# Ethical Remote Access Tool - Setup and Usage Guide

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## 1. Installation and Setup Procedure

### Step 1: Install Python and Dependencies

Ensure that Python 3.6 or later is installed on your computer. You can download Python from https://www.python.org/downloads/.

Once Python is installed, use the following command to install all the required dependencies:

pip install pyqt5 pyautogui opencv-python numpy pillow

### Step 2: Download and Prepare the Tool

Download the source code for the Ethical Remote Access Tool and navigate to the folder where it is saved. Make sure all files, including the main script (remote\_access\_tool.py), are in the same directory.

### Step 3: Start the Tool

Run the tool by navigating to the directory where it is saved and executing:

python remote\_access\_tool.py

## 2. Setting Up the Instructor (Server) Application

### Step 1: Launch the Instructor Dashboard

When you first run the tool, you will be presented with the Instructor Dashboard. The dashboard will have different buttons for submitting your details, starting the network server, managing chat, and viewing students' screens.

### Step 2: Submit Your Details

Enter your name, email address, and phone number in the provided fields. Click the 'Submit Details' button to save this information. This ensures students know who they are connecting to and provides transparency.

### Step 3: Set Notification Email

Instructors can enter an email address in the 'Notification Email' field to receive notifications when students connect. Click 'Set Notification Email' to apply the setting.

### Step 4: Start the Server

Click 'Start Network Server'. This will start the server and make it listen for incoming connections from students. By default, the server listens on port 5000, and your server IP will be displayed in the dashboard.

### Step 5: Configure Port Forwarding (Optional)

If students need to connect over the internet rather than a local network: Click 'Setup DynDNS' or 'Setup NoIP' to get instructions on configuring these services. This allows you to set up Dynamic DNS for easier connection without requiring a static IP address.

### Step 6: Manage Connections

View Screens: Use the 'View Screens' button to see the screens of connected students.

Group Chat: Use the 'Group Chat' button to start a text chat session with all connected students.

Video Chat: Use the 'Start Video Chat' button to open video connections with each student.

## 3. Setting Up the Student (Client) Application

### Step 1: Launch the Student Client

Students will use the same tool (remote\_access\_tool.py) but as clients. After running the tool, they will see the interface with an option to connect to the instructor.

### Step 2: Connect to Server

In the 'Server IP Address' field, the student should enter the IP address provided by the instructor. Click the 'Connect to Server' button to initiate the connection to the instructor’s server. The default port is 5000, so ensure that this port is open and available.

### Step 3: Submit Student Details

Once connected, students must enter their name, email address, and phone number. Click 'Submit Details' to proceed. This information is shared with the instructor for accountability and identification purposes.

### Step 4: Follow Instructor’s Instructions

Once connected, students should follow the instructions provided by the instructor: Participate in screen sharing, use the group chat for real-time communication, and video chat with the instructor when required.

## 4. Example Workflow for Remote Class Session

Instructor: Launches the server and waits for students to connect. Shares instructions and manages sessions, switching between viewing screens, group chatting, and video conferencing.

Students: Connect to the server using the provided IP address, submit their contact details, and participate in group chat, video chat, and screen sharing as per instructor guidance.

## 5. Security and Best Practices

Port Forwarding: If connecting over the internet, ensure that the correct ports are forwarded through your router. Services like DynDNS or NoIP can help manage dynamic IPs.

Network Security: Use a secure internet connection. Avoid public Wi-Fi networks for sensitive interactions.

Data Privacy: Only share server IP addresses with trusted participants to prevent unauthorized access.

## 6. Troubleshooting Common Issues

### Port in Use

If you get an error indicating that the port is in use, change the port number in the source code or close any other applications using the same port.

### Unable to Connect

Ensure the server IP address is correct. Check that the server is running and listening on the correct port.

### Dependencies Not Installed

Run the following command to ensure all dependencies are installed:

pip install pyqt5 pyautogui opencv-python numpy pillow

## 7. Additional Tips for Smooth Operation

Keep IP Addresses Handy: The instructor should share their server IP address with students before starting a session. This can be shared via email or chat for easy access.

Restarting Server: If a session ends unexpectedly, the instructor should restart the server and share the new IP address or any changes in connection details.

Dynamic DNS: If the instructor’s IP changes frequently (common with residential internet connections), use DynDNS or NoIP to provide a stable domain name that students can use to connect.