30 April 2017

# Angstrom CTF
## Knock Knock

### Crypto - 30 points

Last week a friend of mine asked me if I wanted to join a Capture The Flag event and try to get some points in for the team. This event, the ångstromCTF, ran from the 22th of april till the 29th of april and was setup by students at Montgomery Blair High School. Although I didn't have much time at the time of the event I was still able to solve 2 challenges. One of which is this crypto challenge, Knock Knock.
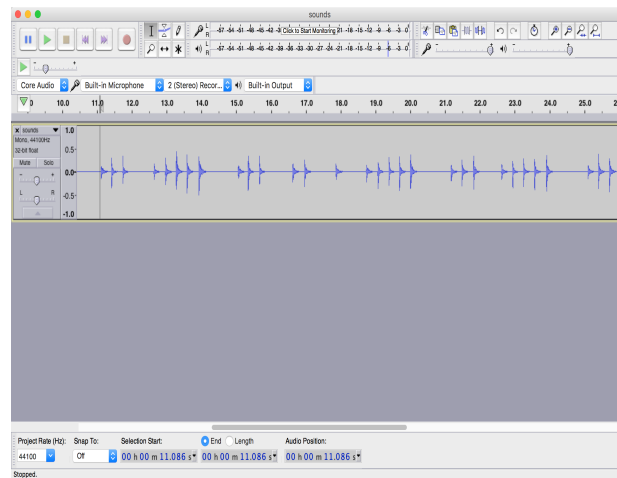
### Challenge

You have come across a strange audio recording. Can you recover the flag? Note: The flag is not in the actf{} format. Hint: Google is your friend.

### Solution

The provided audio recording is 38 seconds in length and when listening to it, what didn't come as a surprise, one can only hear the sounds of someone knocking on a hard object. Thinking of previous audio challenges I first tried analyzing the audio file with a spectrum analyzer to no avail, no clear pattern could be recognized. But as I repeatedly listened to the track, there was clearly a pattern in the audio. Pauses can be heard in between the knocking which immediately reminded me of some kind of

morse code. Investigating the audio file in audacity and slowing down the track gives us a nice look at the individual knocks and the pauses in between.



Not much later I realized that this was not morse code at all and listened, as you always should, to the hint that was given in the challenge description. A quick search with keywords like "knock code" turned up a Wikipedia page: **Tap Code**.

Reading up on this encoding scheme I started applying the instructions and reference table to the audio file. Translating the knocks to numbers the result can be seen in the table below.

| Row | Column | Corresponding letter |
|-----|--------|----------------------|
| 2 | 3 | H |
| 1 | 5 | E |
| 3 | 1 | L |
| 3 | 5 | P |
| 3 | 2 | M |
| 1 | 5 | E |
| 3 | 5 | P |
| 3 | 1 | L |
| 1 | 5 | E |
| 1 | 1 | A |

|   |   |   |
|---|---|---|
| 4 | 3 | S |
| 1 | 5 | E |

Turning in the flag: actf{HELPMEPLEASE} awards 30 points.