



# SAFETY, SECURITY AND PRIVACY IN OUR CONNECTED SOCIETY

IEEE/ICES WORKSHOP ON SAFETY AND SECURITY  
FOR AUTONOMOUS SYSTEMS

Karl Norrman, Ericsson Research Security, 2017

# OUTLINE



- › The Connected Society imply “IT-hacking” moves into our physical world
- › Security/Safety/Privacy are *interacting* areas pulling in different directions
- › Examples from the telecom industry (old, new and yet to come)
- › No answers! – Food for thought

# TELECOM EVOLUTION

- › Until ~2000: Telephony and access are **one and the same**:
  - Application is telephony and access is just to deliver that service/application
- › Then mobile networks provided access to internet
  - Lot's of applications on top, but their security/safety etc is treated separately
  - **Access is the service and has no real inherent safety problems as such**
    - › (well, availability requirements...)
  - **Privacy problems related to access handled**, rest is left to applications
- › Today access is again optimized for different applications
  - **Implies that access security needs to be safety aware and privacy aware also from an application perspective once again**



# SAFETY OR SECURITY OR...



Safety

“Safeurity”

Security

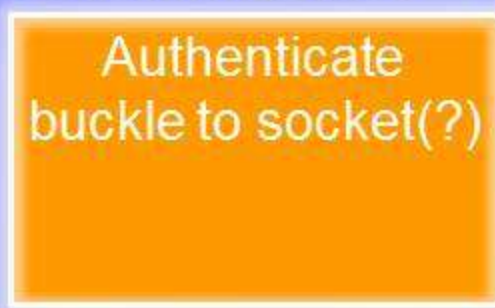
Countermeasure



Countermeasure



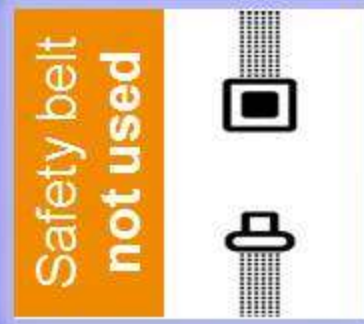
Countermeasure



Threat



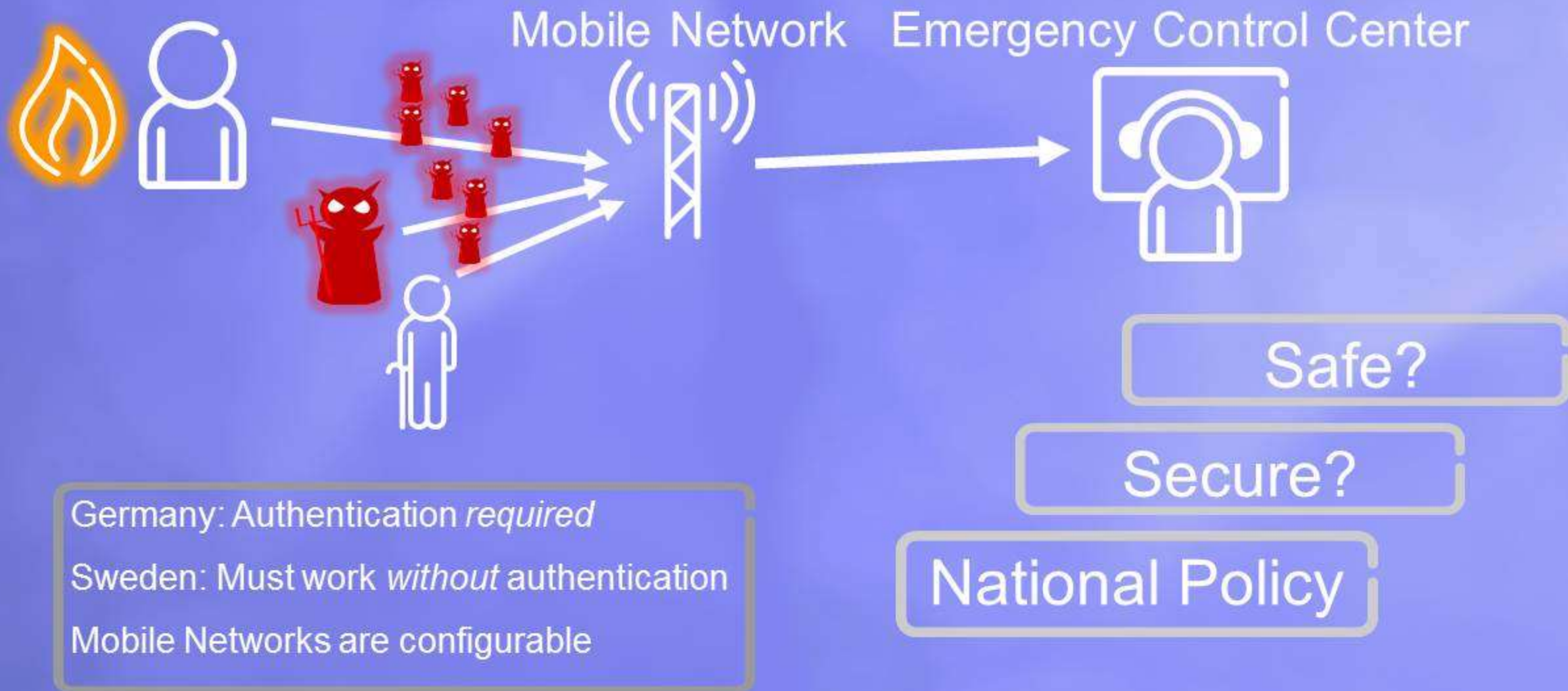
Threat



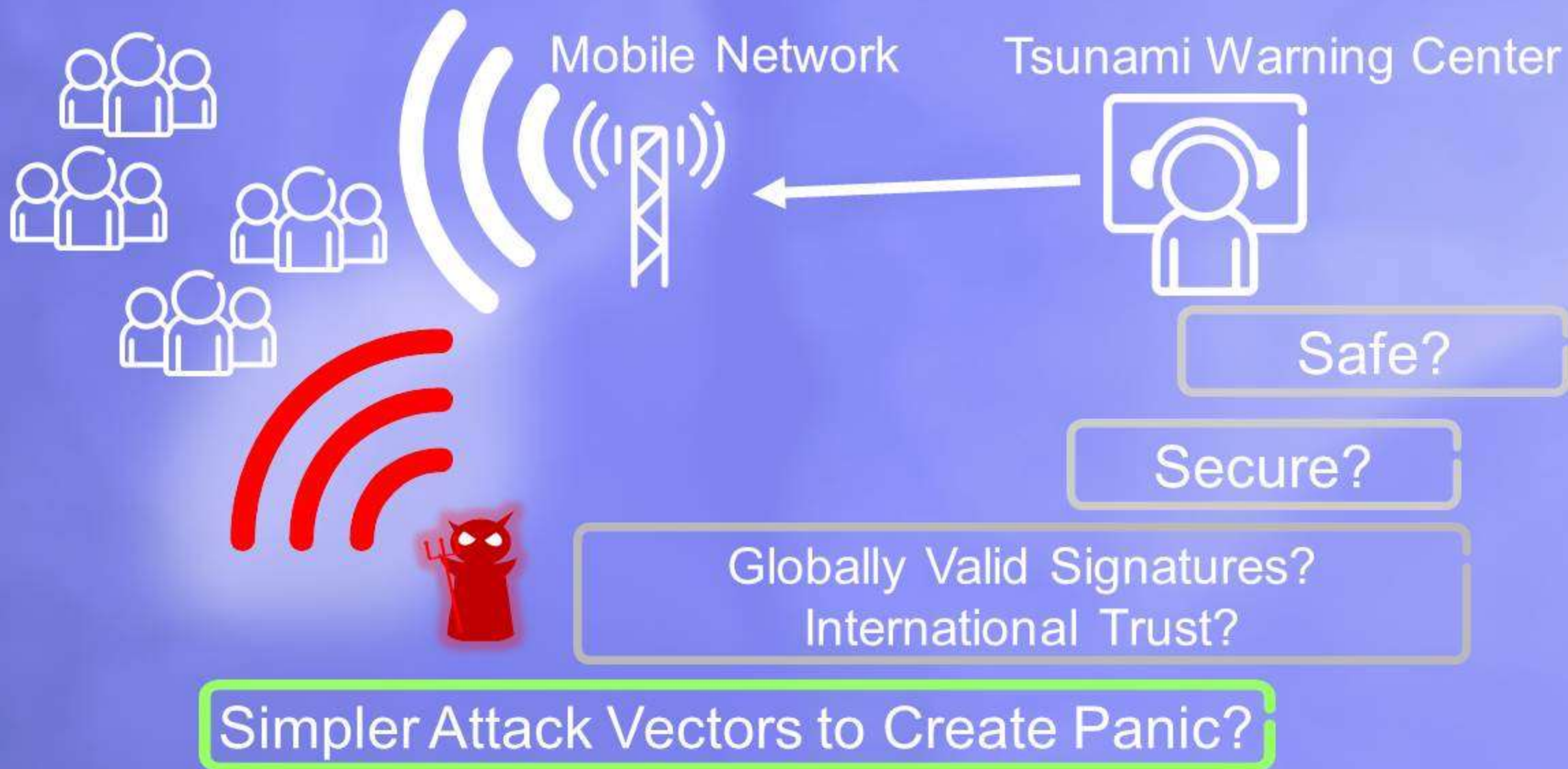
Threat



# EMERGENCY SERVICES



# PUBLIC WARNING SYSTEM



# PRIVACY



- › Even more difficult to define (Regulatory, philosophy, personal expectation, ...)
  - E.g. whitelist vs blacklist?
  
- › Privacy awareness increased severely recently (Snowden, ...)
  
- › Society increasingly share and *want* to share personal data



# PRIVACY AND SAFETY



- › **Safety use case:** Wearable devices broadcast that the owner is a medical doctor
- › In case of emergency a sensor in a shopping mall picks up the signal and announces: “Doctor XYZ, please go to the shoe store. Emergency!”
- › **Great! A saved life!**





# PRIVACY AND SAFETY

- › ...but should doctors be available 24/7 to anyone? Risk for kidnapping or...?
  - Should other occupations be broadcast? Occupation can be controversial to some.
  - What about police...?
- › **Privacy: Not so great! May even mean less safety for some...**
- › 4G adds device-to-device communications
  - For general public and for Public Safety (police etc)
  - Should police mobile phone broadcast that it is a police?
    - › Reveals to criminals that the police is nearby...
    - › May reveal that a lonely policeman is nearby; may get assaulted by criminals
- › 4G added privacy protection for private groups



# AUTONOMOUS BEHAVIOR



- › Safety and Privacy ultimately relates to humans
- › Automatic behavior can be misused by attacker
  - e.g., Revolving doors open when there is a fire (**or an attacker puts a match under the fire alarm!**)
- › The more things become automated, the more we share data with others and machines, the more of our society becomes dependent on this:
  - **The more important it will be that we look at Safety, Security and Privacy jointly from a systems perspective!**

# CONCLUSIONS



- › Securing a safety function often difficult and conflicting
  - Security mechanism lead to risk for unavailability or can be misused by attacker to endanger safety
- › **Observation (is this so in general?):** Safety function itself can often be misused by attacker to endanger safety (e.g., fire alarm at a concert event set off to create panic).
- › Increased public awareness of privacy. Little discussions on privacy relations to safety.
- › **Final Message:**
  - IT/telecom security and privacy now step into the physical world (where safety has been for a long time). Interactions between the three areas will increase.
  - Security and safety communities not interacting sufficiently. Need to increase.
  - Security community somewhat split between privacy conscious/non-conscious (smaller gap, but should decrease)



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