

Cybersecurity highlights

5GTNF workshop
27 January 2021
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Roaming security (Ericsson)

- Ericsson has contributed to GSMA 5G Mobile Roaming Revisited Task Force
 - Target of the Task Force is scalable, usable and secure solution for 5G mobile roaming
 - 3GPP Rel15 and Rel16 specifications are in use but options should be cut out and a single solution to be recommended to all operators
 - Technical, business and security requirements identified
- Contributions also to 3GPP

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Home IoT protection (F-Secure)

- Built a model to capture "normal" IoT device communication
- **Permissive** enough to "accept" all possible **benign behavior**
 - No false positives / false alarms (as few as possible)
- Highly **restrictive** to "reject" any **malicious behavior**
 - High detection capability
- The model was built on the F-Secure SENSE data collected in a small experimental environment, based on (IP /MAC, protocol) pairs



Networking-based end point profiling

- F- Secure built a model to identify anomalous networking behavior in endpoints (input to the overall attack detection logic)
- **Current choice: one model per organization, a multi-class classifier, with the classes corresponding to the endpoints. When a model misclassifies new data coming from an endpoint, this is flagged as a potential security-related anomaly.**
- Classification object: "bag of words" for a specific endpoint – user pair, containing network_connection event data and new_process event data, compiled over a pre-defined period of time



Karma and Mind

- Improvements for the F-Secure's **object reputation system** to enable near-real-time object analysis and reliable provisioning of reputation information to large numbers of clients
- Access granted to Aalto for experiments

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Privacy-aware parental control in 5G (UH)

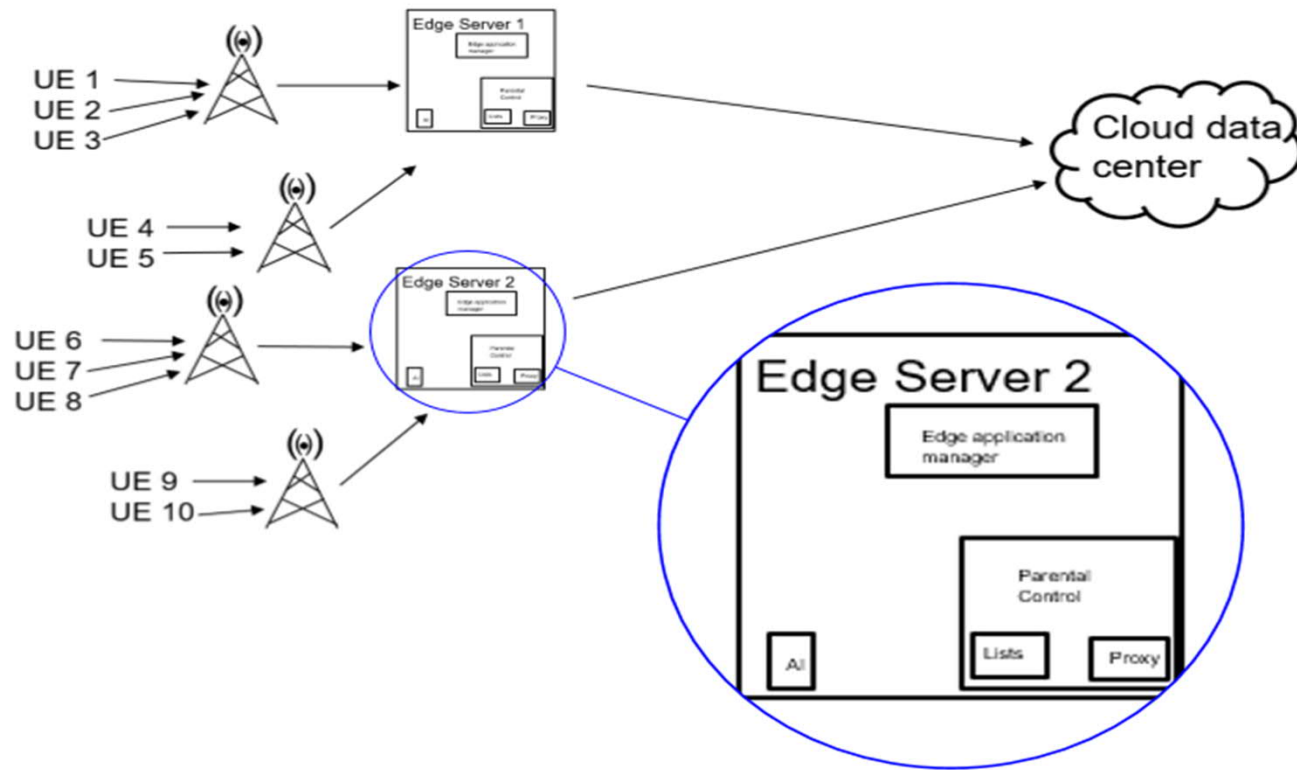


Fig. 1. Edge computing for parental control

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Privacy-aware parental control

- Parent's control **rules** kept **private** from the operator
- **Kid's** actions kept **private** from parent **if rules** are **not violated**
- Novel Private set operations protocols developed for usage between Kid (client), Parent (controls) and network operator (AI-based content analysis)



Telco honeypots (Nokia)

- GPRS Tunneling Protocol (GTP) traffic and feature analysis based on protocol specifications and real-life traffic
- Design and prototype implementation of a GTP-speaking telco honeypot
- Exploration of GTP nodes on open internet
- IoT honeypot operation on open internet and subsequent attack analysis



Identity and integrity mgmt (Nokia)

- Futurice subcontract to create a demo dashboard for showing **remote attestation** information, adapted to Nokia Espoo FX Lab
 - ETSI Security Week (June 2019) presentation and demo: "Demonstration of Remote Attestation in an NFV Environment".
 - Presented during Radio Active Days 2020 in Espoo
 - Presented to Veturi industrial partners Oct 2020
 - Also adapted to Nokia Murray Hill FX Lab
- Customer presentations of the remote attestation demo
- Several other talks/presentations/demonstrations

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SCION and cross-project collaboration

- Aalto/Comnet has set up the first SCION network on virtual machines in Finland and is testing the technology
- Co-operation in Mission Critical domain: PRIORITY (Centria)
 - End user needs and requirement definitions
 - Demonstrations for tactical bubbles
- Centria is building environment for studying AI, securing edges & IoT devices with low power constraints
- Centria supports Aalto for SCION study and demonstrations

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Thanks, Raimo Kantola continues ...

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