



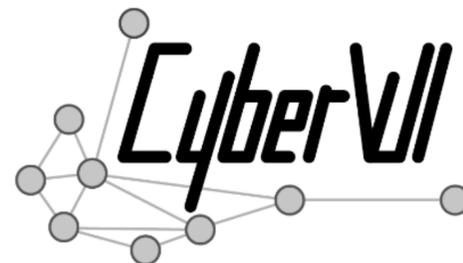
CELTIC-NEXT Proposers Day



23rd of February 2021, Online via WebEx

CyberWi

Cyber-security in the Wireless Industrial use cases



Harold Linke, HITEC Luxembourg S.A.
Harold.linke@hitec.lu

CyberWi Project Goals



- provide security solutions that integrate seamlessly over different infrastructures such as Cloud Computing, IoT networks and Embedded Systems.
- enable the Industrial Internet, allow small companies to easily deploy secure services operating across different infrastructures.



Project Data



Start date: 1.2.2016
Finish date: 31.12.2018
Budget: 5.17 Mio Euro
Effort (PY): 61.7



Partners



Luxembourg

HITEC Luxembourg S.A. (Coordinator)

Finland

Centria University of Applied Sciences
(Technical Coordinator)

Rugged Tooling

Finnish Meteorological Institute

Silverskin Information Security

City of Oulu

Elektro-Arola

Dynniq Finland (Imtech Traffic & Infra Oy)

VIRVE Products and Services

Sweden

RISE (SICS Swedish ICT
AB)

q2d Solutions AB

Ericsson AB

Elsys AB



Impact



Example for new and improved products, services and standards generated by CyberWi:

- SenseSec: reliable and secure IoT networks
- RoadWeather Station: secure access to IoT
- HaLi: Traffic Light pre-emption system
- Centria Cyber Security Laboratory
- OSCORE: new standard for secure IoT communication



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- SenseSec: reliable and secure IoT networks
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- **HaLi: Traffic Light pre-emption system**
- **Centria Cyber Security Laboratory**
- **OSCORE: new standard for secure IoT communication**



HaLi – Pre-emption system for emergency vehicles



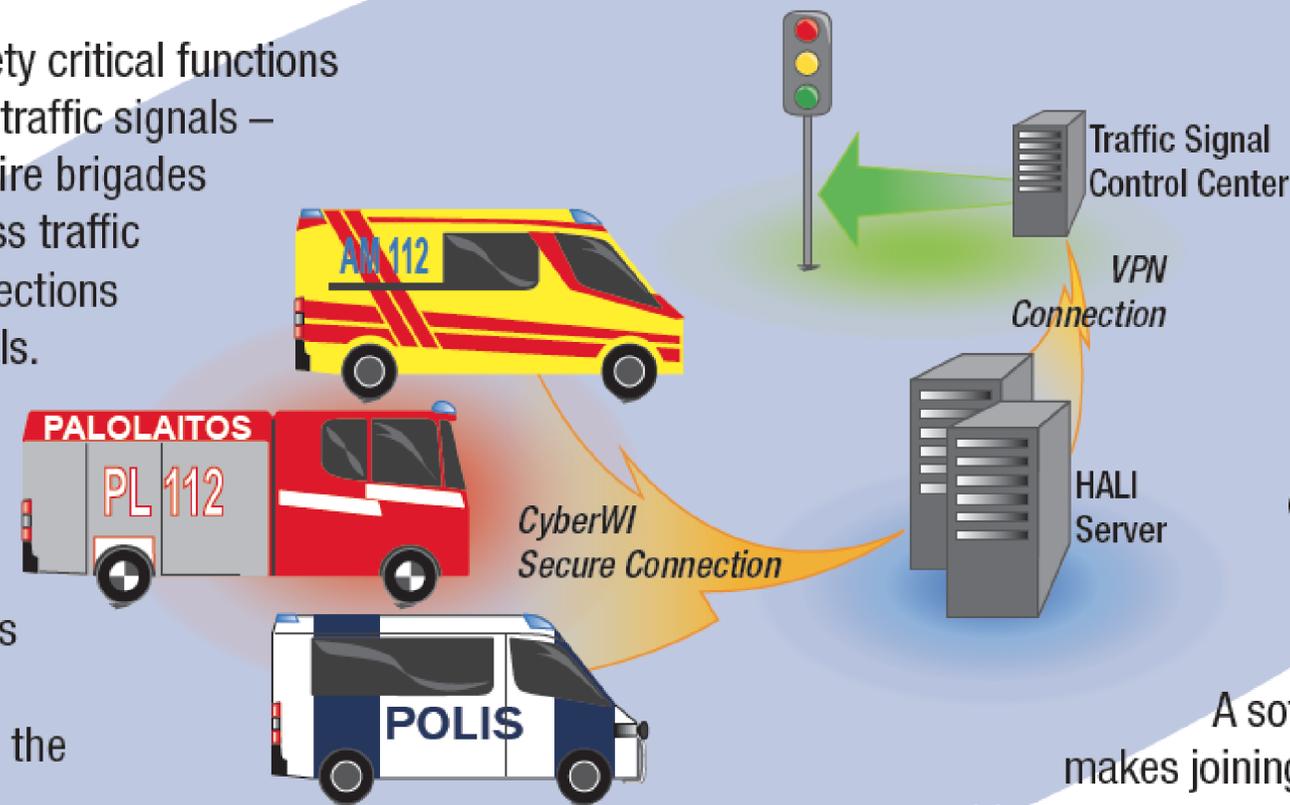
The huge financial and human cost was addressed in development of HALI with the benefit of faster response to emergency locations.

Award winning pre-emption system HALI is further developed as one of the use cases in CyberWi -project.

HALI connects two safety critical functions – emergency runs and traffic signals – allowing ambulances, fire brigades and police to safely pass traffic signal controlled intersections with green traffic signals.

Within the system the vehicles send their location and status of pre-emption need to automatically switch the traffic signals green.

The request for clear headway is made with connections installed within the vehicle.



HALI enables a clear headway for emergency vehicles by clearing the other vehicles out of intersection before the vehicle on an emergency run arrives to it.

A software based solution makes joining the system possible without expensive hardware investments.



HaLi – Pre-emption system for emergency vehicles



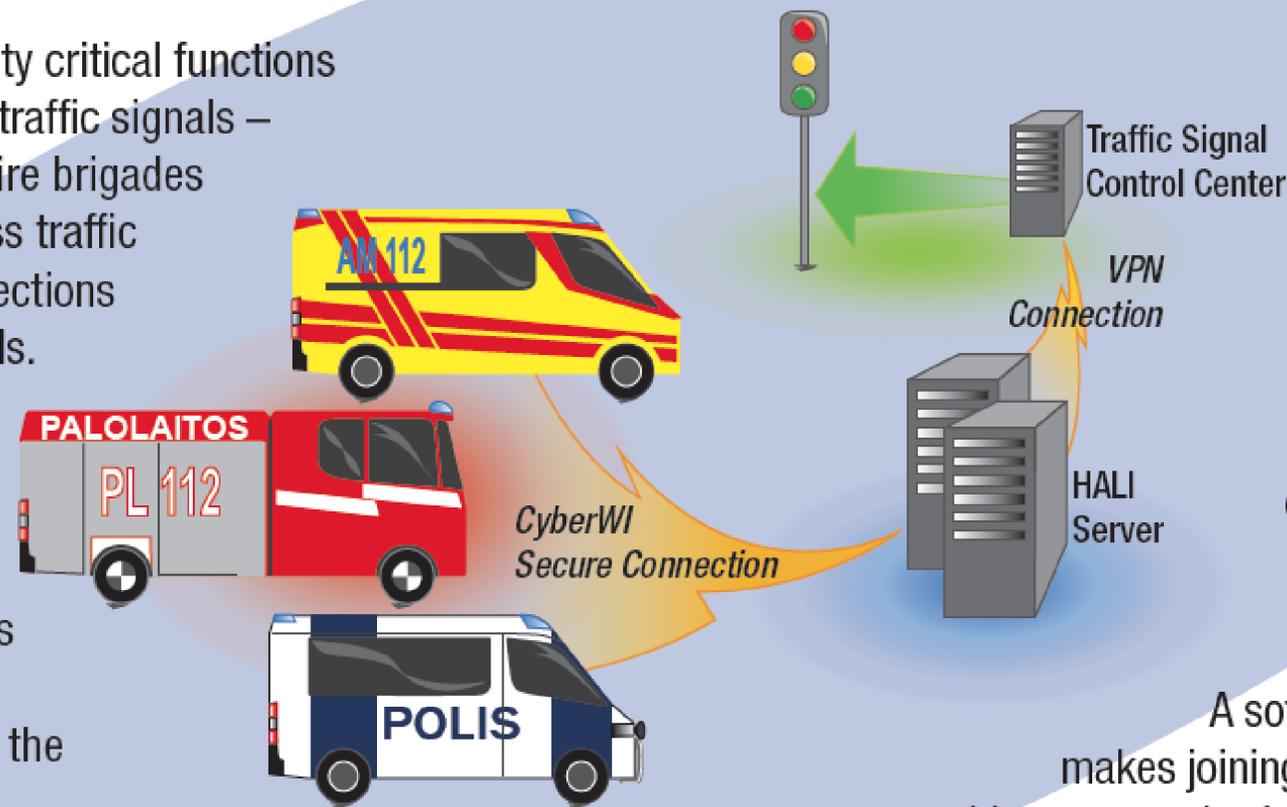
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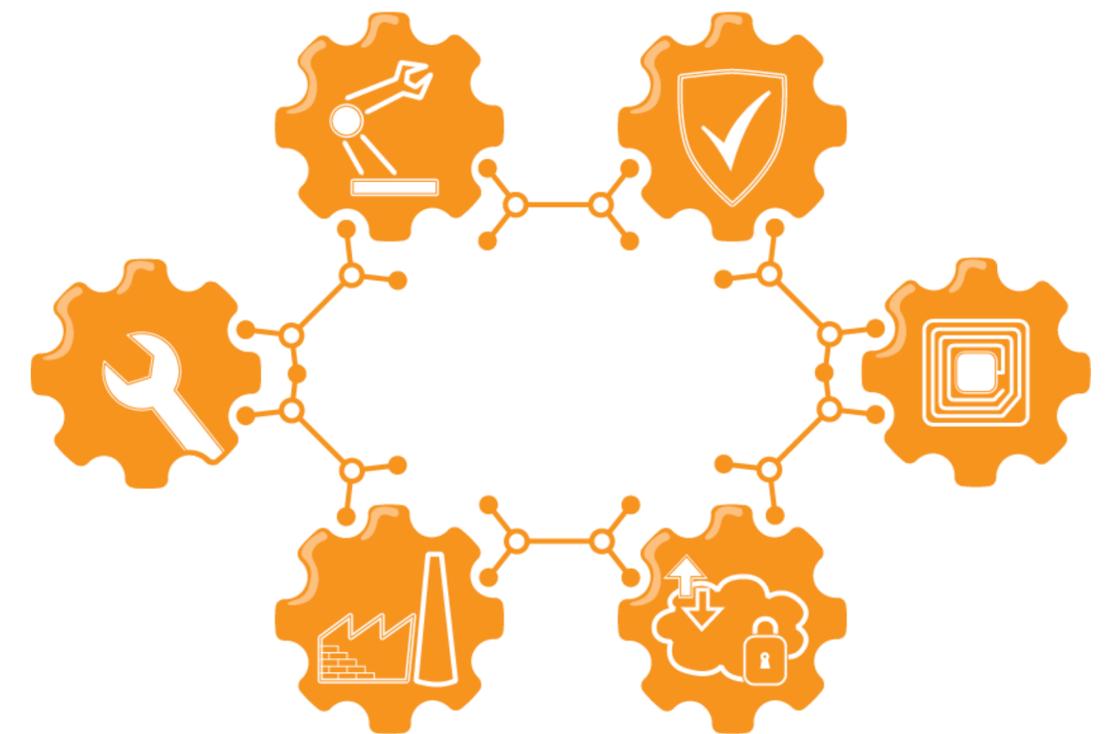
Status: over 700 users, over 500 vehicles, 600 traffic lights
55 municipalities

CyberWi, Harold Linke, HITEC Luxembourg S.A., Harold.linke@hitec.lu



CYBER SECURITY LABORATORY

Cyber security laboratory was developed in CyberWI-project



CYBER SECURITY LABORATORY

Services for companies of various size:

- Testing the network vulnerabilities
- Customized cyber security and GDPR training
- Assessment of company's cyber security



CYBER SECURITY LABORATORY

Services for companies of various size:

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Status: 22 commercial customers, 3 EU projects





IoT Features and Challenges

Existing Internet/ Web security tools were not always suitable for the Internet of Things, e.g.

- Security overhead challenges in constrained devices and radio
 - High latency and power consumption
- End-to-end security challenges with gateways and proxies.
 - Application layer proxy operations or change transport required terminating security

Need for new standardized enablers for lightweight end-to-end security in constrained environments.

OSCORE



The answer:

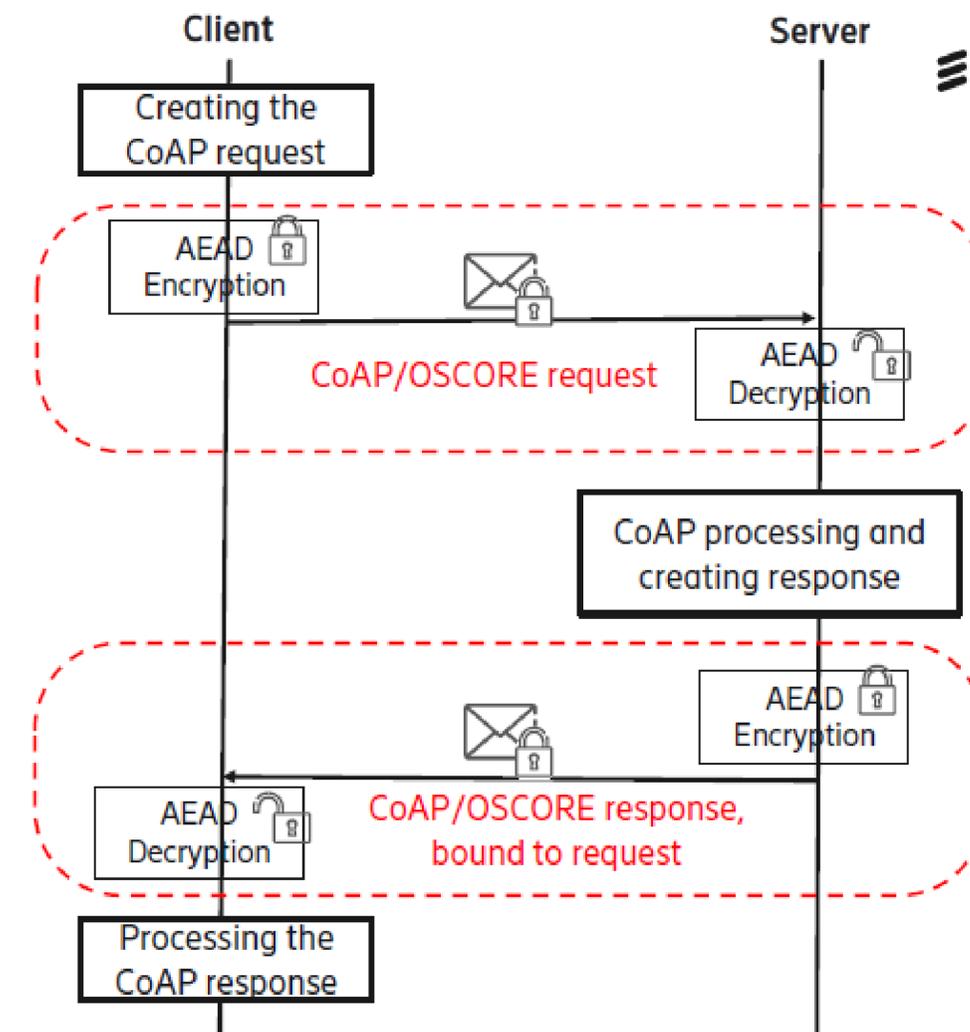
Object Security for Constrained RESTful Environments (OSCORE)

OSCORE Basics

- Extension to CoAP
- Protects CoAP messages using the COSE format (COSE_Encrypt0)
- Provides confidentiality, integrity and replay protection
- Binds response to request
- Handles partial loss of security context
- Uses Authenticated Encryption with Additional Data (AEAD)
- AES-128-CCM-8 is mandatory to implement

OSCORE is an Internet Standards Track document RFC 8613

<https://tools.ietf.org/html/rfc8613>



Other impact



- **Open source Software contributions:**

- HaLi (Traffic Light pre-emption system) is open source
- <https://github.com/eclipse/californium/tree/master/cf-oscore> (contribution of RFC8613 to the californium library),
- <https://bitbucket.org/marco-tiloca-sics/ace-java> (implementation of RFC8747 and other draft standards from the IETF ACE working group),
- https://github.com/Gunzter/contiki-ng/tree/oscore_dev (contribution of RFC8613 to the contiki-ng library)



Conclusion



The Celtic-Next project CyberWi generated a significant impact in

- Commercial results
- Cyber security improvements and education
- Public safety security
- Standardisation for IoT security



Contact Info



For more information and for interest to participate please contact:

Harold Linke, HITEC Luxembourg S.A.
Harold.linke@hitec.lu
+352 498678 749 Telephone
49, rue Du Baerendall
L-8212 Mamer
Luxembourg
www.hitec.lu



Presentation available via:

