**Meshed Network Research**



*A computer screen shot of a computer

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# Introduction:

This research will be based on getting acquainted with meshed networks. The ESP-MESH will be used to implement the PoC that we use as a learning point. A meshed network allows multiple devices (nodes) to communicate with each other under a single wireless local area network. We will make use of the ESP-MESH library to implement such a network with ESP32s.

# Protocol introduction:

This networking protocol is built atop of the existing Wi-Fi protocol. It allows multiple nodes to be interconnected with each other, using a single wireless local area network (WLAN). The protocol is self-healing a self-organizing which means that the network can be built and maintained autonomously.

The traditional Wi-Fi architecture looks something figure **1.**This figures shows that these nodes/stations are connected to a single, limited access point. Only 3 of them are able to establish a connection with the router and while the rest cannot for being outside of the range.

A diagram of a circuit board

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***Figure 1:*** *Traditional Wi-Fi architecture.*

An ESP-MESH architecture would looks something like figure **2.** Within the network, the nodes do not need to connect to the central access point but they are responsible for delivering connections to other nodes as well. This allows for multiple nodes to interconnect so that it spread over a large physical area.

A diagram of a diagram of a station

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***Figure 2****: ESP-MESH network architecture.*

# Basic PoC implementation:

A basic example can now be built now that the concept is known. The “painless Mesh” library will be used to implement this PoC.

**Note: On code compilation, you may notice a lot of problems/warnings pop up. This is due to the library itself being somewhat outdated.**

# Bibliography: