FREQUENTIS

FOR A SAFER WORLD

New and Innovative Technologies in Emergency Calling

Wolfgang Kampichler, SIPNOC 2018

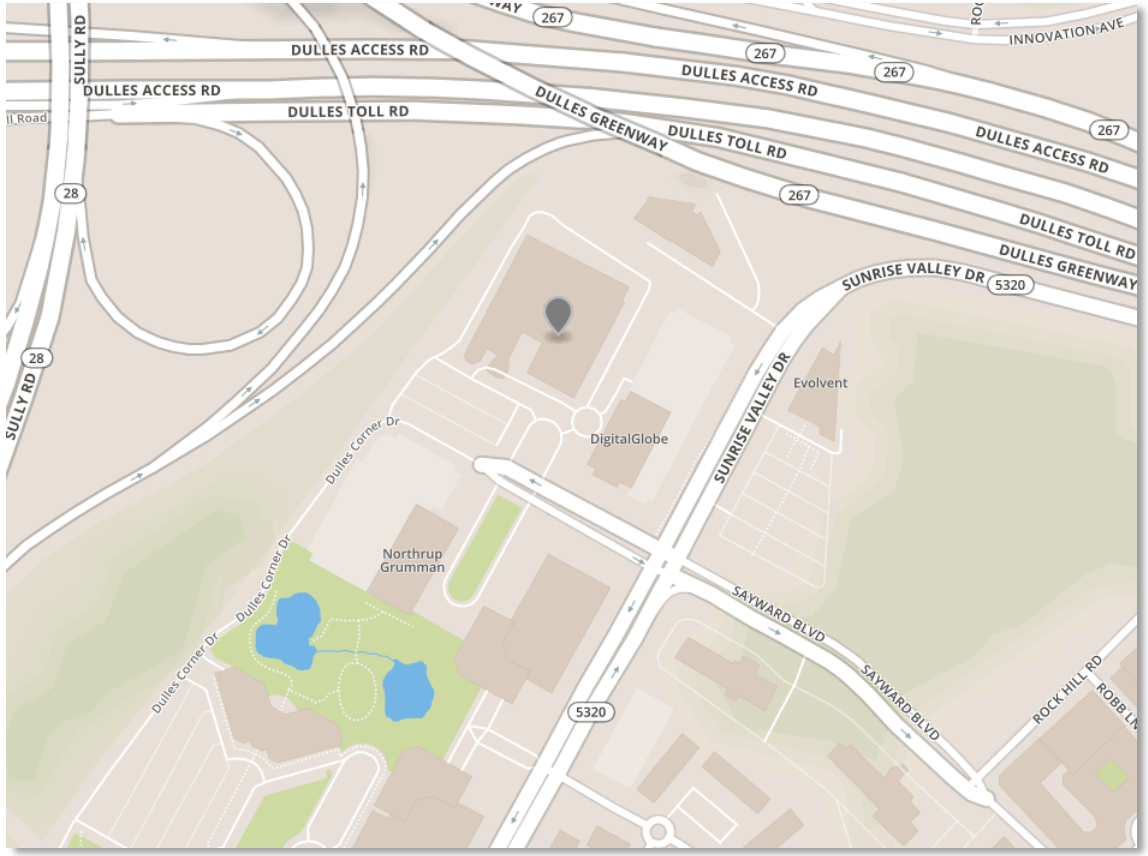
Mobile Communication And Location Based Services

A Smartphone knows where you are
… GNSS, WLAN, network…

Some of your Apps may already use your location …

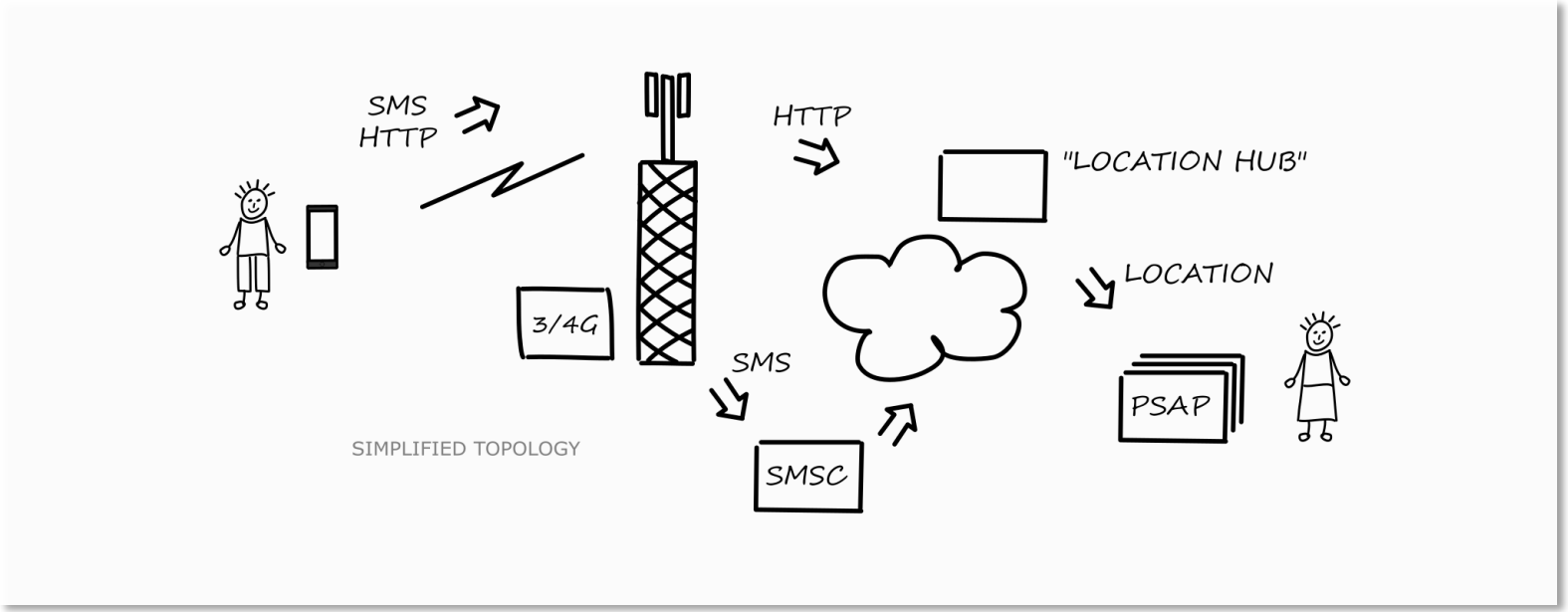
Control Rooms may not have access the most accurate location

- How to get location?
- How to convey location?



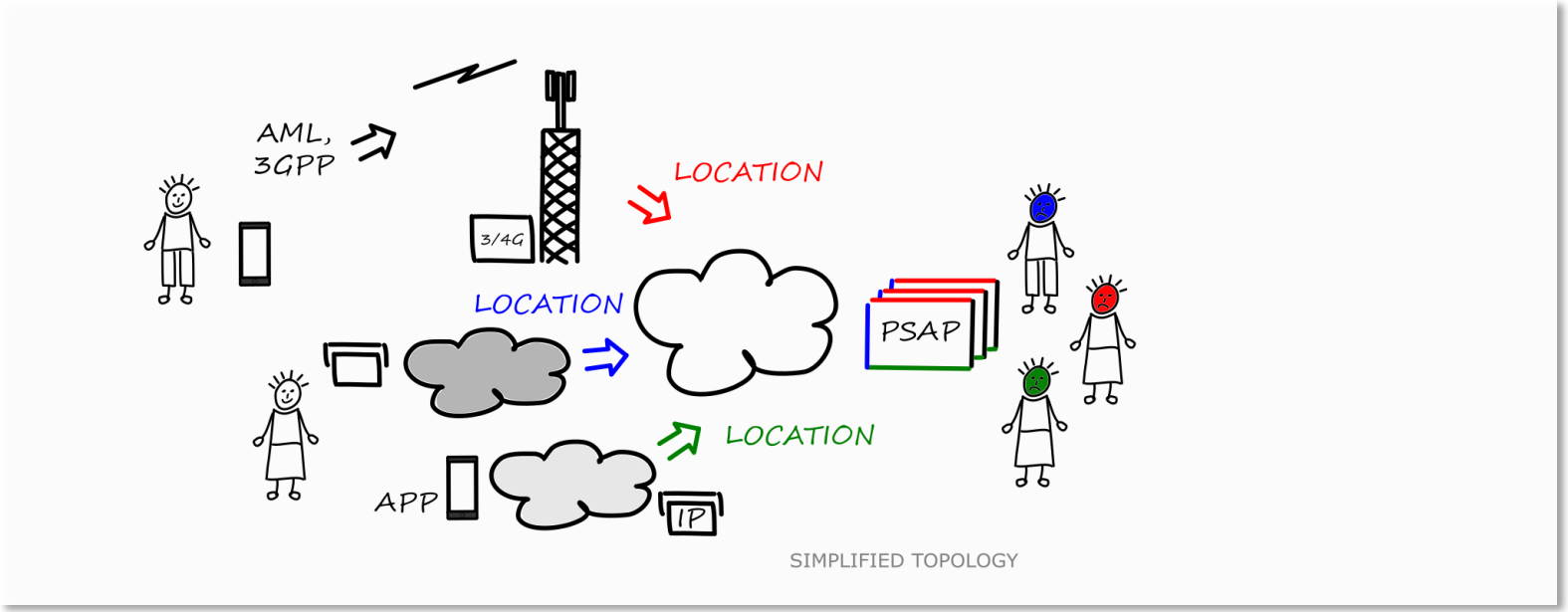
geojson.io

Advanced Mobile Location (AML)



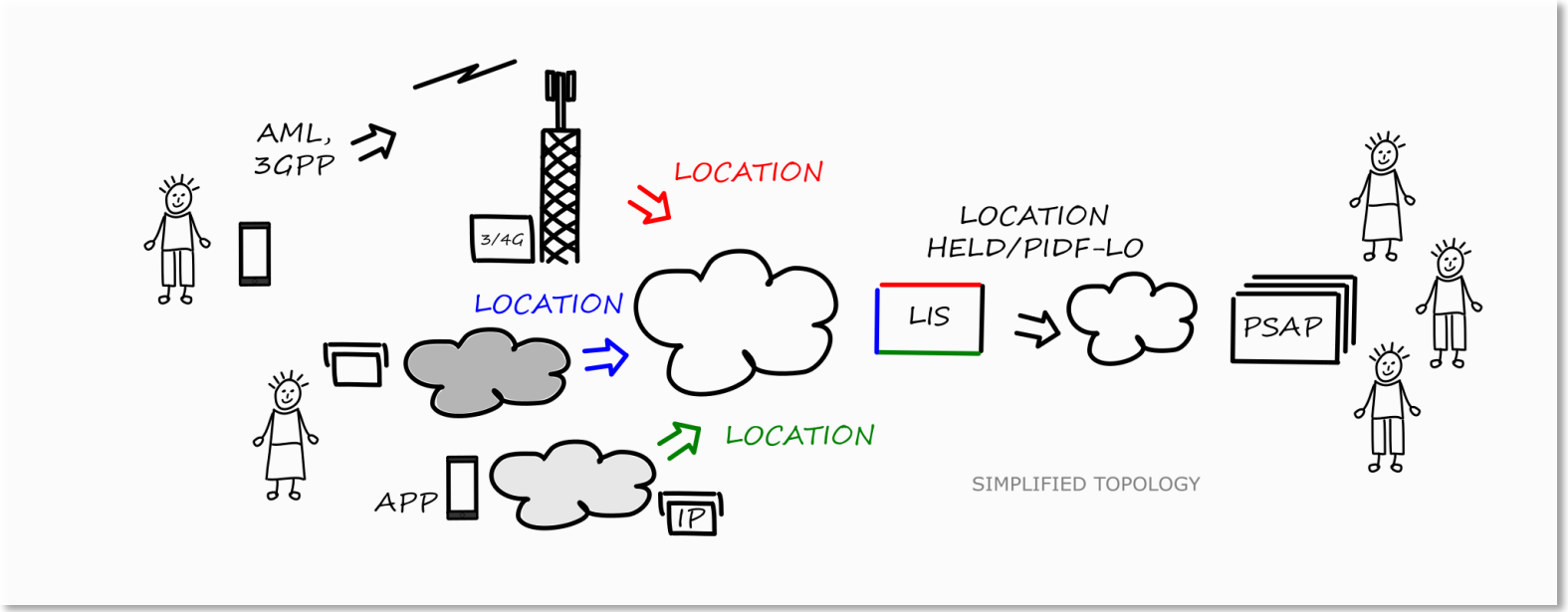
- Automated location conveyance in the case an emergency call is initiated
- Silent activation of location methods and SMS or HTTPs push message
- Initial initiative of BT (EE, O2 & HTC) in UK - supported by EENA and later extended to other countries (EU and recently US)
- Implemented by Google (Android) … Apple (iOS) followed
- ETSI SC EMTEL has started a work item on standardization of AML

Location Information



- Location conveyance may require the support of different interfaces
- Specific to the access network or proprietary (lets say, specific to a country)
- PSAPs may have to implement certain interfaces, but there might be a better solution …

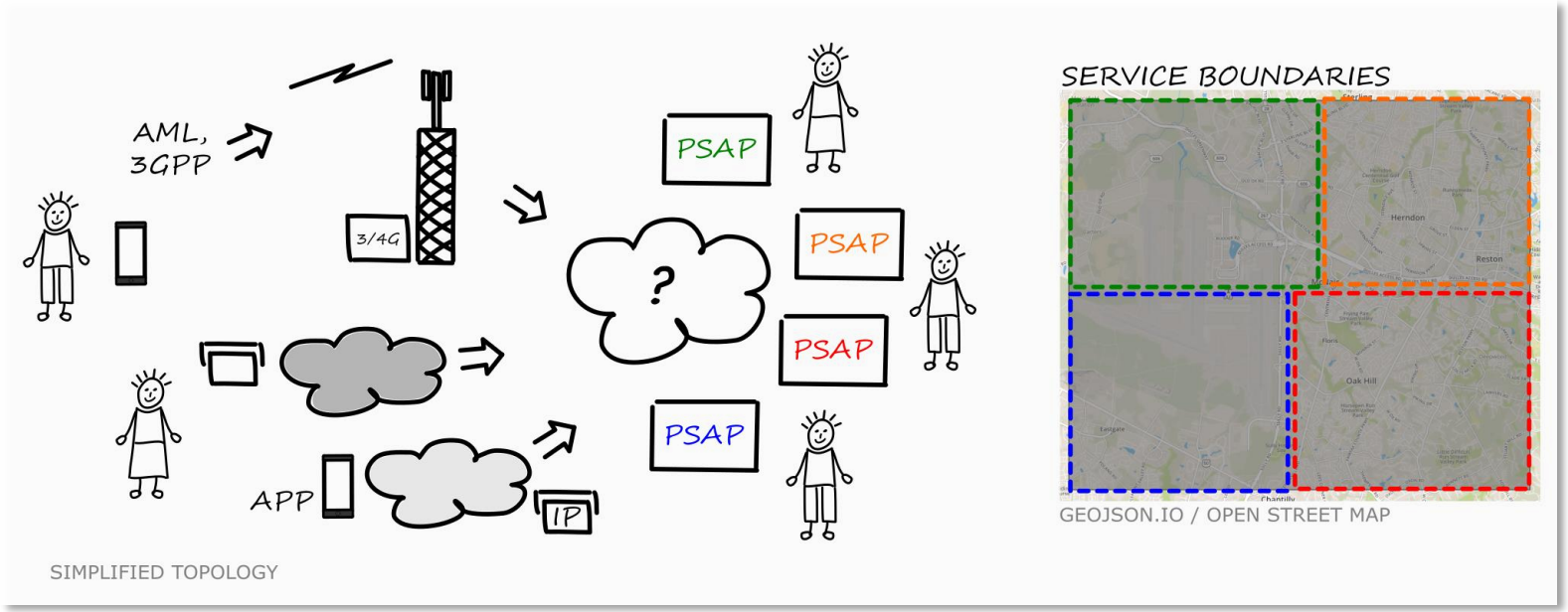
Location Information Server



- LIS as central location hub to adapt different location methods
- May support several location interfaces (AML, 3GPP, HELD, …)
- Authorized PSAPs query location via single interface (HELD/PIDF-LO)
- LIS … Location Information Server (ETSI TS 103 479*)
- HELD … HTTP enabled location delivery (IETF)
- PIDF-LO … Presence Info Data Format – Loc. Object (IETF)

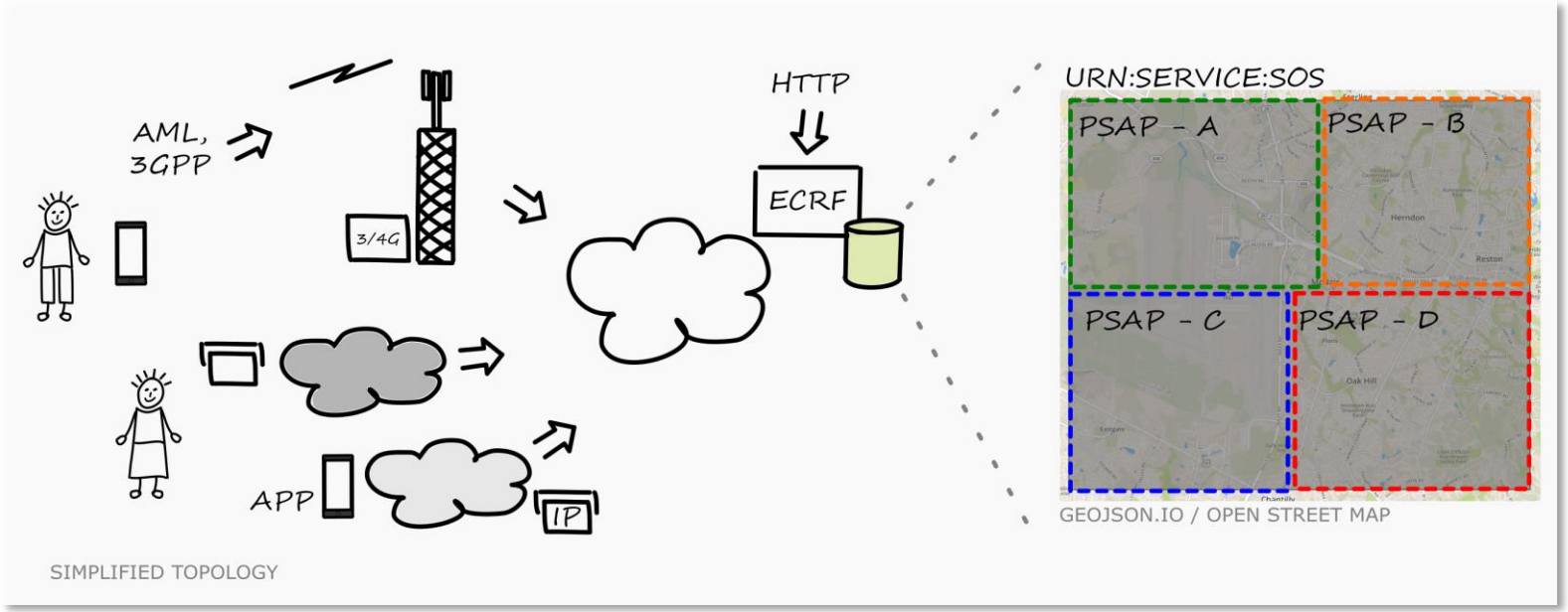
* to be published in 2019 ☺

Location Based Emergency Call Routing



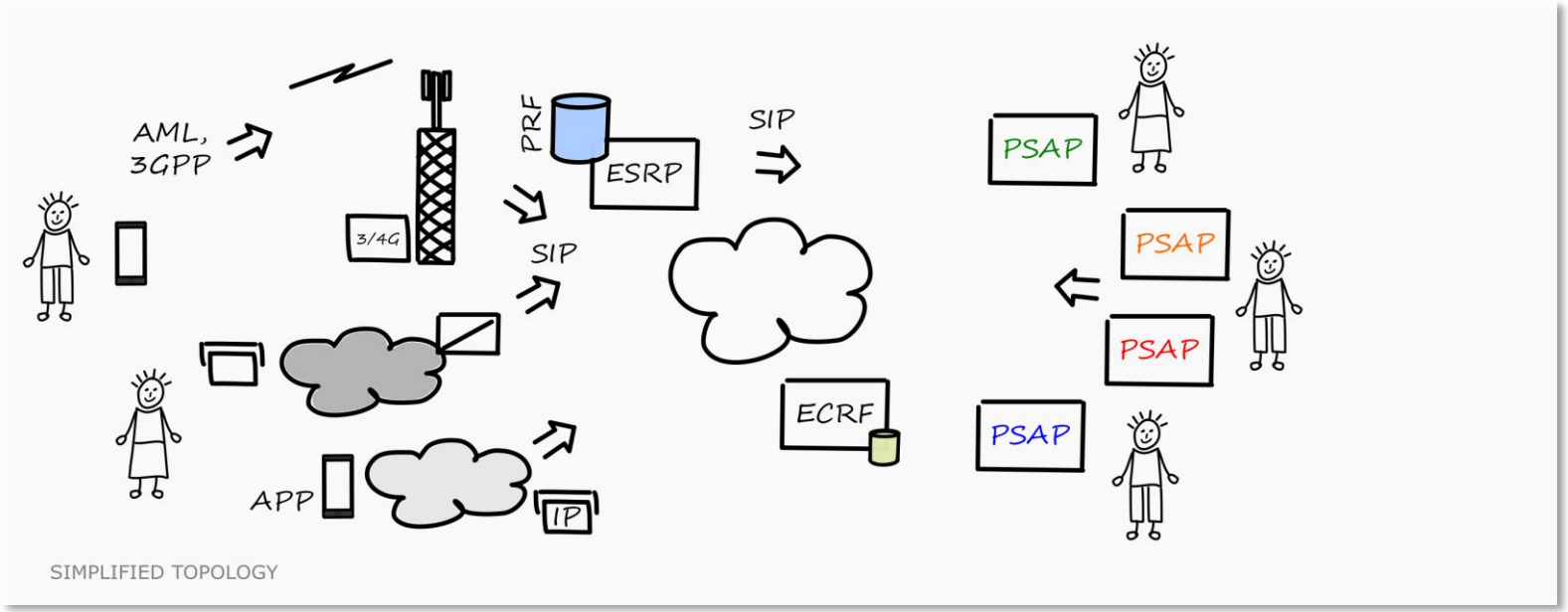
- Emergency calls may originate from different access networks …
- PSTN (2G/3G), VoLTE (IMS: E-CSCF / LRF), VoIP, Enterprise (UC, WebRTC)
- Area codes probably won't work for emergency call routing in any case …
- If PSAP service boundaries are defined by polygons (geographical area), a
- Mapping function may return the proper PSAP address (dial string or URI)

Emergency Call Routing Function (ECRF)



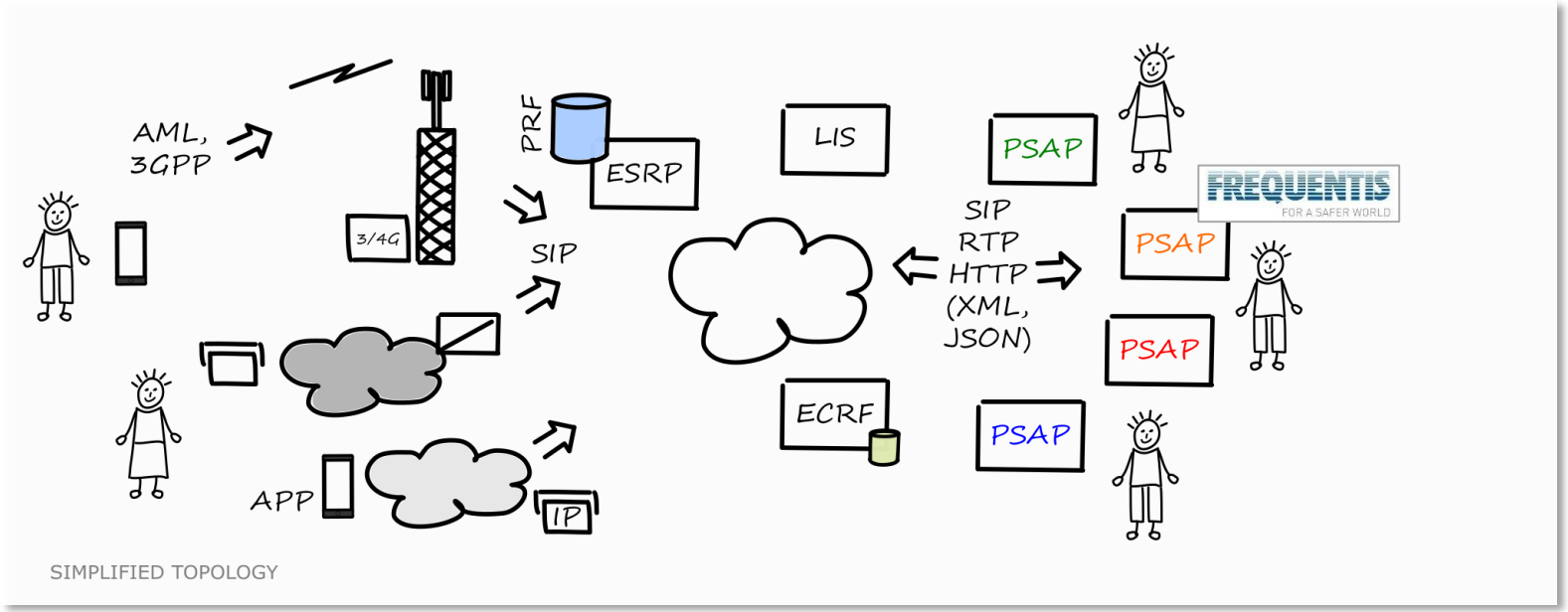
- NG core service as defined by NENA i3 and ETSI TS 103 479*
- LoST protocol server where location information and a service URN serve as input to a mapping function that returns a URI to route emergency calls
- GIS database (stores polygons and mapping) combined with HTTP interface
- LoST … Location to Service Translation (IETF)

Emergency Services Routing Proxy (ESRP)



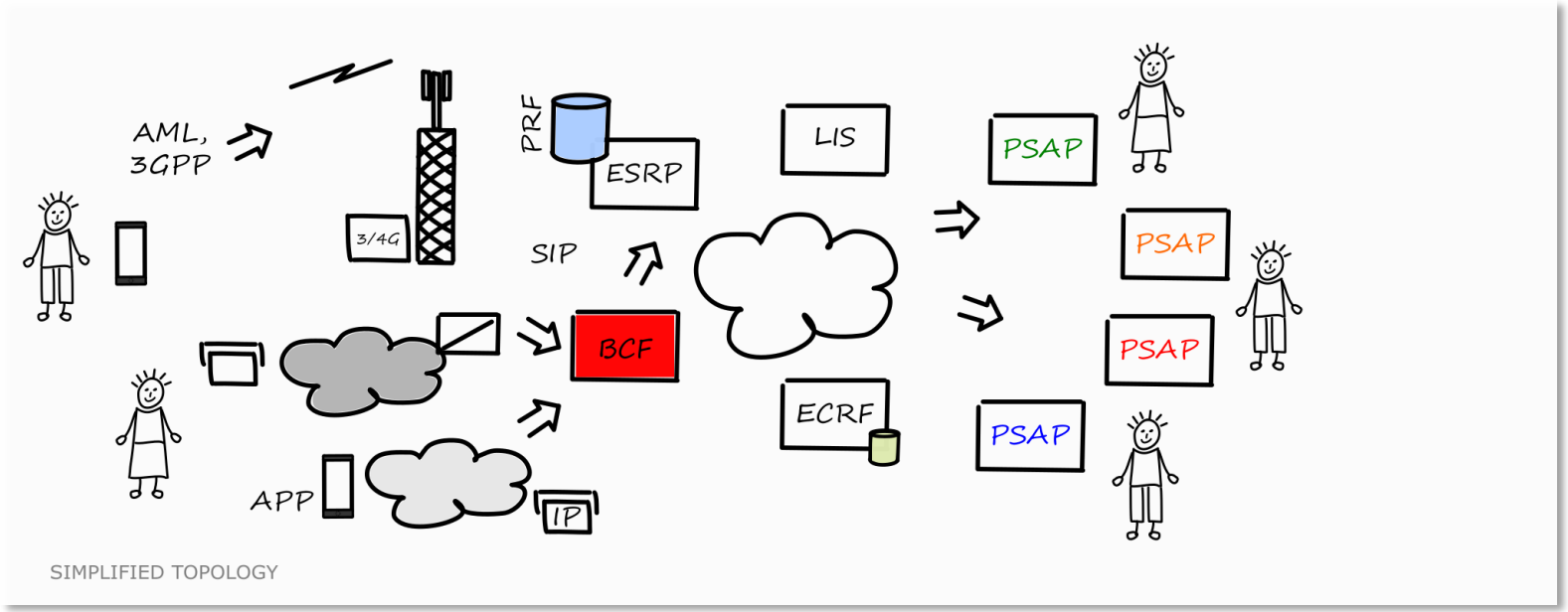
- NG core service as defined by NENA i3 and ETSI TS 103 479*
- SIP (Session Initiation Protocol) proxy that selects the next hop routing based on location, service URN (via ECRF) and policy
- May include a PRF (Policy Routing Function) to evaluate rules for policy based routing: e.g. time-of-day, number of calls, …
- PSAPs register for de-queuing emergency calls

Public Safety Answering Point (PSAP)



- PSAP interface as defined by NENA i3 and ETSI TS 103 479*
- Control rooms receive inputs from different access networks and different provider … the aim of standardization is to provide a single entry point that …
- Includes location, signaling, media, additional data or specific events
- Events are used to notify other elements (security posture, queue state …)

Border Control Function (BCF)



- NG core service as defined by NENA i3 and ETSI TS 103 479*
- Application Layer Gateway and PoI (Point of Interconnection)
- Protocol sanitizing and topology / feature hiding (e.g. call transfer)
- Secure entry plus additional functions to mark / block specific call sources

Who is looking into this?

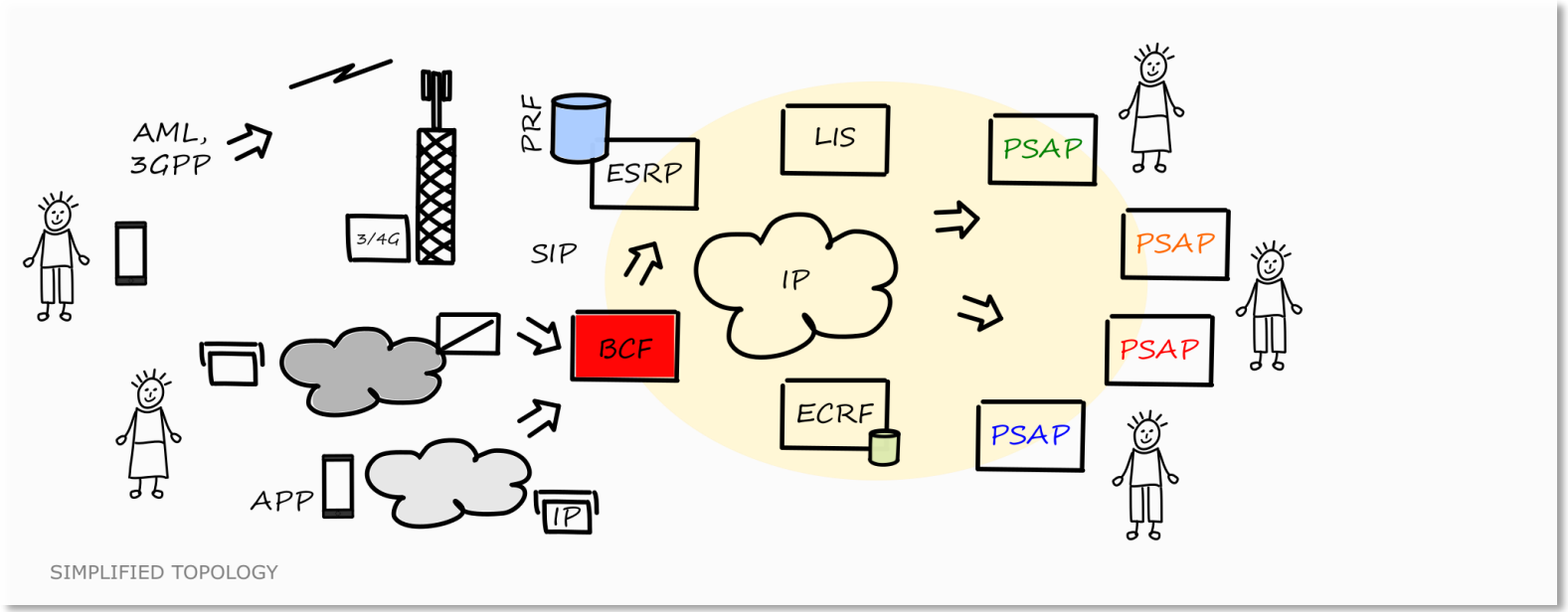
- Internet Engineering Task Force (IETF)
  Emergency Context Resolution with Internet Technologies, ECRIT …
  anticipates a close working relationship with NENA, EENA, 3GPP, and ETSI

- NENA
  NG9-1-1 Core Services specification
  https://www.nena.org/?page=i3_Stage3

- EENA
  Next Generation 112 Long Term Definition
  http://www.eena.org/uploads/gallery/files/pdf/2013-03-15-eena_ng_longtermdefinitionupdated.pdf

- ETSI
  Special Committee Emergency Telecommunications (SC EMTEL)
  http://www.emtel.etsi.org/overview.htm

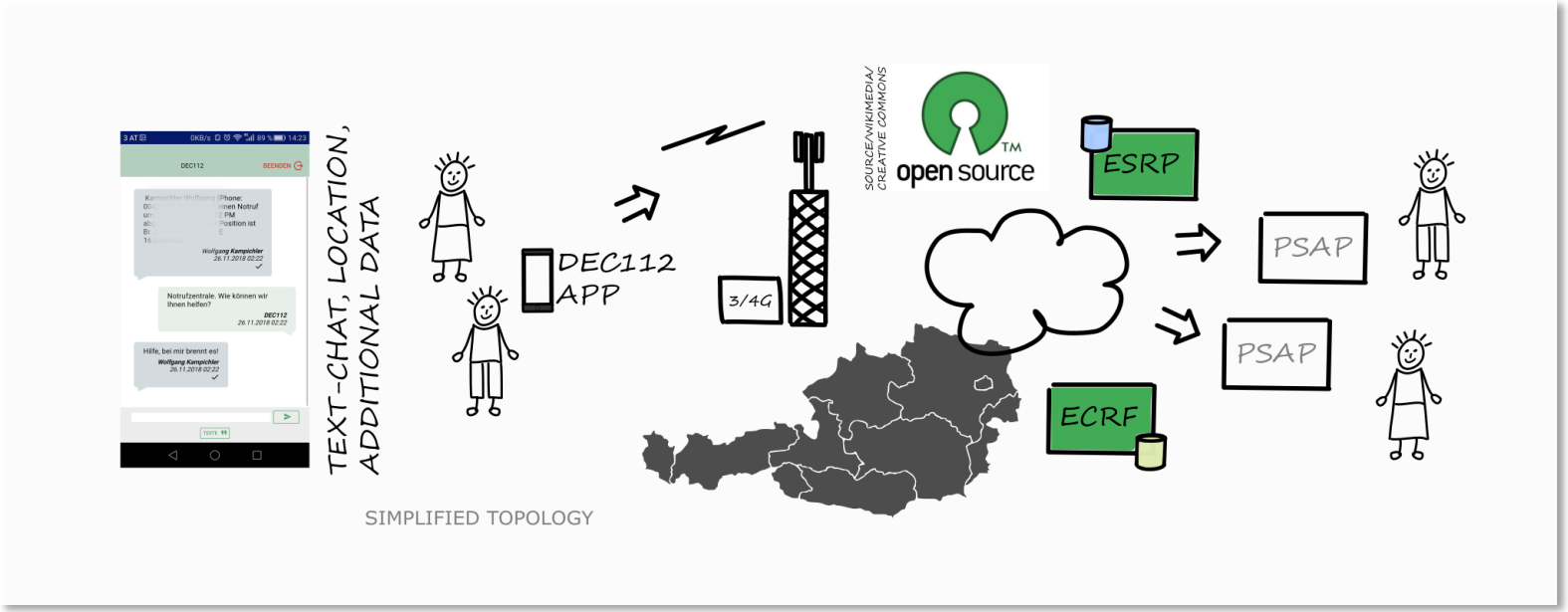
European Standardization



ETSI SC EMTEL Work Items ETSI TS 103 479 & TR 103 480:
Core elements for network independent access to emergency services (TS) and interoperability testing (TR)

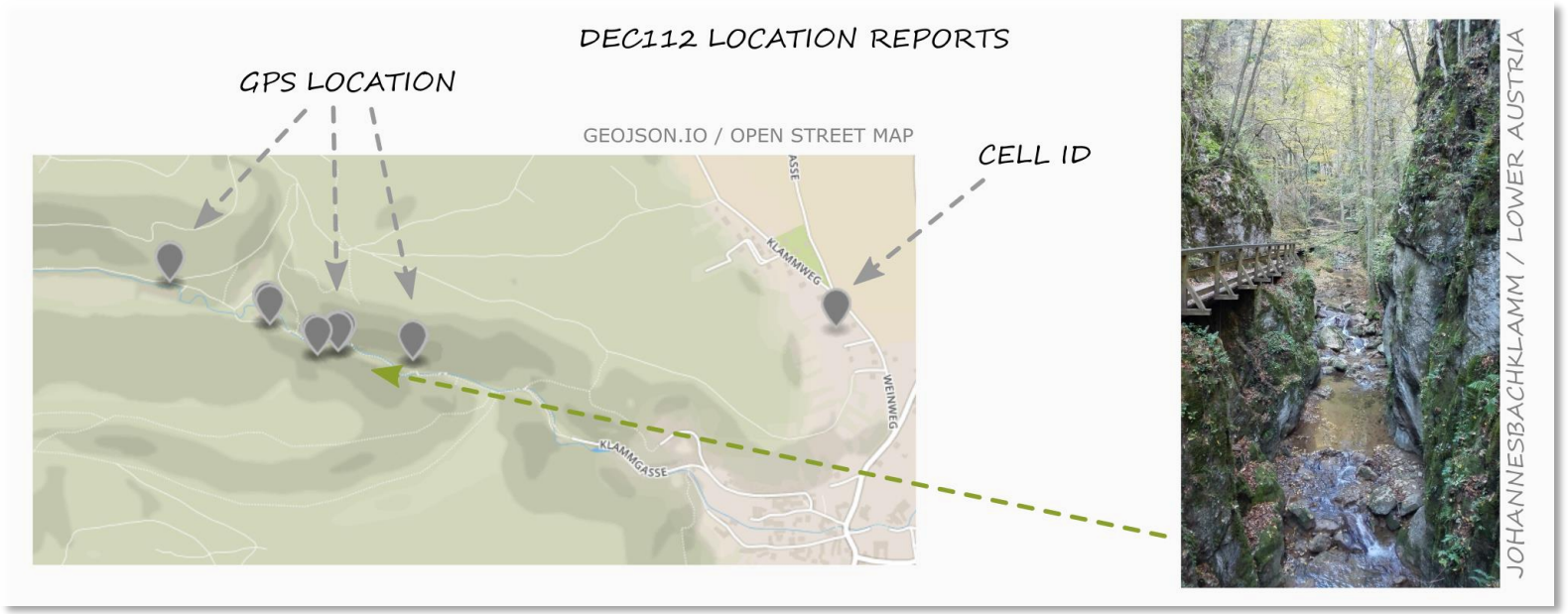
Definition of core elements (BCF, LIS, ESRP, ECRF, PSAP …) and interfaces
Proposed publication: Q1/2019

DEC112 - Text-to-112 Pilot in Austria (Private Initiative)



- Grant: *netidee* Project Call #12 / ProjectID: 2347 / 12/2017 - 03/2019
- Implements standards based Chat-App (Android/iOS), ECRF and ESRP
- 9 Federal States and 3 (or more) EROs per State
- Pilot has started … more information: https://www.netidee.at/dec112 or https://www.dec112.at/
- *netidee* (Internet Foundation Austria) funded projects are open source!

DEC112 - Objectives



- Get better accessibility to emergency services (text messaging)
- Showcase the use of location based (emergency) call routing standards
- Implement core services for next generation emergency calling as open source
- Integrate with Austrian emergency response organizations (122, 133, 144, …)
- App (Android and iOS): registration, location, chat and health data (optional)

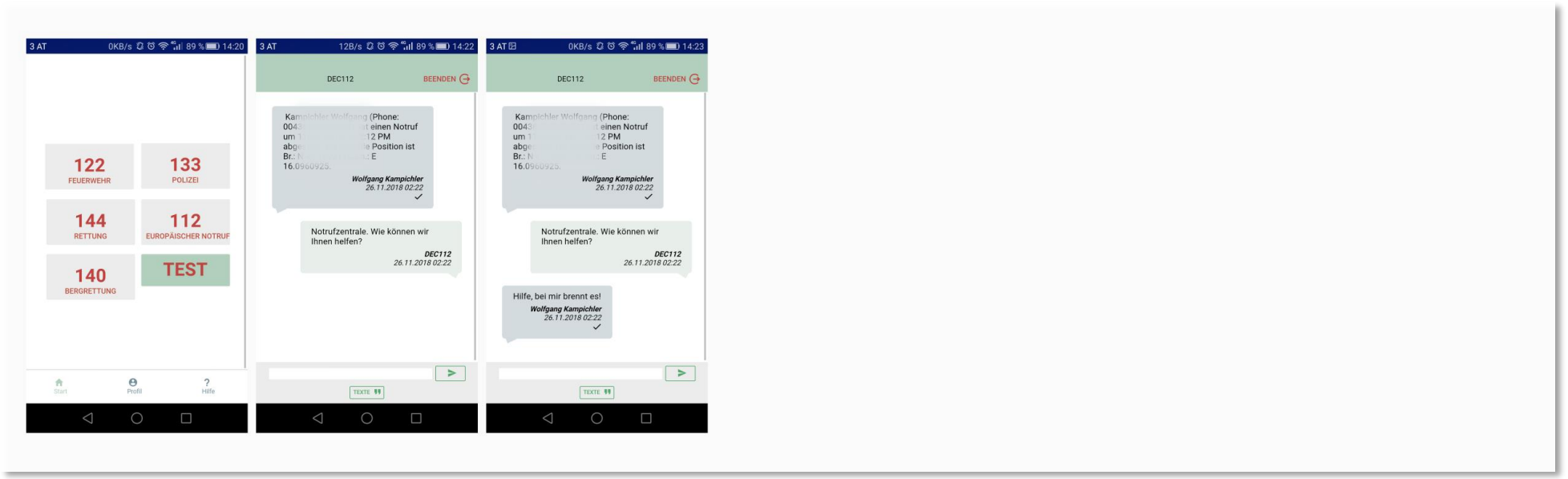
Conclusion

New (innovative) technologies and standards

- support different media types (accessibility)
- efficiently interconnect PSAPs (any PSAP model applies)
- provide location based and policy based routing
- facilitate centralized location services, call routing & mapping, and enable emergency calling from different access networks

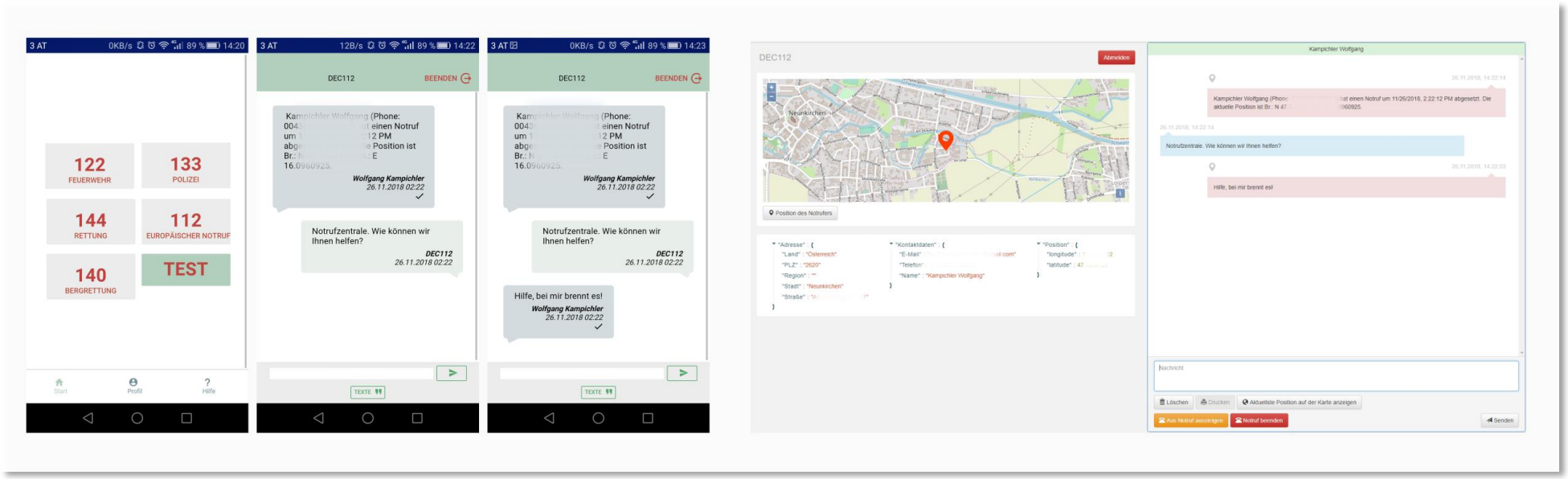
NENA, EENA & ETSI / SC EMTEL are discussing further standardization and EU interoperability testing continues (ETSI Plugtests™ 01/2019)

DEC112 – Live Demonstration



- DEC112 application (SIP SIMPLE chat, PIDF-LO and 2-factor authentication)
- Initial emergency message automatically provides location and additional data
- Location updates are sent every 20 seconds
- Users may select predefined text elements
- SMS to reach emergency services when data connectivity is not available

DEC112 – Live Demonstration



- PSAPs may chose different integration options
  - SIP endpoint (“NG9-1-1/112 interface”)
  - DEC112 gateway + JSON trigger + WebUI (chat window, map, …)
  - DEC112 gateway + WebUI (chat window, map, …)
- Besides technical integration, operational aspects need to be considered

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