MARE

Programmable, Modular and Disaggregated Security Plane for 6G Ecosystems

Dr. Andreas Zalonis

Space Hellas S.A.

MARE project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101191436

Consortium

1. SPACE HELLAS S.A. TELECOMMUNICATIONS, IT, SECURITY SYSTEMS AND SERVICES - PROVISION OF SECURITY SERVICES PRIVATE ENTERPRISE
2. TELEFONICA INNOVACION DIGITAL
3. ATOS IT SOLUTIONS AND SERVICES IBERIA SL
4. ERICSSON TELECOMUNICAZIONI SPA
5. THALES SIX GTS FRANCE
6. HEWLETT PACKARD ITALIANA SRL
7. ORANGE SA
8. AIRBUS DEFENCE AND SPACE SAS
9. NATIONAL CENTER FOR SCIENTIFIC RESEARCH “DEMOKRITOS”
10. TECHNISCHE UNIVERSITAET BRAUNSCHWEIG
11. UNIVERSITAT POLITECNICA DE CATALUNYA
12. CONSORZIO NAZIONALE INTERUNIVERSITARIO PER LE TELECOMUNICAZIONI
13. UNIVERSITY COLLEGE DUBLIN, NATIONAL UNIVERSITY OF IRELAND, DUBLIN
14. NEXTWORKS
15. FOUR DOT INFINITY INFORMATION AND TELECOMMUNICATIONS SOLUTIONS PRIVATE COMPANY
16. XLAB RAZVOJ PROGRAMSKE OPREME IN SVETOVANJE DOO
17. ACCELLERAN NV
18. EIGHT BELLS LTD
19. GIOUMITEK MELETI SCHEDIASMOS YLOPOIISI KAI POLISI ERGON PLIROFORIKIS ETAIREIA PERIORISMENIS EFTHYNIS

6GSNS EUROPEAN PARTNERSHIP Co-funded by the European Union
MARE project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union’s Horizon Europe research and innovation programme under Grant Agreement No 101191436

Main objective

- Create a reliable 6G services provisioning platform through the definition of a **security plane**
  - Built on a well-defined set of **open and programmable security functions**, delivered as enablers to the 6G architecture, in a transparent and multi-domain/stakeholder environment, with the ability to proactively proposing and assessing strategies to efficiently handling novel attacks and threats
- Main contributions:
  - A set of **enriched security functions** – programmable security services to maximize security guarantees (Security Plane)
  - A **smart "pre-assessment" ecosystem**, including simulation, emulation (with network digital twins) and real infrastructure, where security and privacy functions are analyzed prior to production and deployment

6GSNS EUROPEAN PARTNERSHIP Co-funded by the European Union

MARE project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101191436

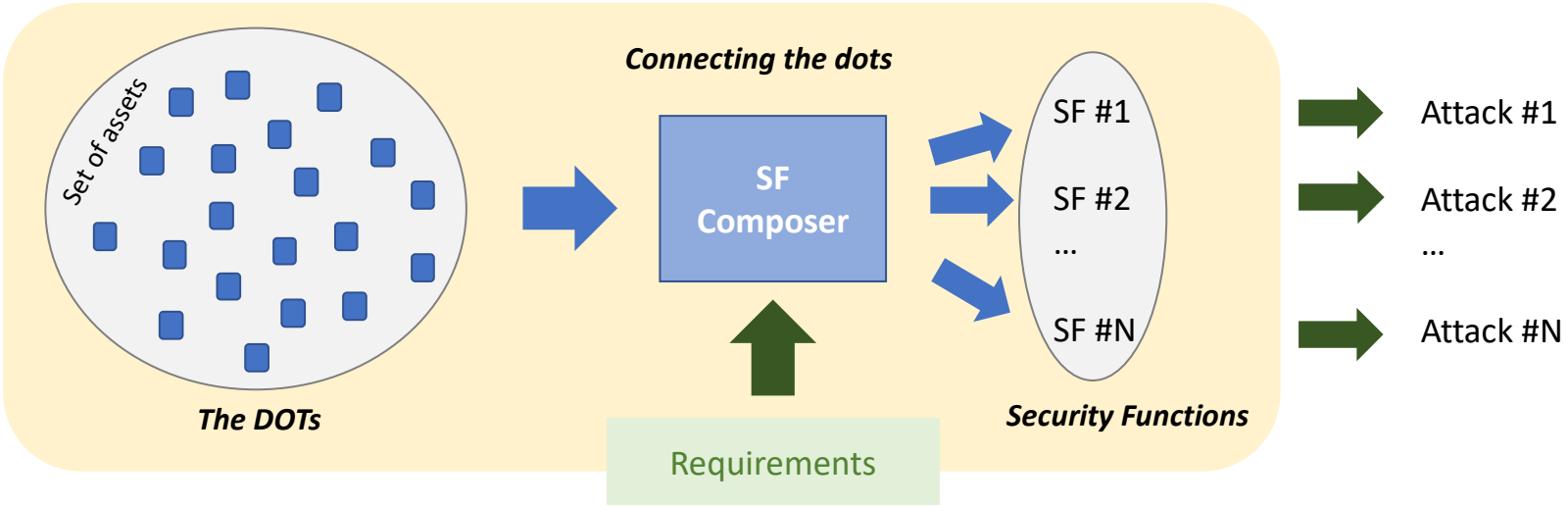
Concept

Current security and privacy framework

Attack #1 →	Req #1 →	Solution #1
Attack #2 →	Req #2 →	Solution #2
…	…	…
Attack #N →	Req #N →	Solution #N

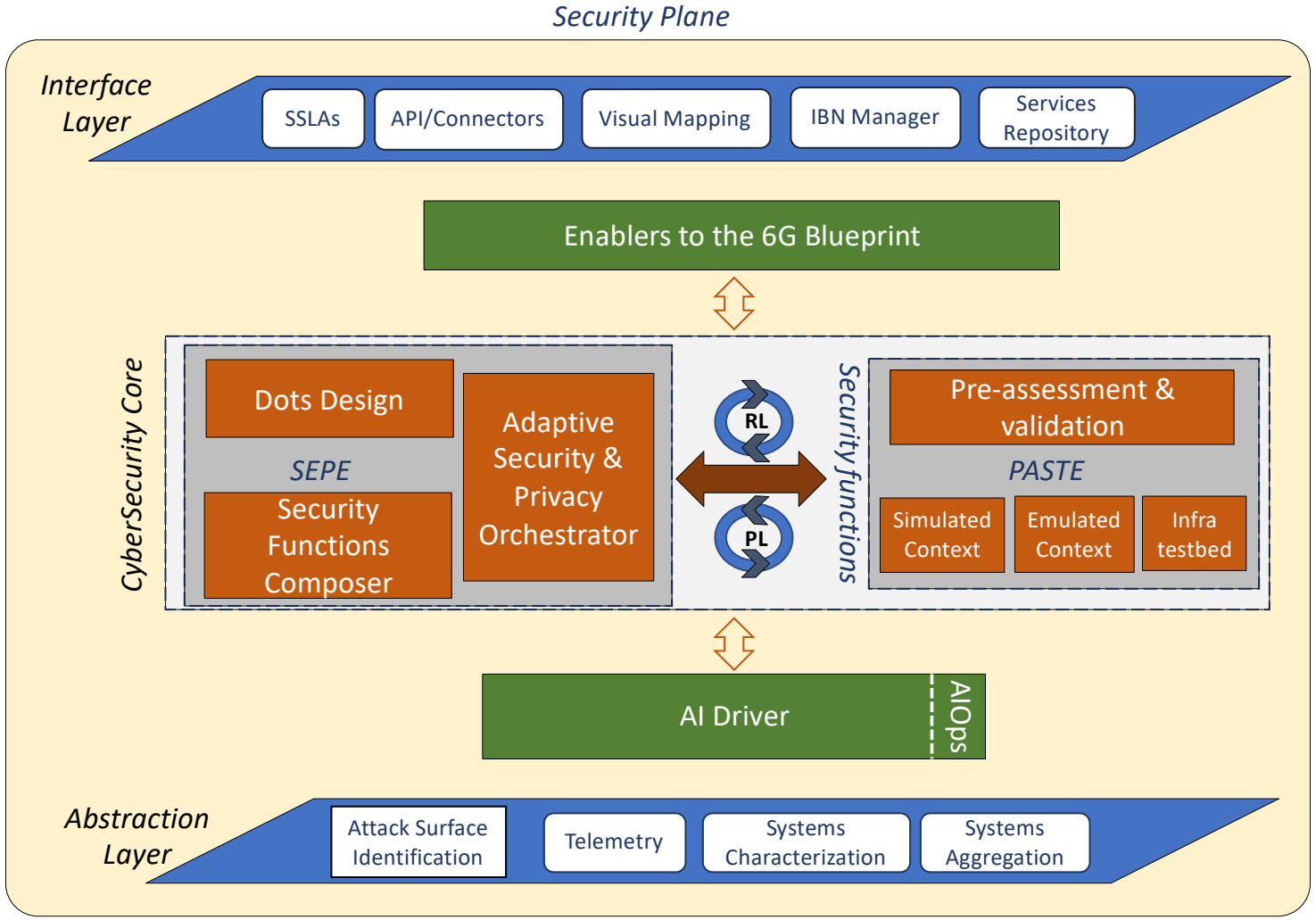
MARE security and privacy plane

Open, modular, scalable, adaptable, interoperable, smart



6GSNS EUROPEAN PARTNERSHIP
Co-funded by the European Union
MARE project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101191436

MARE functional modules



PASTE: Pre-assessment Stress Testing
SEPE: Security&Privacy Engine

6GSNS EUROPEAN PARTNERSHIP
Co-funded by the European Union
MARE project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101191436

Thematic areas - 6G attacks surface

Thematic Areas	Proof of Concepts / types of attacks
TA1: Disaggregation with a “cloud-native” approach	• Network critical attacks • AI/ML-aided threat protection, detection, and response for the 6G core network • Full Plane Threat Detection – Internal attacks over network control critical elements
TA2: Intelligence at scale, AI adoption, data analytics	• Man-in-the-middle attacks - AI and models • Data and intent tampering detection • Trustworthy operation of AI • Secure Network Digital Twin
TA3: Heterogeneous resources, extensive edge usage	• DDoS attack from X-Edge
TA4: Network openness & exposure APIs	• Secure exposure of network capabilities
TA5: System convergence: Network of Networks	• Net of nets (attestations, support & share security in different network infra/tech)

6GSNS EUROPEAN PARTNERSHIP Co-funded by the European Union

MARE project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union’s Horizon Europe research and innovation programme under Grant Agreement No 101191436

Summary - expected outcomes

- Study, identify and categorize the threat landscape in the evolving 6G ecosystem
- Develop a set of enriched security functions – independent and modular blocks of software offering specific security functionalities
- Create a smart “pre-assessment” environment, including simulation, emulation and real infrastructure, where security related services and functions are analysed and tested
- The MARE solution will be aligned with the architectural concepts for 6G, as defined by European and international initiatives

6GSNS EUROPEAN PARTNERSHIP Co-funded by the European Union

MARE project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union’s Horizon Europe research and innovation programme under Grant Agreement No 101191436

Thank you

Follow us

#MARE6G_EU

@MARE_EUProject

@MARE_EUProject

@MARE_EUProject

@MARE_EUProject@eupolicy.social

6GSNS EUROPEAN PARTNERSHIP Co-funded by the European Union

MARE project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101191436