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Implementation of a Virtual Testbed for Secure IoT Firmware Update Using Blockchain

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Abstract : With the increasing need and popularity of IoT devices and how integrated they are becoming in our daily lives and industries, these devices make for a very lucrative target for malicious actors. And since these devices have such limited resources, the implementation of robust security features is a tradeoff to be made for the actual functionality the device was intended for. This makes them an easy target with high returns. Several frameworks for the secure firmware update of these devices have been recently proposed in the literature. They focus on methods such as blockchains and distributed file systems to secure firmware updates, but do not go into the details of the actual implementation of these frameworks and the lower-level interactions among these methods used. This work integrates some of these security measures into one overall framework and details the actual lower-level implementation of this framework in a virtual dockerized testbed running on AWS.

Keywords : blockchain, Ethereum, Geth, IPFS, secure IoT-firmware update, virtual testbed development
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