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EU H2020 Electrical Power System's Shield against complex incidents and extensive cyber and privacy attacks



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PHOENIX Objectives

- **Strengthen EPES cybersecurity preparedness** by employing a) “security by design” via novel protective concepts for resilience, self-healing and accountability, and b) “security by innovation” via adapting, upgrading, integrating and validating a number of TRL5 developments to TRL7-8.
- **Coordinate EPES cyber incident discovery, response and recovery**, contributing to the implementation of the NIS Directive by developing and validating at national and pan-European level, a novel fully decentralized near real-time synchronized information awareness exchange platform, among authorized utilities, CSIRTs, ISACs, CERTs, NRAs and the strategic NIS cooperation group
- **Accelerate research and innovation in EPES cybersecurity** by a novel prevent, detect and mitigate DevSecOps mechanism, secure and privacy preserving federated Machine Learning (ML) algorithms and definition of certification methodologies and procedures.

EPES Cluster Formation

PHOENIX is collaborating with the projects **SDN microSENSE**, **CyberSEAS**, **EnergyShield** and **ELECTRON**, all funded by the European Commission/REA to create a **Cybersecurity Innovation Cluster for EPES**. The kick-off meeting for the cluster was organized virtually June 4th, 2021.



Though independent, the cluster will be supervised by the EC and will act as a think tank and information exchange ecosystem to guide and coordinate the cybersecurity research and innovation results and synchronize the EPES Infrastructure Stakeholders' continuous effort on improving the cybersecurity and resiliency of their infrastructure

PHOENIX Tools for Secure EPES



Secure, Persistent Communications

Cloud-native communications layer supporting Security, Privacy and Survivability by design, ensuring data acquired/served are legitimate and secured, combined with a Universal Secure Gateway for securely interconnecting with existing EPES ICT systems, APIs and standards



EPES Situation Awareness, Perception and Comprehension

Classical and Federated Machine Learning for the identification of the security incidents and Co-Simulator that translates series of security incidents into valuated attack vectors



Privacy Protection Enforcement

Implementation of an advanced legal framework for suitably managing data, ensuring adequate levels of GDPR compliance, well beyond legacy Data Management Platforms



Incidents Mitigation and Enforcement of Countermeasures

Calculation and application of the minimum cut of a mitigation actions set that minimizes the residual risk of the identified attack and the mobilization of resources to mitigate the attack, based on game-theoretic approaches



Incidents' Information Sharing Platform

Pan-European platform for secure STIX-formatted CTI data exchange among EPES and to interested authorities, applying Machine Learning techniques to uncover coordinated attacks and attacks with cascading effects at pan-European level

Tribute to Project Officer

Tribute to Project Officer PHOENIX consortium would like to pay tribute to the project officer Nikolaos Panagiotarakis (Late). He passed away on 25th Jun 2021. We are thankful to him for his contributions as well as his passion and guidance to achieve our objective in PHOENIX. May his soul rest in eternal peace!