

“knock, knock!”

the door which the postman stood before was grand in design: the brownish color indicated it was perhaps made from mahogany, and there were golden accents decorating the surface all over. its looming area caused a nervous bout to spew up within the postman, and he gripped the handle of his bag ever so slightly more tightly. *wow, he thought to himself, why, this must be the home of someone rich! is there a library within these premises? something confidential?*

he noticed the door was locked, though there was a keypad before him, so if he happened to guess the correct password, he supposed he would have access to whatever was inside.

“who is it?” the voice was muffled behind the door.

“i dare not think my name is way too important, sir, so i implore you to just call me 192.168.64.2¹, your next door neighbor, most humble postman.”

he dipped his head into a bow despite having no audience to bow before.

“um, sir!”

“what?”

“may i confirm that this residence is, uh—” the postman glanced down at the envelope which he had rummaged through his bag, “45.79.89.123², or cs338.jeffondich.com?”

“yes, that’s correct. do you have a delivery for me, by any chance?”

upon hearing this question, the postman was stricken by the most mysterious sensation that he couldn’t possibly describe in words. it was a sudden desire that hit him like a ton of bricks, overtaking him and whispering in his ear to go in and explore whatever was behind these brilliant doors before him.

on the spot, he came up with a plan.

whether it was a well-thought plan was a question to leave for another day.

“well, yes and no,” the postman replied after a small pause, “i do have an envelope for you, sir, but it is basically a request for me to access something from your humble abode.”

“and what is that something?” the voice asked, suspicious. “do you have anything specific you are looking for?”

¹ the ip address of the server

² ip address of client

"i forget, but i would like to look through your office or library, if you have one anyway. even if i don't remember the name, i'm sure i will be able to run into what i'm looking for eventually."

"...how do you know it's a request?"

"because the back of the envelope says 'GET /basicauth/ HTTP/1.1³', sir."

the postman could hear shuffling from within the premises: it appeared this was what was needed to catch the owner of the residence's attention. it sounded akin to the sound one would make when clumsily falling out of bed.

silence then followed, but then came the response: a very firm "no".

"but why, sir? here on the envelope is the request. you can come out and confirm for yourself."

"no means no."

"what could you be hiding? something too embarrassing to show?"

"none of your business."

"but—"

"now you listen carefully," the voice seethed from the other side of the door, "let me spell it out for you loud and clear. 'HTTP/1.1 401 Unauthorized'⁴. need i explain more?"

"w-what does unauthorized mean, sir?"

"it means you don't have permission to access this library of mine. should you prove that you indeed *do* have access, then i suppose i could allow you in, but you need to guess a password, for this is a protected area⁵."

"is that a challenge, sir?"

"if it seems like a challenge, then a challenge it must be."

though the postman felt it was wrong to do such a thing when the recipient of the envelope wasn't even himself, curiosity won him over.

³ the request sent to the browser to access the /basicauth/ directory from the server → client, written in http protocol

⁴ query sent in response to the request from the previous footnote; server sends 401 unauthorized message when user tries to request protected source without credentials

⁵ www-authenticate header that comes with the server response 401 unauthorized message, indicating that credentials are needed

if the envelope was a request to access whatever was within, then the contents of the envelope should contain the necessary information, right?

the postman opened the envelope, looking through the letter.

“uh, excuse me if i’m wrong, but is the username ‘cs338’ in all lowercase letters and the password is... uh, just ‘password’⁶?”

“wh—you idiot! that’s not something you should just say out loud! i mean, yes, that is the case, but give me that information but in base 64⁷!”

“ah ah, ok ok! calm down, sir! let me think!”

the postman pulled out his phone and typed in the words *basic authentication header generator* into the search bar of goggle, then inputted *cs338:password* into the box before clicking “[base64 encode](#)”.

“ok, sir,” he said, “i’m going to say the base64 version, so listen carefully, okay?”

“...go on.”

he sounded reluctant, but still prompted the postman to continue.

“Y3MzMzg6cGFzc3dvcmQ=. this is it, right? will you allow me in?”

“what are the magic words?”

“GET /basicauth/ HTTP/1.1, sir⁸.”

silence ensued before a muffled reply came from the other side of the door.

“HTTP/1.1 200 OK, come in.”

the postman cheered to himself before making his way through the door. he opened it, and within it was nobody, and nothing but a bookshelf.

on that bookshelf, there were no books – instead, there were just three sheets of papers. along the edge of the shelves were labels written on a piece of paper. the labels read ‘amateurs’, ‘armed-guards’, and ‘dancing’.

⁶ the browser is requesting credentials from the user as a challenge

⁷ in wireshark, the authorization header contains the credentials, which are formatted as “[usr]:[pwd]”. this text is then encoded into base64... the text is “Authorization: Basic Y3MzMzg6cGFzc3dvcmQ=”, where everything after ‘Basic’ is the base64 notation of “cs338:password”. the browser checks these credentials.

⁸ when requesting access again, this time it contains the correct credentials, which leads to the response HTTP/1.1 200 OK, which indicates successful request and user can access page

Other things

- connection is [keep-alive](#); this is known as a persistent connection and is a communication pattern to reduce amount of http requests
- what is content- and transfer-encode? or gzip (i assume it's a type of compressing method for the packets?)
- am sick please send help