

# ELEC-C7420 - Basic principles in networking

## Assignment III - Authentication

### End Point Authentication

Endpoint authentication is a security mechanism designed to ensure that only authorized devices can connect to a given network, site or service. The approach is also known as device authentication. In this context, the endpoint most often considered is a mobile computing device, like a laptop, smart phone or tablet but it could be any connected hardware device on a TCP/IP network. The possibilities include desktop computers, printers, servers and specialized hardware such as POS terminals, smart meters and other smart devices. Endpoint Security Management is becoming increasingly important in the expanding areas of machine-to-machine (M2M) communications and Internet of Things (IoT) Endpoint fingerprint is one method of enabling authentication on non-traditional network endpoints such as smartcard readers, HVAC systems, medical equipment and IP-enabled door locks.

In human communications, endpoint authentication is often used in conjunction with user authentication for greater security. Authenticating both the user and the device can provide two-factor authentication (2FA). For a smartphone, there are apps that provide one time password tokens, allowing the phone itself to serve as the physical device to satisfy the possession factor. The password response sent from the registered device verifies that the user is connecting from an authorized endpoint.

### Sketch

This sketch scans for 802.11b/g network with one of the boards that support this library. Your Arduino Software (IDE) serial monitor will print out information about the board and the networks it can see, with the encryption type. It will connect to a network via authentication.

### Steps

- Create a sketch that prints the board's MAC address.
- It scans for the available encrypted WiFi networks every 10 seconds and prints the WiFi channel and BSSID on the serial monitor.
- After 3 cycles (10 seconds/cycle) if connects to the provided SSID.
- It connects to the network via authentication (Password)

You can use your cellphone personal hotspot to carry out the authentication.

### Questions

- Which authentication methods did you find?
- Please describe three authentication methods in 802.11
- Describe briefly applications scenarios for this methods.

### Guidelines

- \*\*\*The exercise will be shown as a demo in the exercise session (No report Required).
- Total of 8 points maximum will be allocated for this exercise as follows:



- Successfully print MAC address 0.5 pts.
- Successfully scan and show wifi channel and BSSID 2 pts.
- Successfully implement reading the network to connect 1pt.
- Successfully connects the protected network 0.5 pts.
- Successfully find authentication methods 1 pt.
- Good description of the methods 2 pts.
- Good description of application scenarios 1 pt.