

File Transfer Protocol

Introduction:

File Transfer Protocol (FTP) is a standard network protocol used for the transfer of files between a client and a server on a computer network. It operates on the application layer of the TCP/IP protocol suite. FTP provides a simple and reliable method for transferring files over the internet.

Aim and Objective:

The primary aim of FTP is to facilitate the efficient, secure, and reliable transfer of files between a client and a server. Its objectives include:

- Enabling users to upload files from their local system to a remote server.
- Allowing users to download files from a remote server to their local system.
- Providing authentication mechanisms to ensure secure access to files.
- Supporting various transfer modes such as ASCII and binary to accommodate different types of files.
- Offering features like directory listing, file renaming, and permission management.

Theory of Operation:

FTP operates using a client-server model, where the client initiates a connection to the server to perform file transfer operations. The key components of FTP operation include:

- Control Connection
Establishes communication between the client and the server for sending commands and receiving responses.
- Data Connection
Used to transfer actual file data between the client and the server.
- Commands
Client sends commands such as login, list directory, upload, download, etc., to the server over the control connection.
- Responses
Server responds to client commands with status codes indicating success, failure, or other relevant information.

Steps Involved:

The typical steps involved in an FTP session are as follows:

Establish Connection: The client initiates a TCP connection to the FTP server on port 21 (the default control connection port).

Authentication: The client authenticates itself by providing a username and password.

Navigate Directories: The client can navigate directories on the server using commands like CD (change directory) and PWD (print working directory).

Transfer Files: The client can upload files to the server using the PUT command or download files from the server using the GET command.

Close Connection: Once the file transfer is complete, the client can close the connection using the QUIT command.

Conclusion:

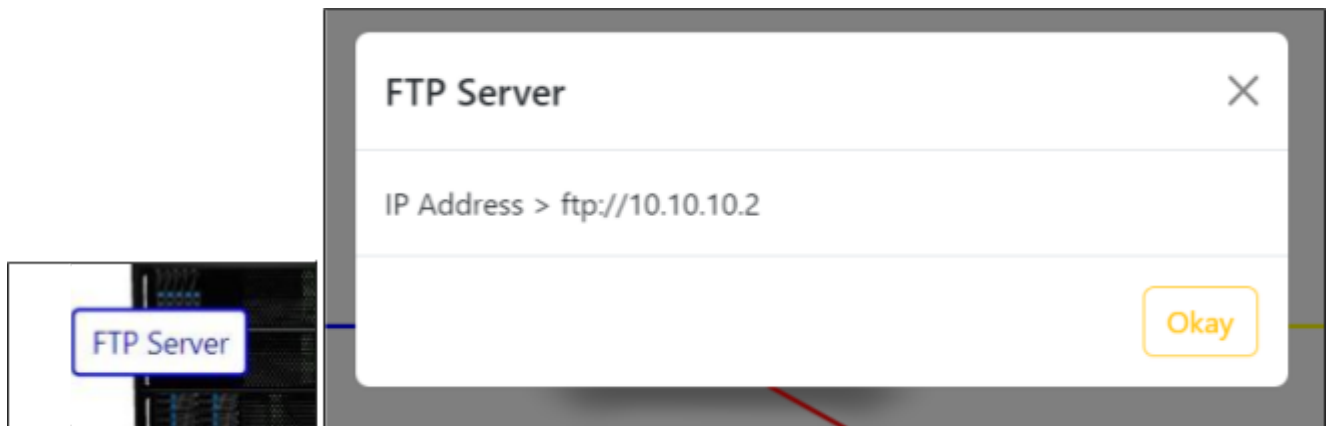
File Transfer Protocol (FTP) is a fundamental protocol for transferring files over a network. It provides a robust mechanism for users to exchange data between local and remote systems securely.

Understanding the theory of operation and following the steps involved enables efficient utilization of FTP for file transfer purposes.

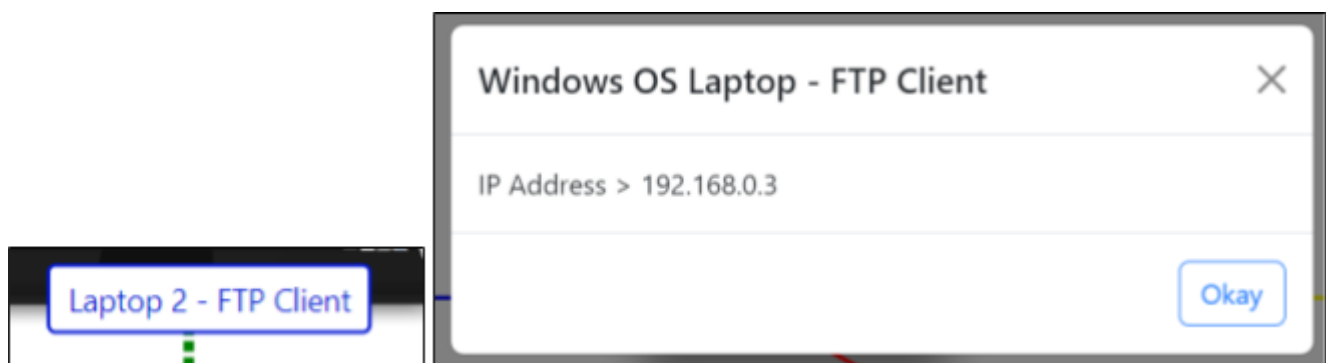
Let's Start Transferring File using FTP (File Transfer Protocol) in AR World!!

1. To obtain the IP addresses of network devices, please click on their respective names. Know IP Address

1.1



1.2



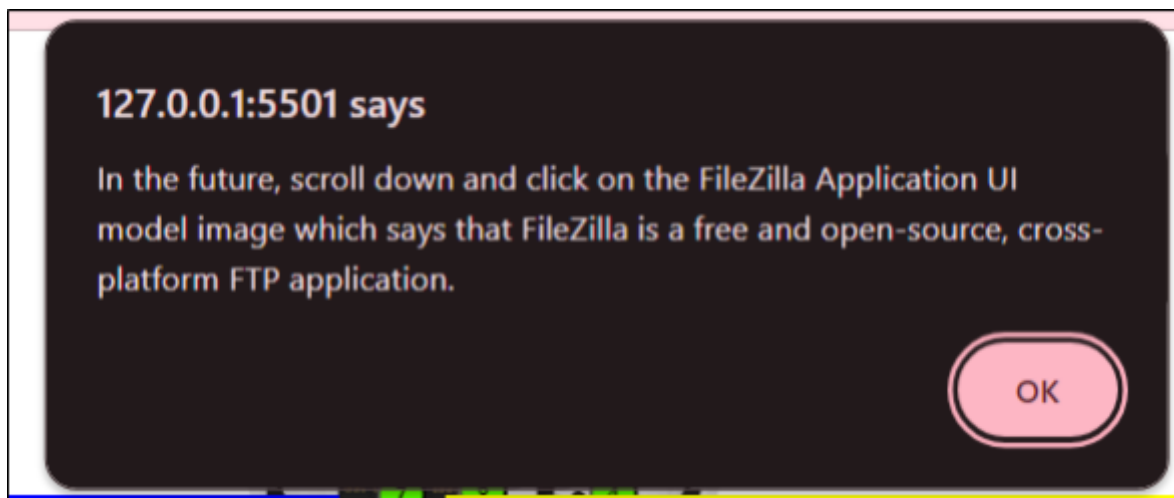
1.3



2. Click on FileZilla FTP Application Logo

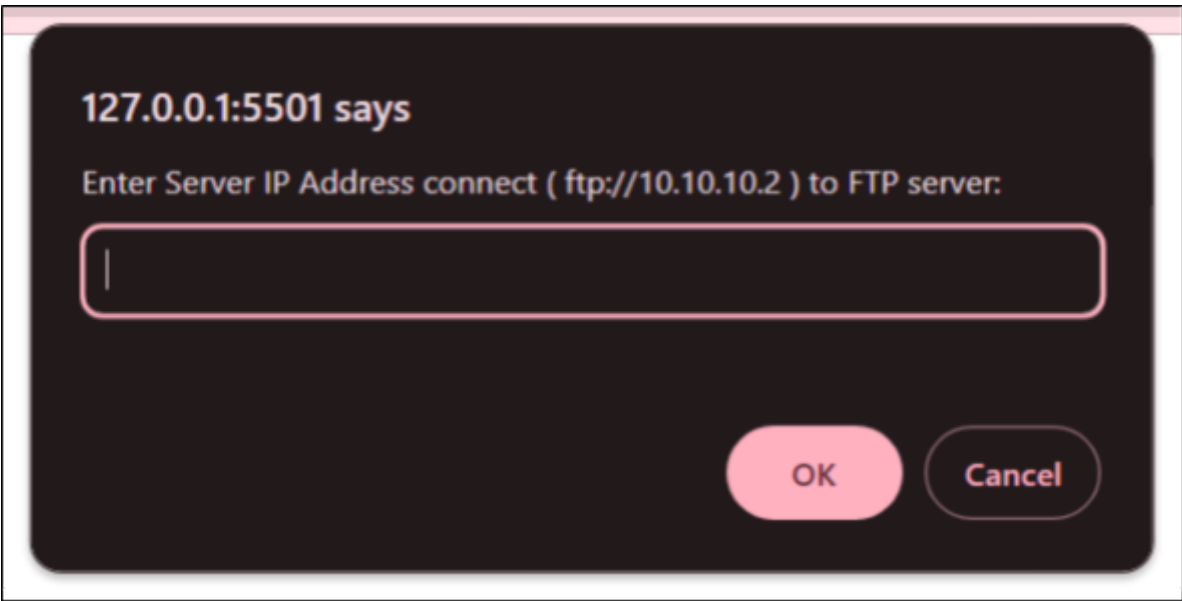
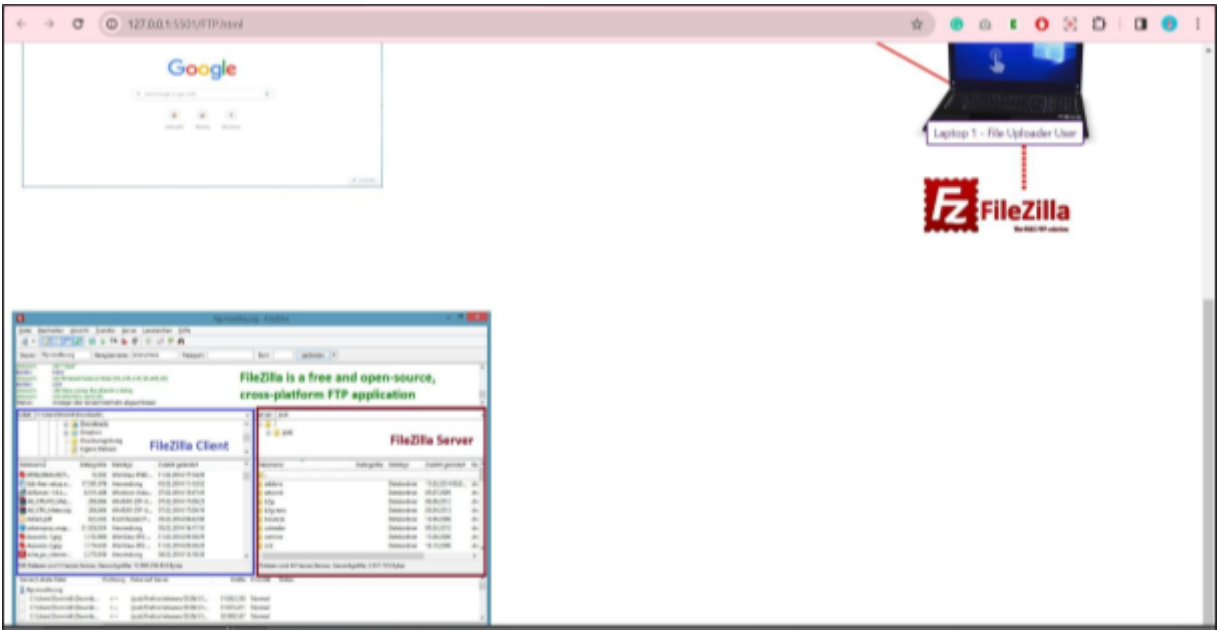


2.1 It will display something like this



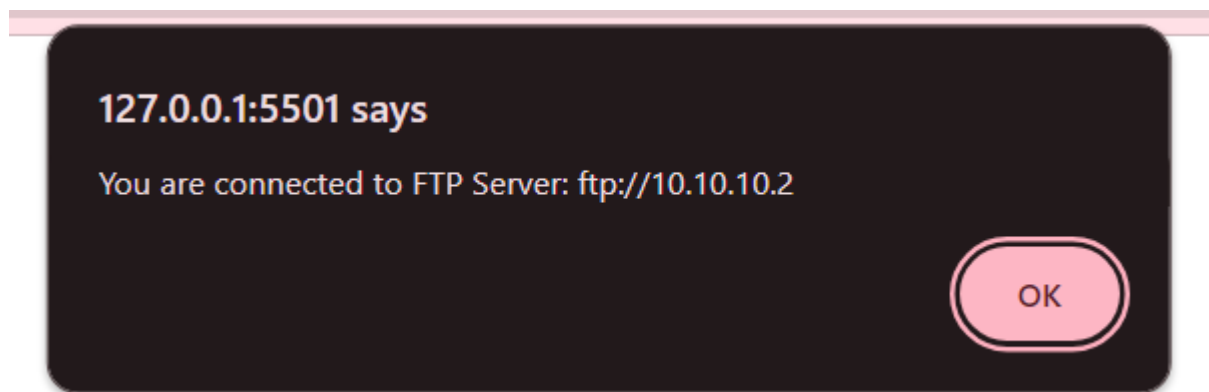
After Reading it Click “Ok”.

Now Scroll Down you will see image like this



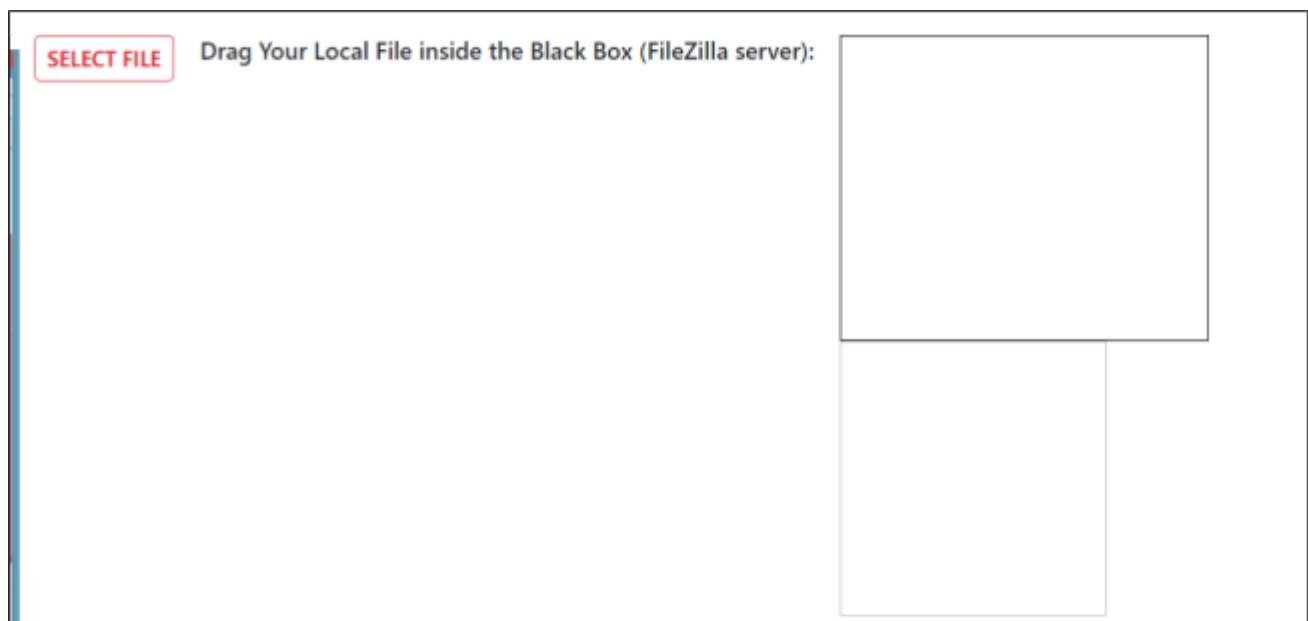
2.2 Enter there out FTP Server IP Address which we saw on first step **ftp://10.10.10.2**

2.3 Then it will prompt after entering correct IP Address



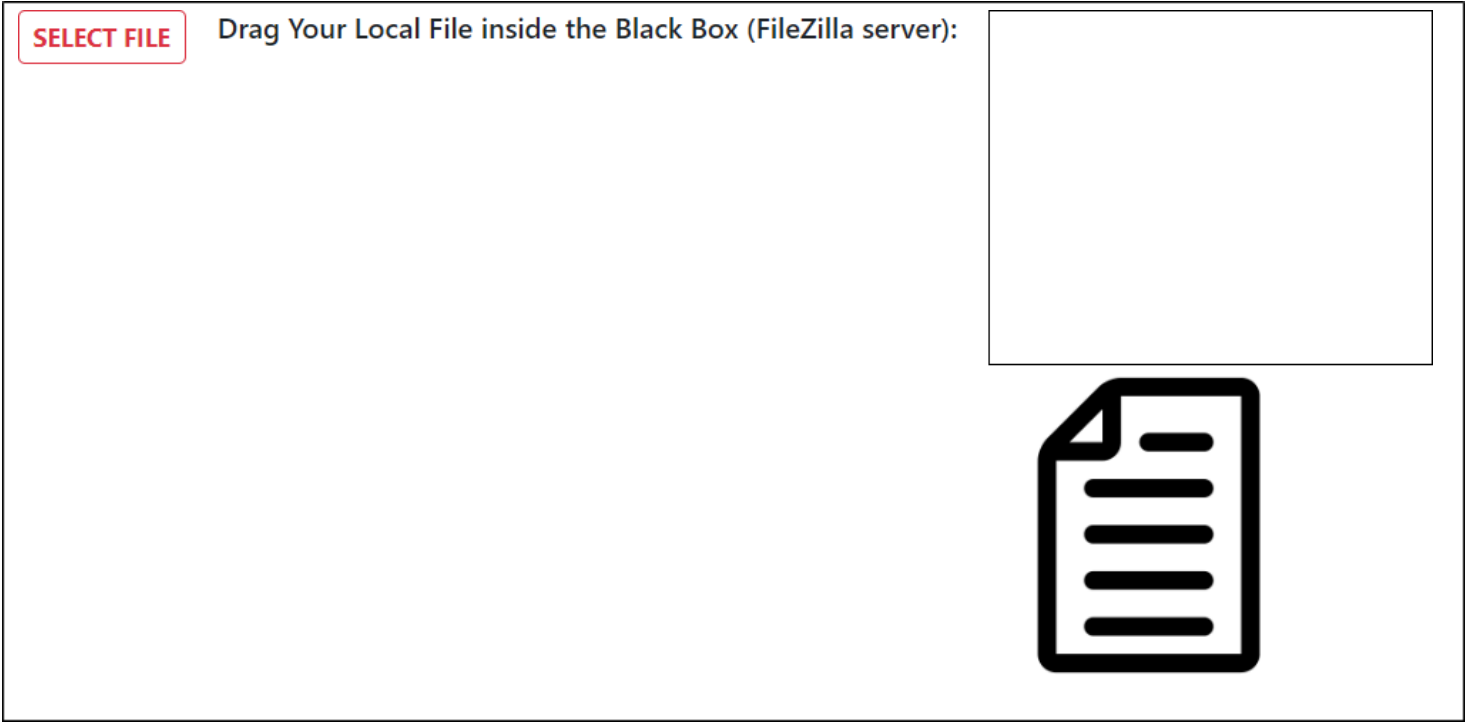
Click "Ok"

Now you will get a few things to upload your local file to the FTP Server. It shows FileZilla Application is used to upload files from your local file that represent FileZilla Client where you see your local files and then you can drag those to FileZilla Server.



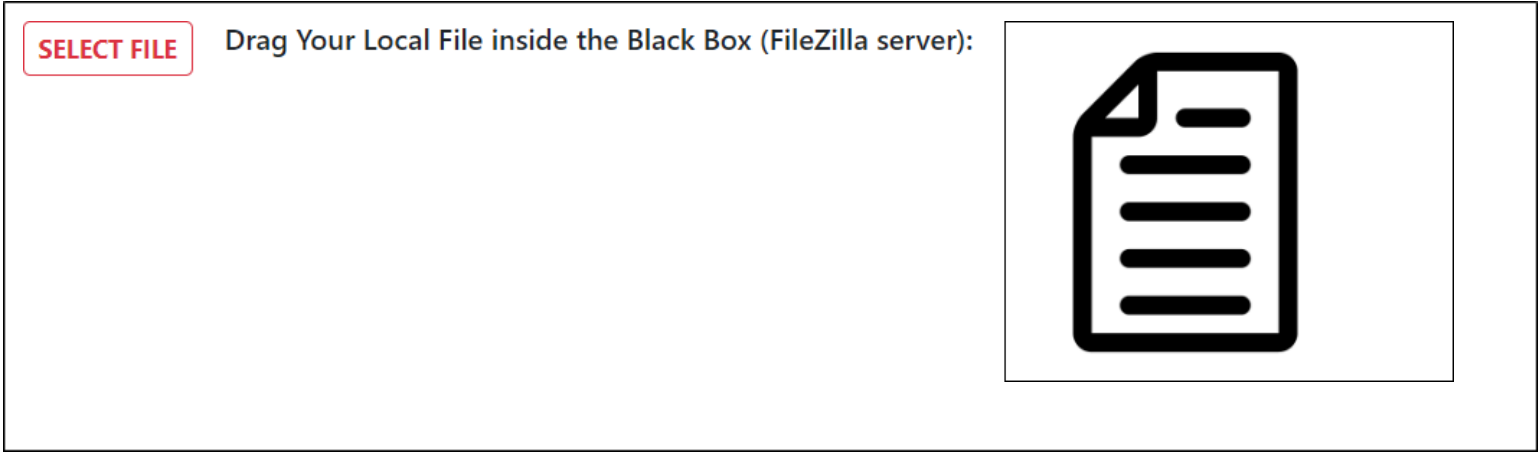
Click on the “**SELECT FILE**” red color button and select any file from your computer.

After selecting any one file it will look like this: you have selected one file from your local files.

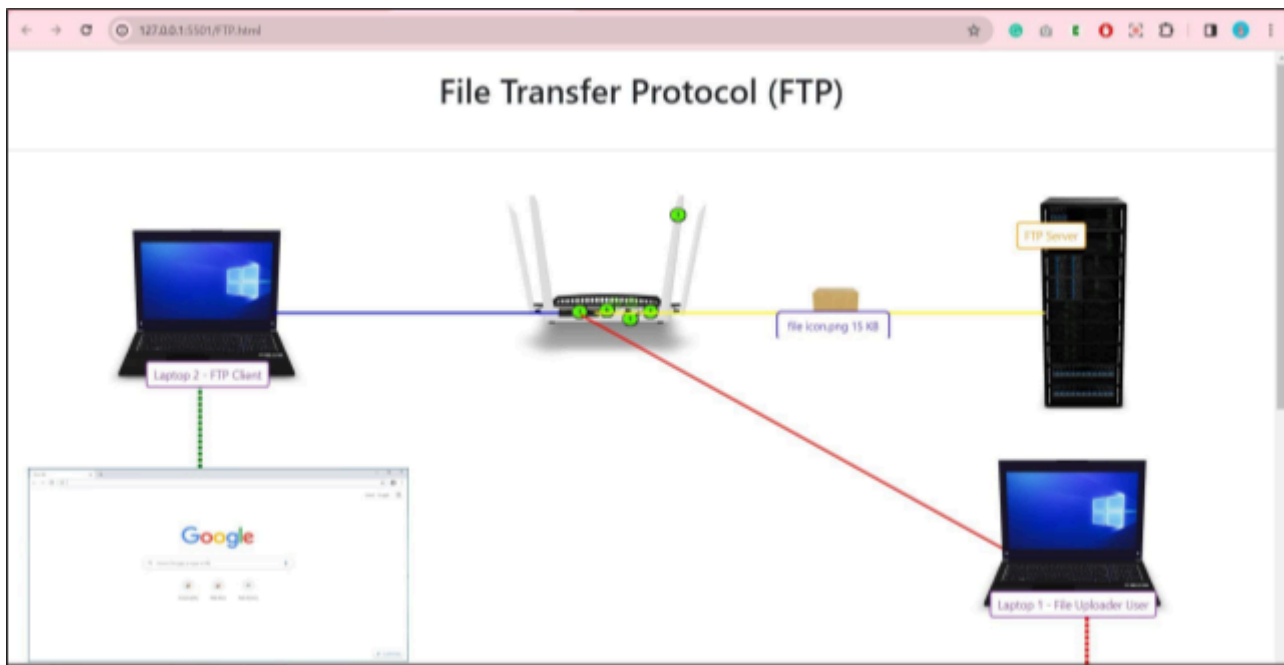


Drag that file into black box using mouse pointer

It Will look like this something



After a process of uploading of file will start in packets by packets



You can see your file name and file size.

Click on the file name then you will see how the file is transferred in packets with packet details you can read.

You will get a message that file has been uploaded successfully

Packet Details

Version (4 bits): This is like the "edition" of the communication protocol being used. It tells us if it's the fourth version (IPv4) or the sixth version (IPv6).

DHL (4 bits): Think of this as the thickness of the instruction manual. It tells us how many pages (in groups of 32 bits) are in the header, which is like the cover and initial pages of the communication.

Type of Service (8 bits): This is like marking a package with special handling instructions. It helps prioritize and manage the delivery of the data, including how it handles potential network congestion.

Total Length (16 bits): This is the size of the entire package, including both the header (cover and initial pages) and the actual message (payload).

Identification (16 bits): It's like assigning a unique ID to a package. Useful when the data needs to be split into smaller parts for efficient delivery.

Flags (3 bits): These are like checkboxes indicating specific handling instructions. For example, whether the package should not be broken into smaller parts during delivery.

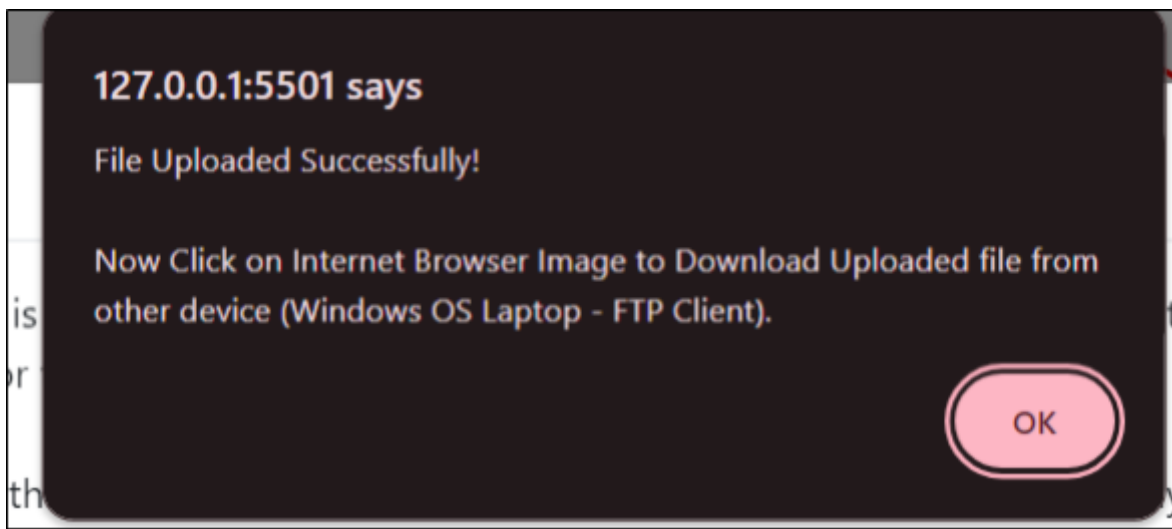
Fragment Offset (13 bits): If the package is too big and needs to be split, this tells us where each part fits in the sequence, ensuring it can be reassembled correctly.

Time to Live (8 bits): Think of this as a countdown timer. It limits the time a package is allowed to roam around the network. If the timer reaches zero, the package is discarded.

Protocol (8 bits): This specifies the language the sender and recipient will use to understand the message. For example, it might be a language like TCP for reliability or UDP for speed.

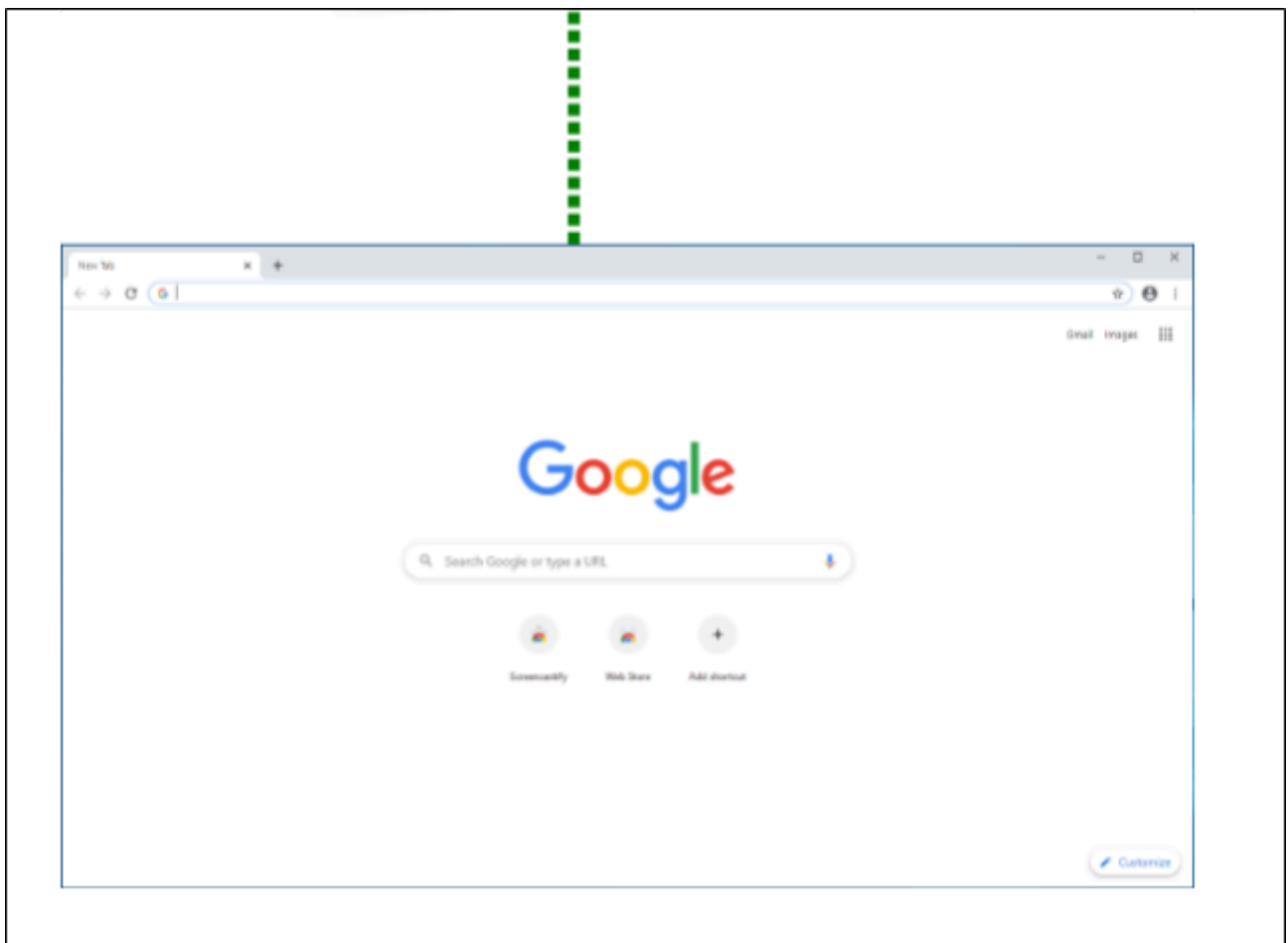
Header Checksum (16 bits): It's like a quick verification code at the top of a document. It helps ensure that the header (cover and initial pages) hasn't been damaged during transit.

Source IP Address (32 bits): This is like the return address on an envelope. It tells us where the data is coming from.

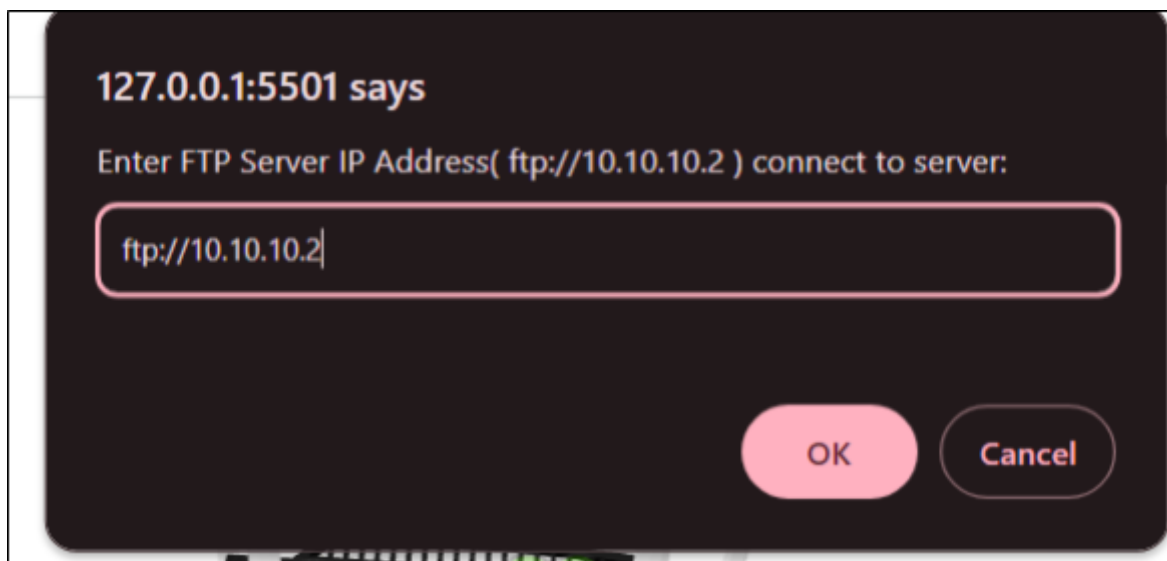
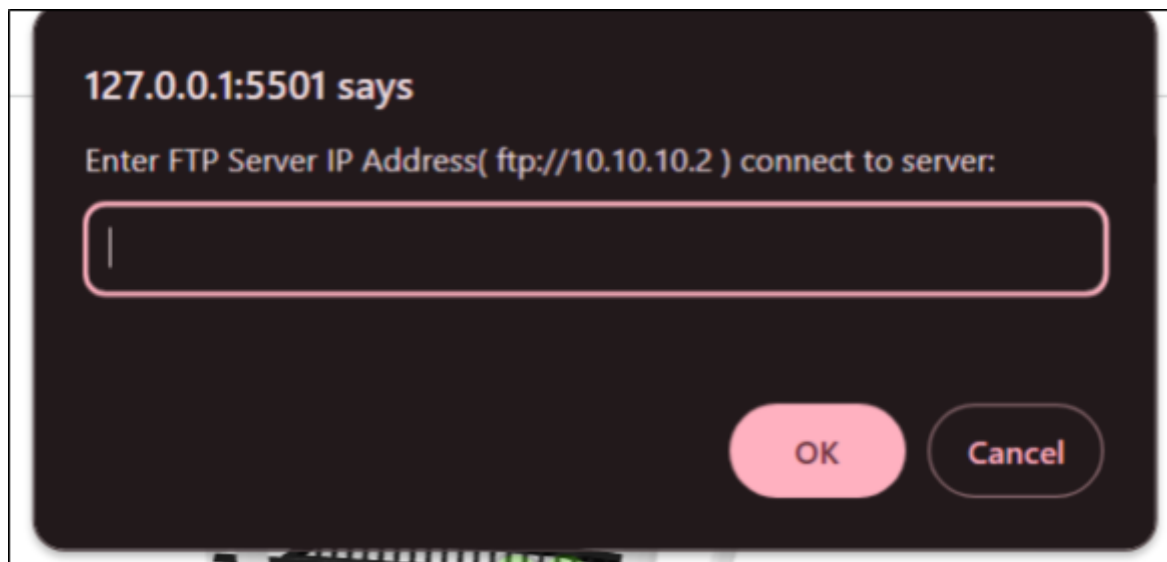


Next Part is to download a file which has been uploaded on server from another device using the same IP Address.

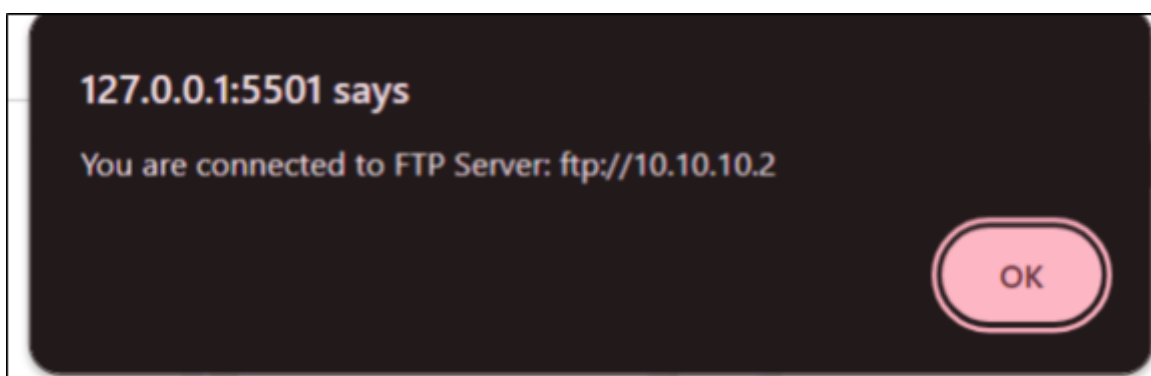
Click on the image shown below to download the file.



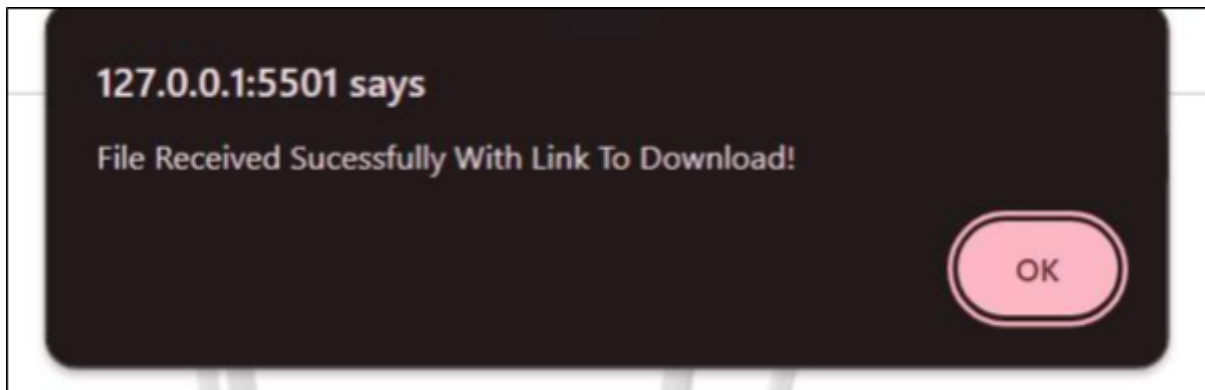
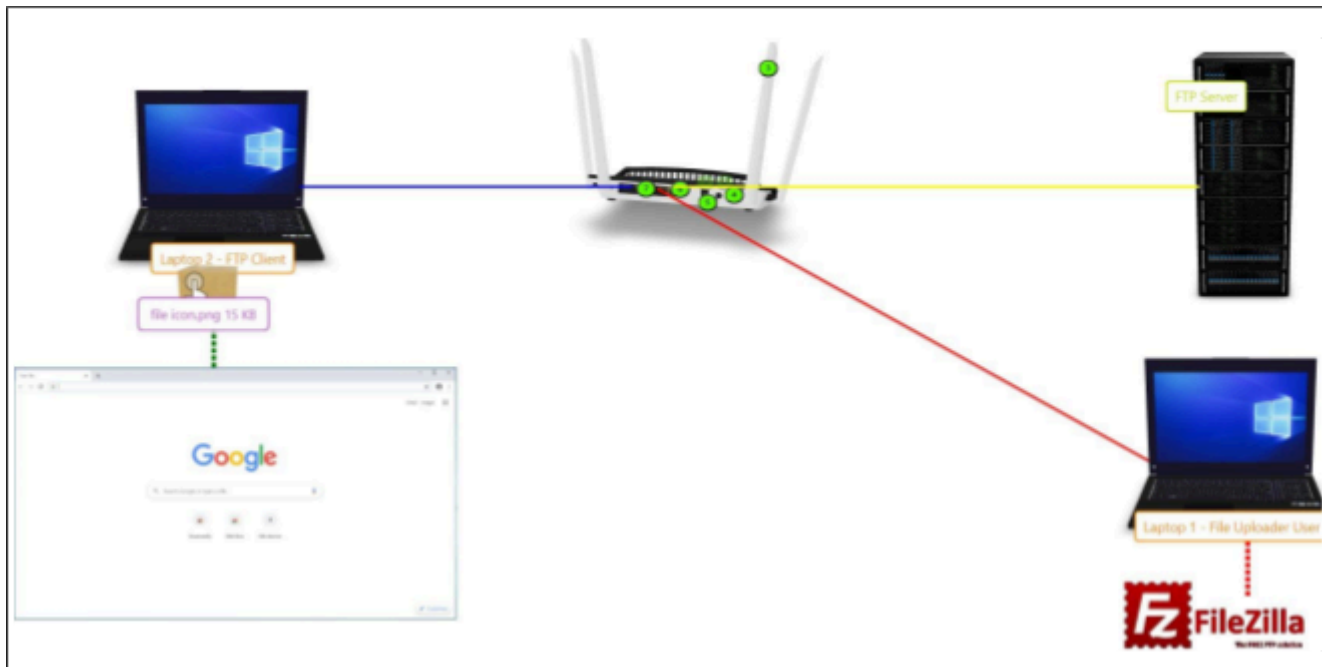
You will get a message to enter Server IP Address enter there <ftp://10.10.10.2> to get that file.



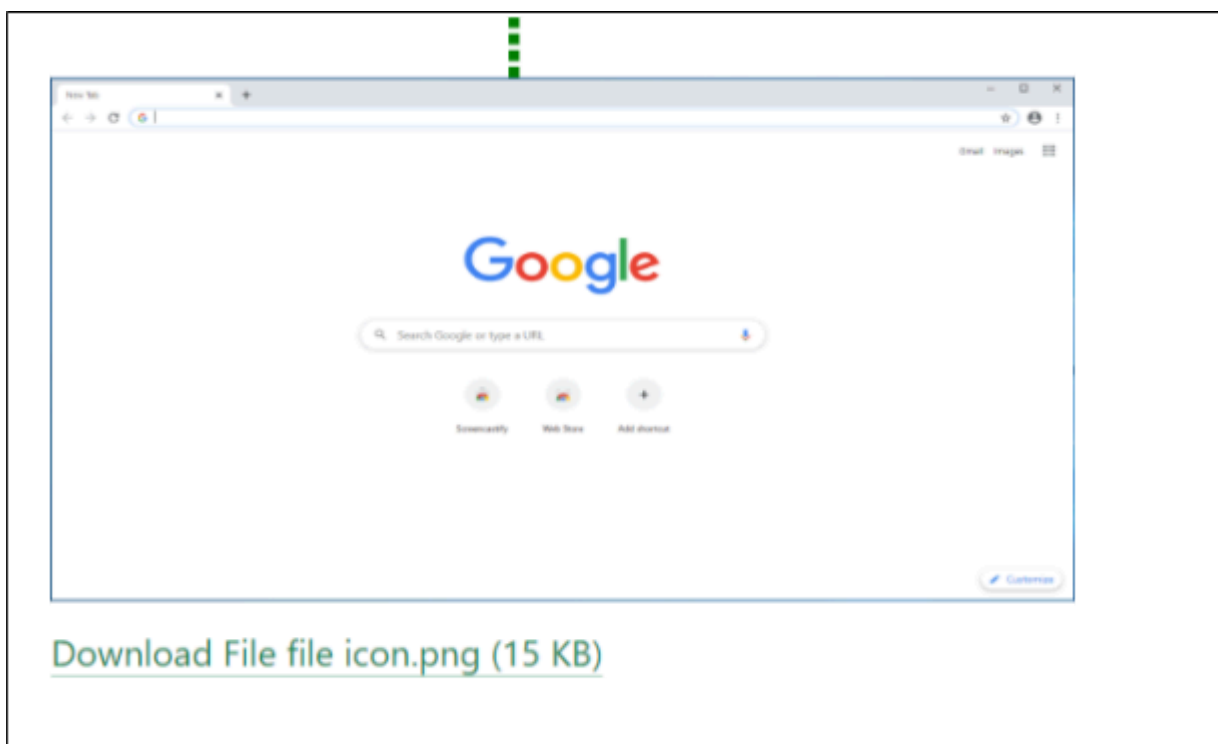
You get a successful message that you're connected to FTP Server.



Now your file will start downloading to other device Laptop 2 - FTP Client

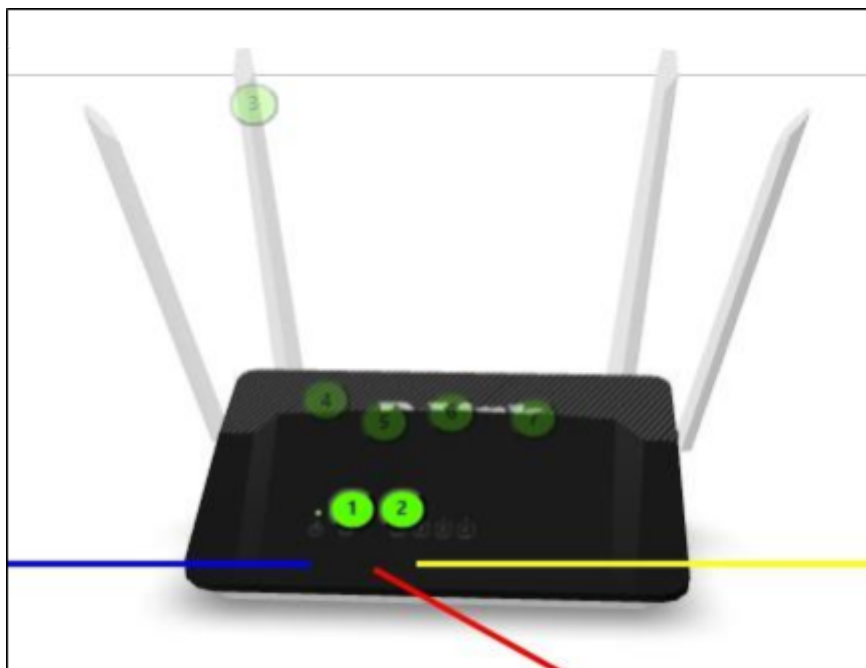
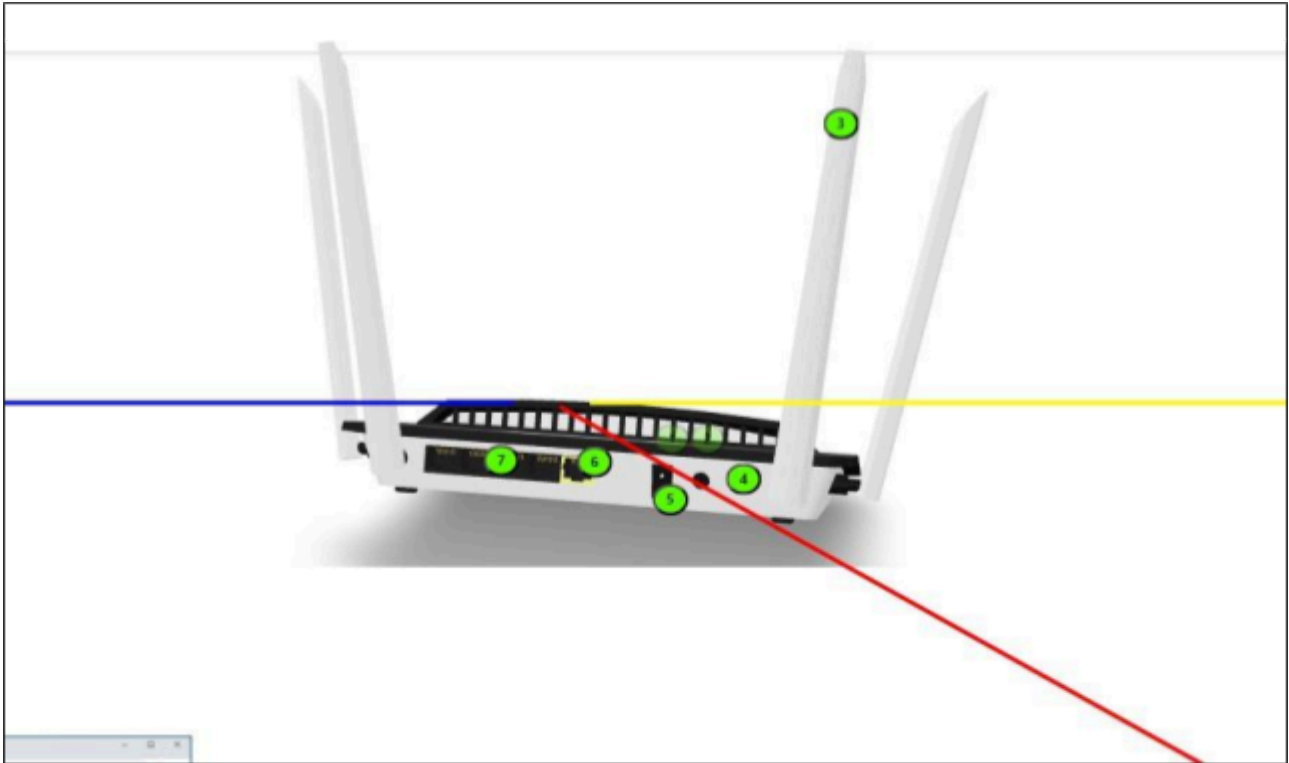


You will get the link of File Received Successfully. Now Click on the Green Color link to download the file to your device. This is how FTP works in the real world shown similarly in Augmented Reality.



You can explore more in AR not till file transferring only!! You can view how the router looks and zoom in with the mouse.

Click on green circles to know the parts of Router.



WAN/Internet Port



Connect modem or transceiver to link home network to internet.



Okay