Forschungspraxis

Trusted Channels for IoT Devices (AISEC)

Remote Attestation is the process of assessing the trustworthiness of a remote computing platform through verifying the integrity of its software stack. Arm Trusted Firmware-M provides the Initial Attestation Service (IAS) to enable attestation on resource-constraint Arm Cortex-M microcontrollers. However, executing a remote attestation protocol without binding it to the device’s communication channel opens up the possibility of Man-in-the-Middle (MitM) attacks: In such a scenario, an attacker uses a rogue device to fetch attestation evidence from a good device and establish communication to an IoT hub or other IoT devices. Therefore, the scope of this work is to design and implement a channel binding mechanism for common IoT protocols such as Constraint Application Protocol (CoAP) to augment the communication channel with an attestation mechanism. This includes the following tasks:

• Survey of existing IoT protocols and attestation mechanisms
• Design of a channel binding mechanism, e.g., for CoAP with OSCORE/EDHOC
• Implement a Proof-of-Concept for the solution
• Evaluate the solution

Prerequisites

• High motivation and ability to work independently
• Good Programming skills in C
• At least basic knowledge of cryptographic primitives
• Preferably knowledge about embedded systems and Arm Cortex-M processors

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