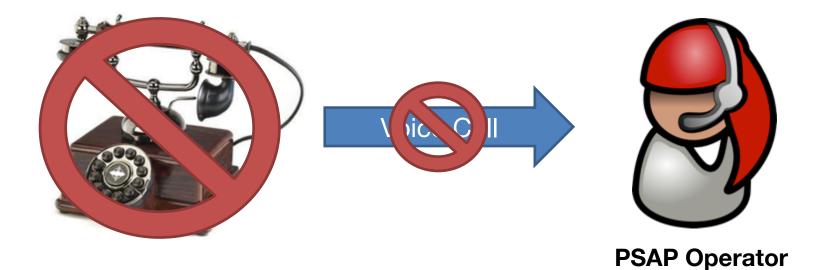


... based on technologies established in the past century

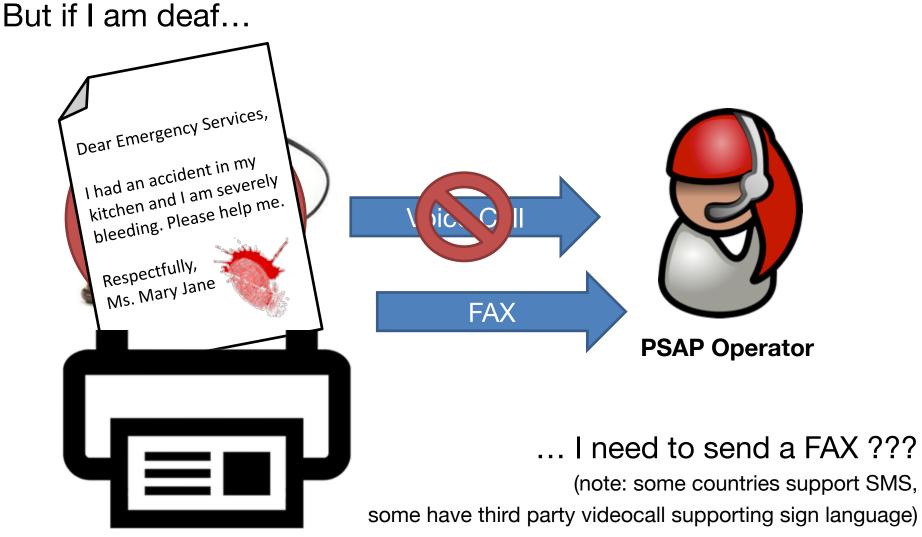
Main targets and challenges



But if I am deaf...



Main targets and challenges



Location, Location, Location



Where are you?



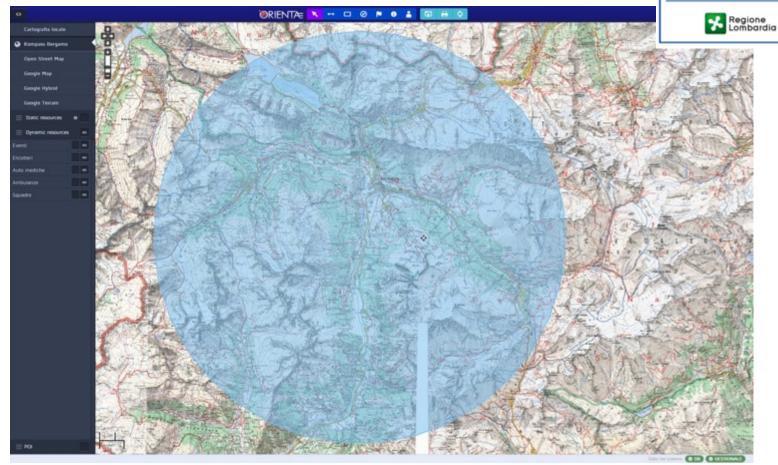




Location, Location, Location



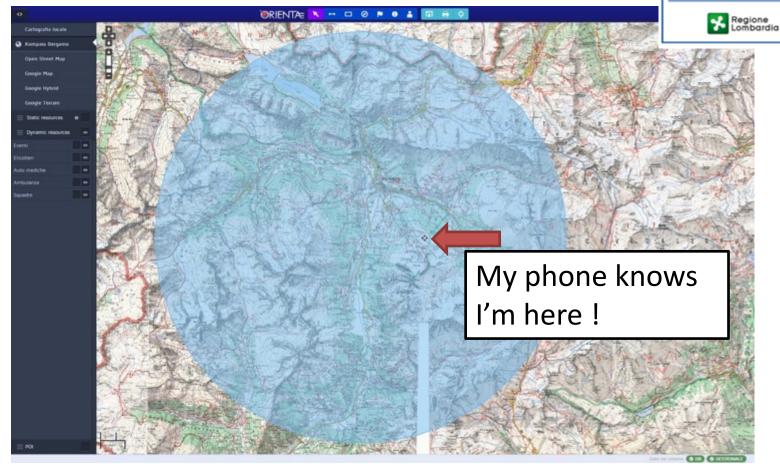
Cellular-based location is useless (>20km radius)



Location, Location, Location



Cellular-based location is useless (>20km radius)





One Image is Worth One Thousand Words !!



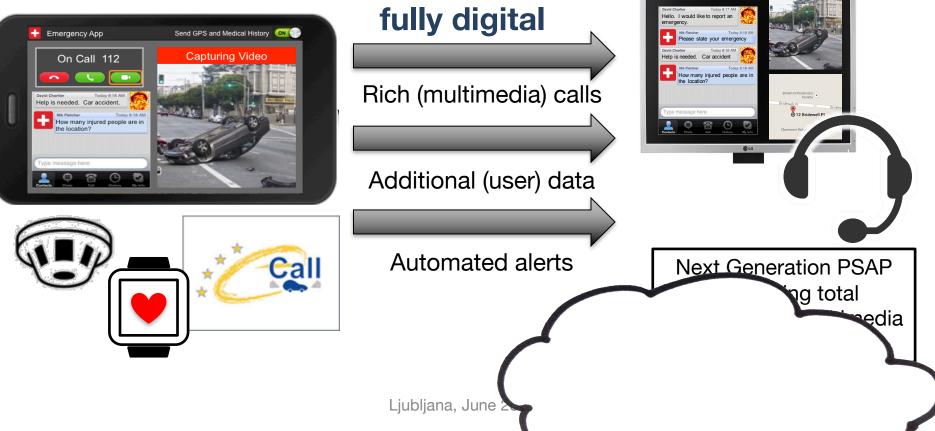
Source: 24ur.com

The NEXES Solution



NEXES proposes to exploit Internet-enabled and smart mobile technologies to assist emergency services and citizens

Total Conversation





NextGeneration 112 Solution based on PEMEA and WebRTC

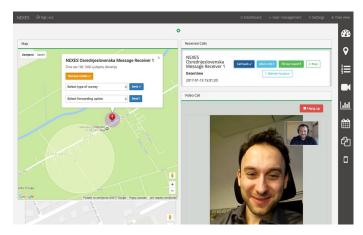


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 653337.

Solution building blocks

- 112 Mobile Application
 - NEXES WebRTC App
- Application Provider (AP)
 - backend server with LIS function
- PEMEA Network
 - Supporting roaming capabilities
 - ASP and PSP elements with the emergency Call Routing
- NEXES PSAP (112 Center)
 - With PEMEA network and WebRTC support

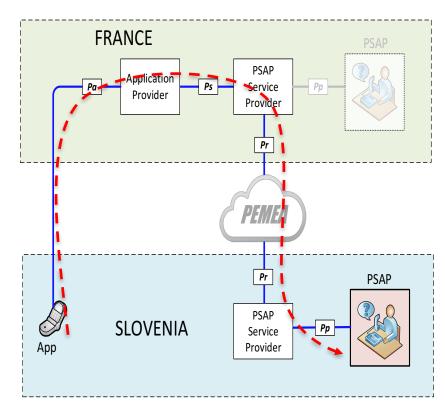




PEMEA – emerging standard from EENA

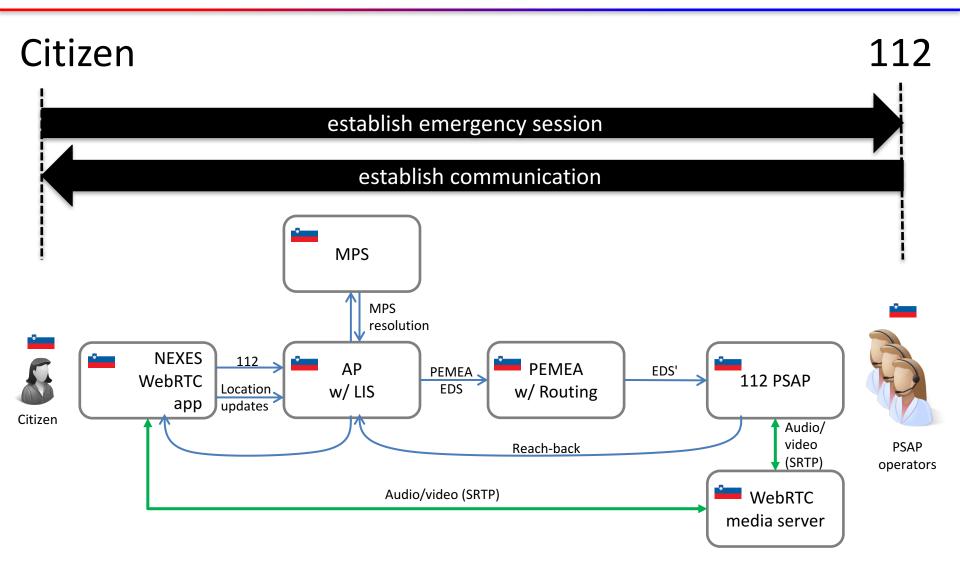
- Application pushes location and user data to the AP server
- AP formats data into PEMEA emergencyDataSend (EDS):
 - User-id
 - Initial Location
 - Reference to user data
 - URIs for invoking PEMEA extensions
- EDS transitions through PEMEA network to terminating PSP and finally destination PSAP

Case for helping French tourist in Slovenia



Solution architecture







- End-to-end WebRTC video call capabilities
- Chat messaging
- Enhanced location (phone and network provided) with location updates
- User and contextual information delivered to 112 Center, including medical information
- Extending the 112 concept with surveys
- International 112 App roaming: PEMEA endto-end emergency message routing



NEXES Mobile Application



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 653337.

- Location, location, location
 - GNSS positioning (GPS,...)
 - WiFi positioning
 - Cell tower positioning provided by the MPS system from the mobile operator







Detailed user profile

| 🗆 N 🗄 | ⊖ ▼⊿ 🗎 4:23 | | ⊖ ♥∡ ∎ 4:24 |
|--|--------------------|-------------------------|-------------|
| NEXES Wel | oRTC Profile | NEXES Web | RTC Profile |
| Name: | Citizen 3 | | |
| | enter family name | Emergency contact: | - |
| ଦି Sex: | ○ FEMALE | Blood type: | A+ |
| | MALE | Medical conditions: | Diabetic |
| 🖀 Address: | enter home address | 💩 Doctor: | None listed |
| Address: | enter work address | | Туре2 |
| Y Date of birth: | | notes: | |
| * Phone number | enter phone | 🟦 Allergies: | None listed |
| | | (Medications: | Insulin |
| 🔯 Language: | French | ♥ Organ | • YES |
| Emergency contact full name: | enter full name | donor: 🍂 Disability: | <u>О</u> NO |
| 😻 Relationshin: | _ | ⊷r Disability: | |
| | | | |

20



Media upload – picture and video

| ■ N II NEXES WebRTC | 9 ⊖ ▼⊿ 🗎 4:26 | N I ♀ ♥ ↓ ↓ 4:26 NEXES WebRTC |
|---------------------------|---------------|--|
| Capture Image | | Capture Image |
| Capture Video | | Capture Video |
| Attach file | | Attach file |
| ✓ VID_20170410_162616.mp4 | | Successfully uploaded! Successfully uploaded to server. GO BACK SEND ANOTHER |
| ► Send | | |
| | | |

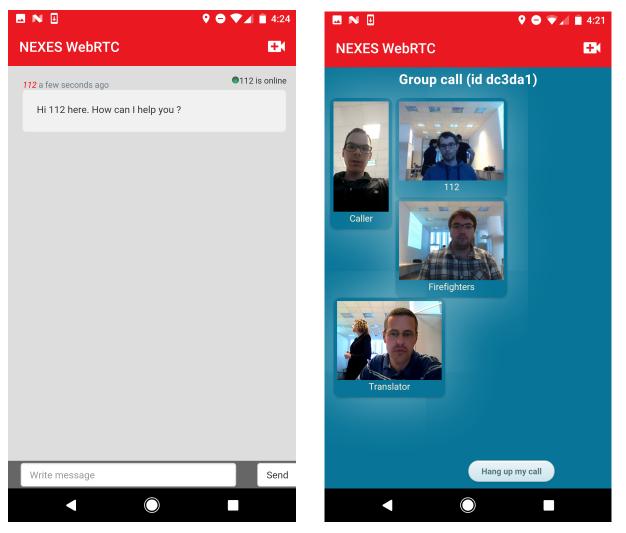


Full-featured web view – predefined survey

| ■ N I | N 🗄 🙋 🛛 🗘 🖗 🗐 10:14 |
|------------------------|---|
| NEXES WebRTC + | NEXES WebRTC 🛨 |
| | |
| NEXES Ljubljana PSAP | Flood survey |
| has received your call | Please help us assess the impact of the flood |
| | Status of the facility |
| | • Facility is flooded |
| | O Facility water |
| | O Facility mud |
| | |
| | Amount of water |
| | Less than 30cm |
| | O More than 30cm |
| | Electricity |
| | |



Full-featured web view – chat and video call





NEXES PSAP



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 653337.

PSAP Dashboard with WebRTC cal

| NEXES C+ Sign out | | 幸 Dashboard 🛛 🐵 User management 🖉 Settings 🖡 | ∽ Tree view |
|---|---|--|--------------------|
| | 0 | E | æ |
| Мар | | Received Calls | |
| | NEXES Osrednjeslovenska Message Receiver 1 Črna vas 128, 1000 Ljubljana, Slovenija Remove marker ✓ Select type of survey Select forwarding option Send ✓ | NEXES Osrednjeslovenska Message Receiver 1 Date/time 2017-01-13 15:01:20 | |
| Črna vas | Hadouta gostinstvo in turizen: doo Crna ¹⁰⁵ Crna ¹⁰⁵ Crna ¹⁰⁵ Crna ¹⁰⁵ Crna ¹⁰⁵ Crna ¹⁰⁵ Crna ¹⁰⁵ Crna ¹⁰⁵ Crna ¹⁰⁵ Crna ¹⁰⁵ | Hang up | ⊡ ∰ ℃ |
| no vo ^s ents Trnulja Google | android_wifi Radius: 18.150999069214 mps_location Radius: 487 Podatki na zemljevidu ©2017 Google Pogoji uporabe Javi napako zemljevida | | |

| medical_data | object | | | |
|------------------------|-----------------|---------------|---------|------|
| | blood_type | | A+ | |
| | allergies_and_r | eactions | - | |
| | medical_notes | medical_notes | | |
| | medications | | - | |
| | medical_conditi | ons | - | |
| | organ_donor | | YES | |
| | | | | |
| user_data | object | | | |
| | first_name | Janez | | |
| | last_name | SONY | | |
| | sex | MALE | | |
| | date_of_birth | 2/1/70 | | |
| | home_address | Sony dr | ive 1 | |
| | work_address | Trzaska | cesta | 25 |
| | phone_number | 386317 | 50459 | |
| | | | | |
| emergency_contact_data | object | | | |
| | relationship | mother | | |
| | full_name | [empty s | string] | |
| | phone_number | Test1 - C |)1 476 | 81 (|
| capabilities | | | | |
| | object | | | |
| | webrtc TRUE | | | |
| | camera TRUE | | | |

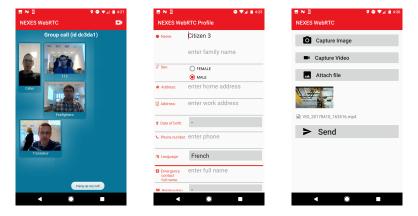
| object | |
|---------------------------|---------------------------|
| local_ipv4_address | 192.168.144.228 |
| local_ipv6_address | FE80::D022:BEFF:FE3D:8C45 |
| msisdn | +38631750459 |
| imei | 358194053226493 |
| wifi_mac | D0:22:BE:3D:8C:45 |
| wifi_ssid | LTFE |
| battery_level | 76 |
| cell_id | 2714144 |
| sim_operator_number | 29341 |
| sim_network_operator_name | Mobitel |
| sim_subscriber_id | 293413010519473 |
| sim_line_number | +38631750459 |
| sim_network_country_iso | si |
| sim_current_state | SIM_STATE_READY |
| sim_serial_number | 8938641160315194738 |
| mobile_network_number | 293-41 |
| mobile_network_name | MOBITEL |
| device_id | 358194053226493 |
| is_network_roaming | [empty string] |
| ping_rtt_ms | 66.485 ms |
| dl_speed_kbps | 4.59 Mb/s |
| ul_speed_kbps | 17.35 Mb/s |
| measure_type | WIFI |
| measure_timestamp | 2017-01-16 16:42:56 |
| network_type | WIFI |

context

Benefits of the solution



- Total conversation
 - Multimedia
 - Chat
- Enhanced location
 - GNSS, Wifi, MPS
- Sharing user data
 - personal and medical
- Pan-EU solution
 - enables international roaming of the users/app
- Based on the state-of-the-art technologies
 - Enables sharing of the collected data (112) with ERO







Thank you!

University of Ljubljana Faculty of Electrical Engineering Trzaska cesta 25 1000 Ljubljana

janez.sterle@fe.uni-lj.si