Standards-based Remote Attestation for Internet-of-Things Swarms

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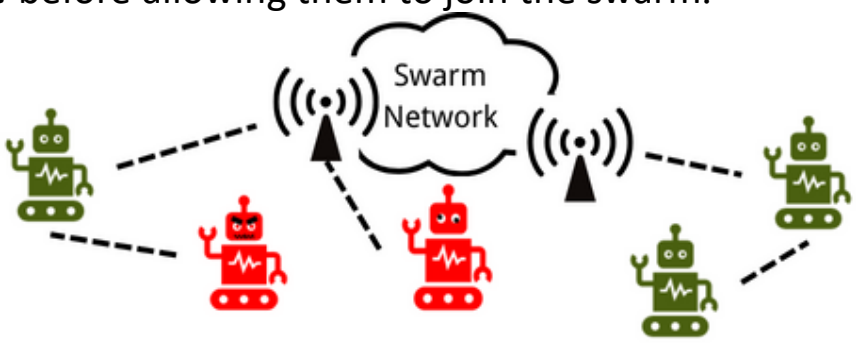
How to ensure that ***ONLY*** robots with ***verified and trustworthy*** software and hardware configurations are allowed to join the swarm ?

Assumption

Individuals in the swarm are attested through a ***central node*** before allowing them to join the swarm.

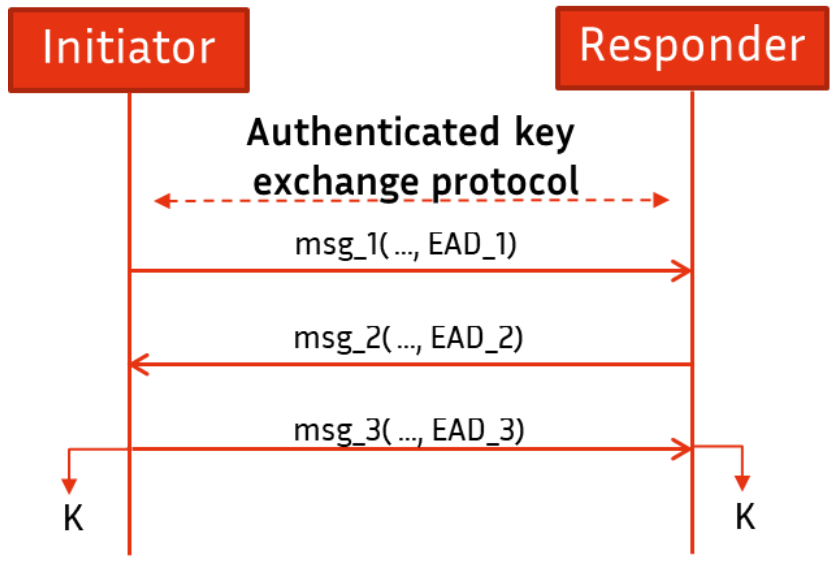


Background: Remote attsetation

Remote attestation [1] is a ***security process*** that can help the swarm central server establish a level of trust in the robot before allowing the robot to join the swarm.

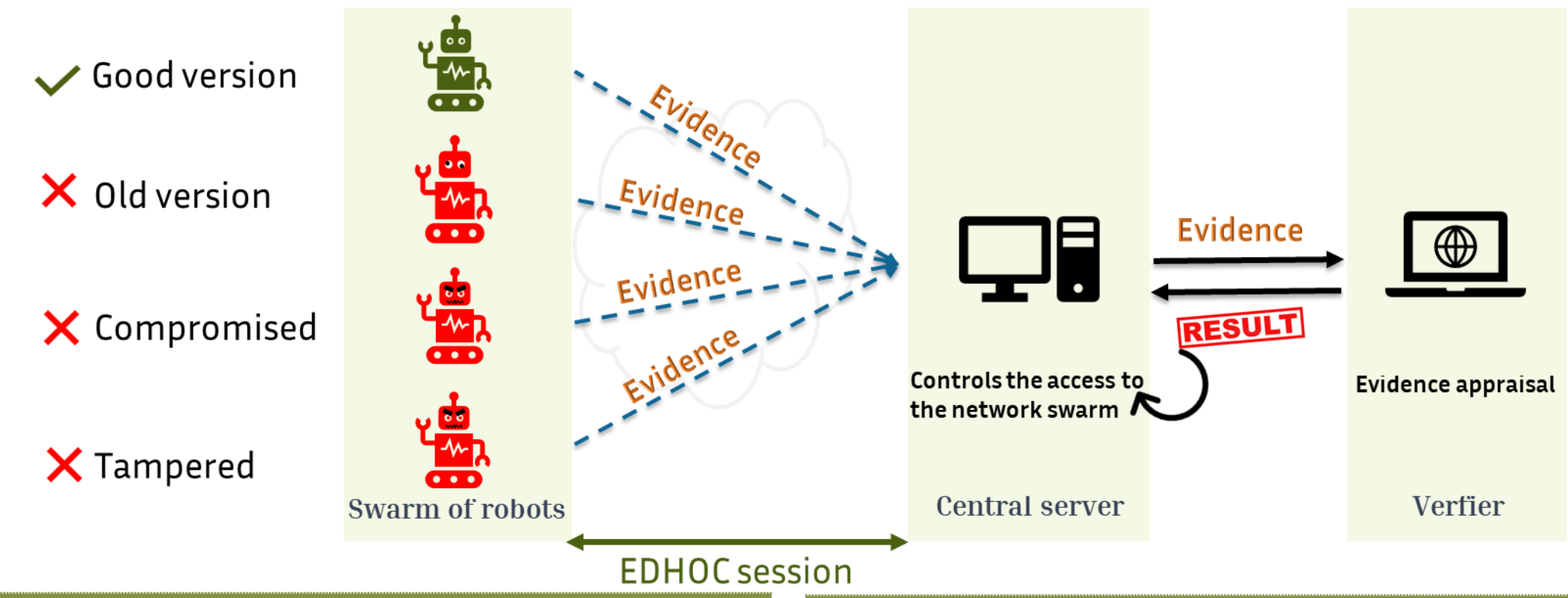
Background: EDHOC protocol

Ephemeral Diffie-Hellman over COSE (EDHOC) protocol [2] is a highly compact and efficient protocol that enables ***authenticated key exchange*** in ***constrained*** scenarios.



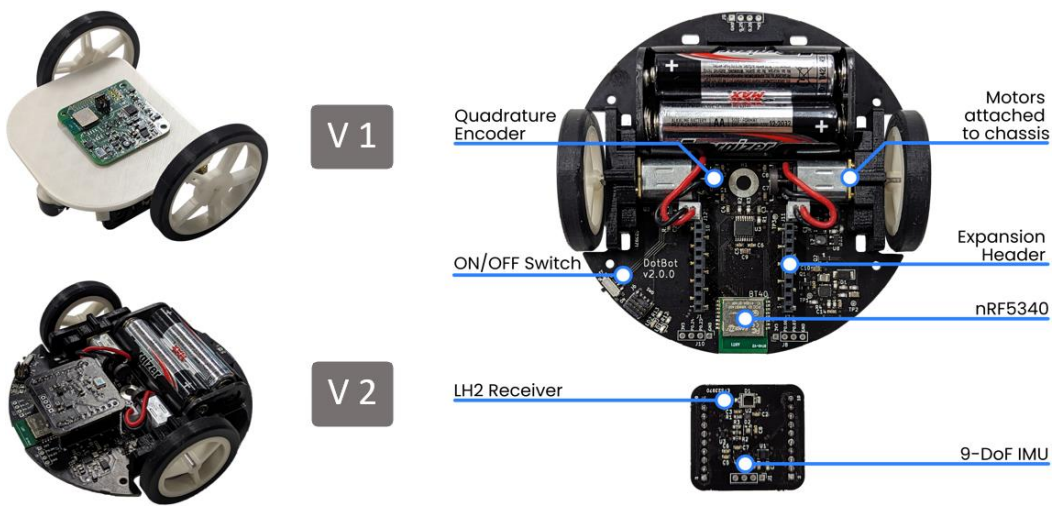
Attestation evidence is carried in EDHOC's External Authorization Data (EAD) fields.

Remote attestation over EDHOC for robot swarm



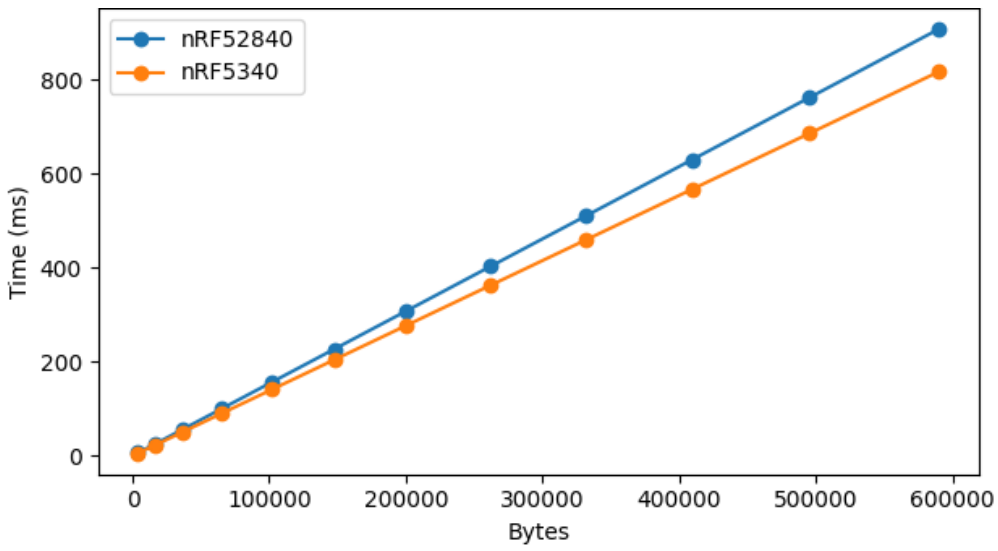
Evaluation

The micro-robots run on the nRF52840 microcontroller and the nRF5340 microcontroller.



Result

The feasibility of hashing the entire evidence on the constrained platforms.



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[1] H. Birkholz, D. Thaler, M. Richardson, N. Smith, and W. Pan, Remote ATtestation procedureS (RATS) Architecture, Internet Engineering Task Force (IETF) Std. RFC9334, 2023.
[2] G. Selander, J. Preuß Mattsson, and F. Palombini, Ephemeral DiffieHellman Over COSE (EDHOC), Internet Engineering Task Force (IETF) Std. RFC9528, 2024.

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