Contribution ID: **222** Type: **Paper presentation**

Network Monitoring With Low Cost ESP32 Boards

Friday 19 September 2025 11:00 (15 minutes)

The proliferation of IoT (Internet of Things) devices in small offices and typical homes has created grounds for concern regarding network security. These devices are often using communication protocols that are commonly used by regular computers, to take advantage of the existing infrastructure. However, their "black-box" designs with no user interface and questionable providers, may become a cause for concern. The potential for these devices to be compromised, be it intentionally by the manufacturer or unintentionally by a third party, can lead to privacy violations and security breaches. Such issues take place in the form of, respectively, personal data collection and distribution, and malicious attacks on the network. Moreover, many users of such devices are not aware of the implications, and therefore take little to no preventive measures.
This project provides a solution for monitoring the network traffic of IoT devices and/or computers, using relatively low-cost hardware, and a custom software solution. The idea behind it is that there needs to be a balance between effectiveness, cost and ease of use. With this in mind, I have opted for using ESP32 boards, which are inexpensive, have a good set of features and large community support, and offer enough processing power to facilitate this task. As such, the data acquisition system effortlessly captures packets from the network and relays them to the compute unit, which then uses Suricata IDS to flag events.

Author: ZLATEA, Cezar (Universitatea Politehnica din Bucuresti)

Co-authors: VADUVA, Alexandru (UPB); RESUL, Ebru

Presenter: ZLATEA, Cezar (Universitatea Politehnica din Bucuresti)

Session Classification: Sensor Networking

Track Classification: Networking in Education and Research