Security Architecture Development
in Internet of Things Operating Systems

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Abstract - **Due to the widespread use of the Internet of Things(IoT) in recent years, the need for IoT technologies to handle communications with the rest of the globe has grown dramatically. Wireless sensor networks (WSNs) play a vital rolein the operation of the IoT. The creation of Internet of Things operating systems (OS), which can handle the newly constructedIoT hardware, as well as new protocols and procedures for all communication levels, all of which are now in development, willpave the way for the future. When compared to other devices, these gadgets require a comparatively little amount of electricity, memory, and other resources. This has caused the scientific community to become more aware of the relevance ofIoT device operating systems as a result of their findings. Thesedevices may be made more versatile and powerful by includingan operating system that contains real-time capabilities, kernel,networking, and other features, among other things. IEEE 802.15.4 networks are linked together using IPv6, which has a wide address space and so enables more devices to connect to theinternet using the 6LoWPAN protocol. It is necessary to addresssome privacy and security issues that have arisen as a result of the widespread use of the Internet, notwithstanding the great benefits that have resulted. For the Internet of Things operatingsystems, this research has provided a network security architecture that ensures secure communication by utilizing the Cooja network simulator in combination with the Contiki operating system and demonstrate and explained how the nodescan protect from the network layer and physical layer attacks. Also, this research has depicted the energy consumption resultsof each designated node type during the authentication and communication process. Finally, proposed a few furtherimprovements for the architecture which will enhance the network layer protection.**

Keywords - 6LoWPAN, Contiki, IoT, WSN