

# FTPChat Project

File Transfer Protocol Chat Project

# Purpose

To build a secure messaging system without using WebSockets.

FTPChat uses FTP as a relay layer and applies multi-layer encryption to protect messages.

This project's goal is to prove that legacy protocols can be repurposed for modern secure communication and decrease the reliance on WebSockets and repurpose old devices for another uses such as hosting FTP servers which reduces E-waste.

# Background Research

- WebWebSockets often introduce instability and security risks.
- FTP is a legacy protocol designed for file transfer, but it can be repurposed as a message relay.
- Routers like ZTE ZXHN H188A and platforms like SFTPCloud.io support FTP hosting.
- Python provides libraries for encryption and file handling

# Hypothesis

It's possible to build a stable, encrypted messaging protocol that works on legacy hardware and modern networks, without tunneling tools or WebSockets dependencies.

Making developing chat apps easier for software developers to develop

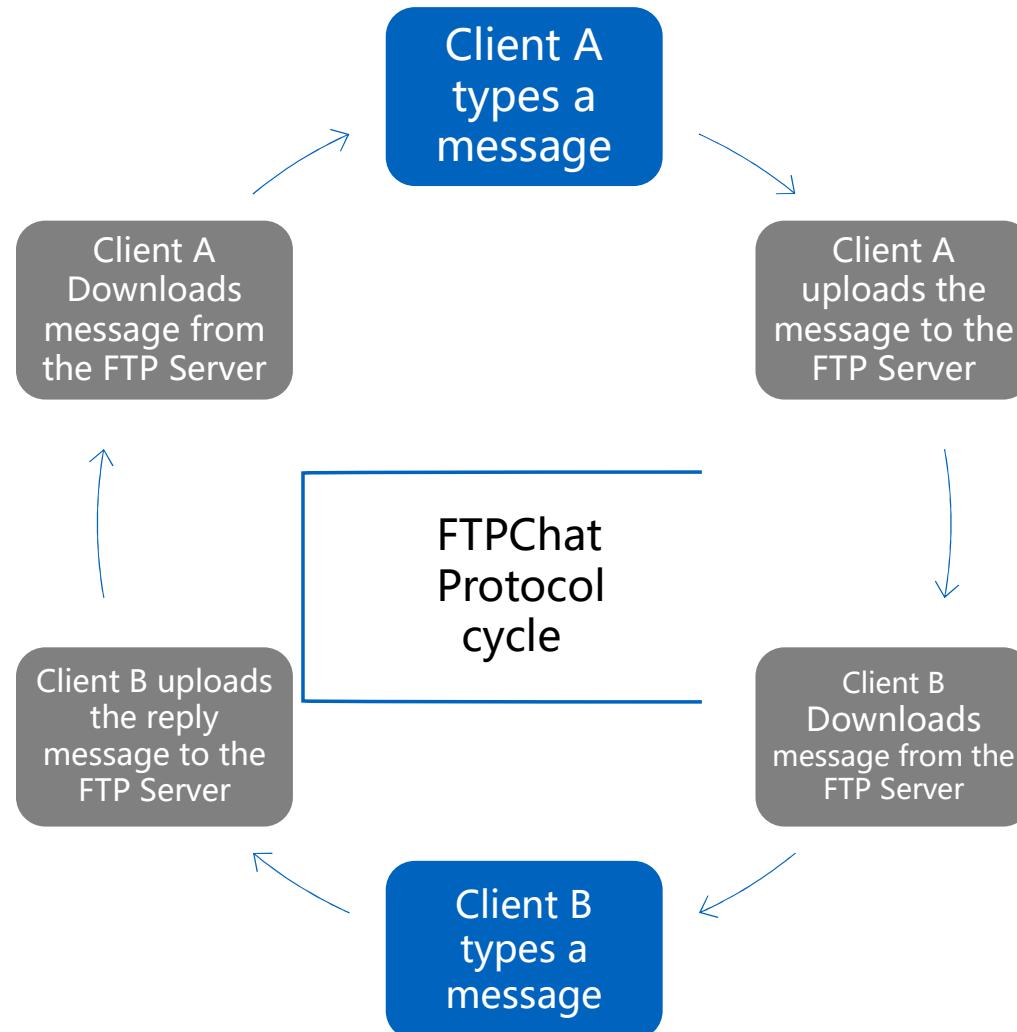
# Materials Used

- Router with FTP support (ZTE ZXHN H188A)
- SFTPCloud.io website
- Python 3.x
- Inno Setup
- Code editor (VS Code)
- Internet connection for global testing
- 32GB pen drive
- Total Price: 1900 EGP

# Procedure

- Define the problem: eliminate WebSockets dependency.
- Learn Python and FTP file handling.
- Write relay logic using FTP upload/download.
- Implement 24-layer mono-alphabetic encryption.
- Host protocol on router and SFTPCloud.io.
- Test message delivery and encryption integrity.

# Visualizing how it works



Note: The FTP server acts as a relay node, secure, WebSockets-free, and encrypted.

# Data Analysis

- FTPChat successfully relayed encrypted messages without using WebSockets.
- Relay speed remained consistent across both local routers and cloud-hosted FTP servers.
- The 24-layer encryption added security without increasing file size or causing latency.
- Routers like the ZTE ZXHN H188A can hold 50-100 users (According to the calculations).
- AI-based inspection tools were unable to decrypt the messages, confirming encryption strength.
- FTPChat is eco-friendly, since it runs on low-power devices such as routers.

# Applications

- Secure chat in schools and labs

Easy setup for private messaging without WebSockets.

- Works on old devices

Runs on routers, old PCs, and low-power systems.

- Company communication

Safe internal messaging between employees using FTP.

- Global and local use

Works with cloud servers or home routers, no special tools needed.

# Abstract

FTPChat is a Python-based messaging protocol that replaces WebSockets with FTP-based encrypted message relays. It uses FTP servers as secure hubs, enabling asynchronous communication even in firewall-enabled PCs or legacy networks. Messages are encrypted with a 24-layer cipher and exchanged via upload/download cycles. Ideal for environments where WebSockets are blocked or unreliable.

# Results

- Messages sent and received successfully
- Encryption verified across all tests
- Protocol hosted on ZTE router and SFTPCloud.io
- No tunneling tools or WebSockets libraries used
- Stable performance across devices

# Conclusion

FTP can be used as a secure relay for encrypted messaging. FTPChat proves that legacy protocols can be repurposed for modern secure communication. The system is WebSockets-free, stable, and deployable across various platforms.