



# 5G-ENSURE

(Project Number— 671562)

5G Enablers for network and system  
security and resilience

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# 5g-ENSURE (H2020)



The reference project for 5G Security, Privacy and Trust

- *Produce a 5G Security architecture and Use Cases*
- *An initial set of Security Enablers for areas in scope (AAA, Trust, Privacy, Security Monitoring , Network Management & virtualisation isolation)*
- *5G Security test bed*
- *Contribute to standards bodies*

















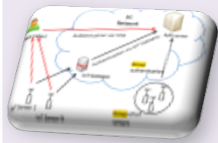
# 5G-ENSURE (H2020): 5G Security enablers

- Have a **product vision** and **features** targeted scheduled over the two releases of the project (v1.0/M11 & v2.0/M22)
  - **Technical roadmap (V1)** released in March 2016
- **Specifications are open**
  - **Open specification** for V1 enablers released in June 2016
- **Software release & documentation**
  - **Release V1** scheduled for September 2016
- **Planned to be integrated and tested on 5G Security testbed**



# 5G-ENSURE: AAA enablers

## IoT enabler



Group-based authentication of devices, to increase the capacity of the current AKA protocol, by minimizing the signaling between the MME and HSS.

## Fine-grained authorization enabler



Basic Authorization in Satellite system  
Basic Distributed Authorization Enforcement for RCDs with simple access control policy and a simple PEP and PDP on RCD side.



# 5G ENSURE: Privacy enablers

## Privacy enhanced identity protection

provide protection against identity disclosure (and, consequently, unauthorized user tracking), by preventing or making more difficult IMSI catching attacks.

## Device identifier privacy

Limit exposure of device identifiers and prior points of attachment, and therefore, limit the ability to track a device.

## *SIM or Device-based Anonymization*

*provide anonymization techniques on the user's UICC (SIM), offering protection against disclosure of sensitive information stored mainly on the SIM.*

## *Privacy Policy Analysis*

*Enables users to analyse the privacy policy of a service or a (V)MNO and compare it to their pre-defined preferences at app install time or 5G connection time*



# 5G ENSURE: Trust enablers

## Trust builder



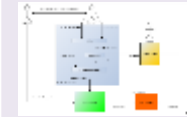
design a 5G system using a trust modelling approach to ensure that threats are minimised and controls are in place

## Trust metric



provide means to achieve 'good enough' security by selecting the optimal security enablers and to enable visibility and configurability of 5G security controls.

## VNF Certification



certify through lightweight process the trustworthy implementation of the VNF and expose its characteristics through a Digital Trustworthiness Certificate.

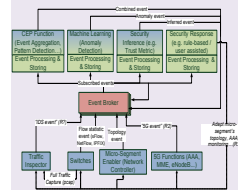


# 5G-ENSURE: Security Monitoring enablers

## Security System State Repository

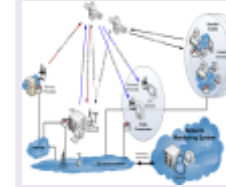
captures the system state in a model that can be visualized and analysed to understand what threats are present and check compliance with the design

## Security Monitor for 5G Micro-Segments



provides a Complex Event Monitoring framework enabling development of use case and treat specific monitoring applications / inference logic.

## Satellite Network Monitoring



provides pseudo real-time monitoring and threat detection in these Satellite and 5G networks systems

## Generic Collector Interface



allows efficient implementation of FastData inside 5G Networks.

## Proactive Security Analysis and Remediation

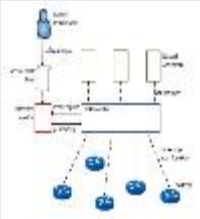


relies on topological data and vulnerability data to compute predictions on ongoing attacks' future steps and effective remediation proposals.



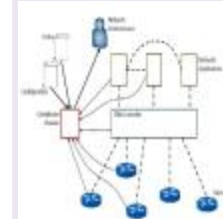
# 5G ENSURE: Network management & virtualisation isolation enablers

## Access Control Mechanisms



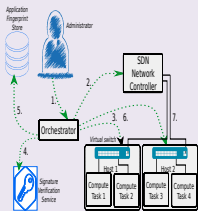
enforce that each network application must be able to only access the information and resources that are necessary for performing its tasks

## Component-Interaction Audits



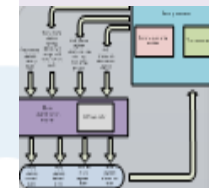
detect noncompliant interactions between network components with respect to given policies

## Bootstrapping trust



*Introduces integrity verification of software on network edge prior to enrolling into the SDN deployment*

## Micro-segmentation

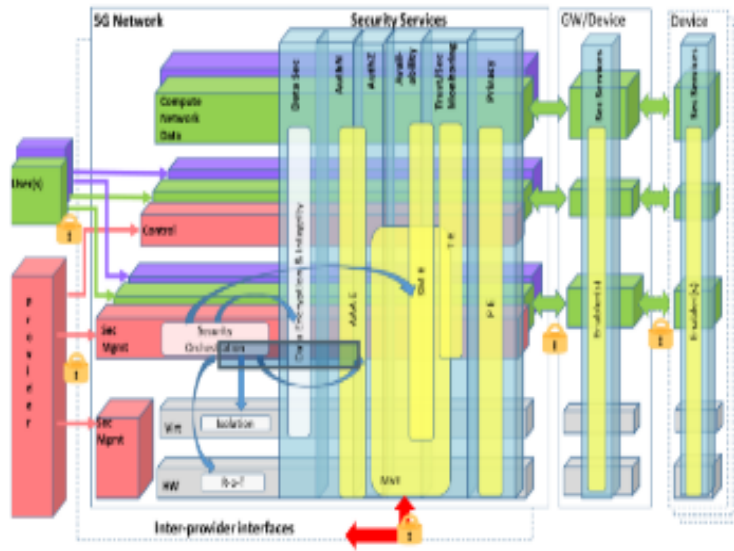


*allows creating secure segments into the 5G network in which granular access controls and strict security policies can be enforced*



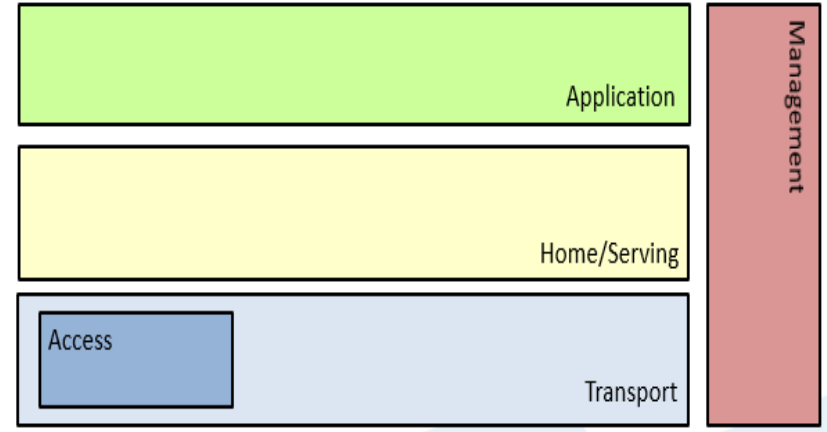


# 5G Security architecture



Initial Architecture using the ITU-T X.805 architecture as a basis

## Stratum



Current working hypotheses (ongoing work)

After a few meeting cycles where we did also look at 5G architecture coming from other 5G-PPP projects (e.g. 5G-NORMA), adopted strategy to try to maximize likelihood of 3GPP adoption

Try to re-use TS 23.101 and 33.401



Read more



5G-ENSURE Deliverables:

<http://5gensure.eu/deliverables>

