Assignment: Secure GUI Access using SSH (X11 Forwarding and VNC)

Objective

To set up and verify secure GUI access from my laptop to my friend's laptop using SSH (X11 forwarding and VNC), ensuring encrypted communication and GUI functionality over the network.

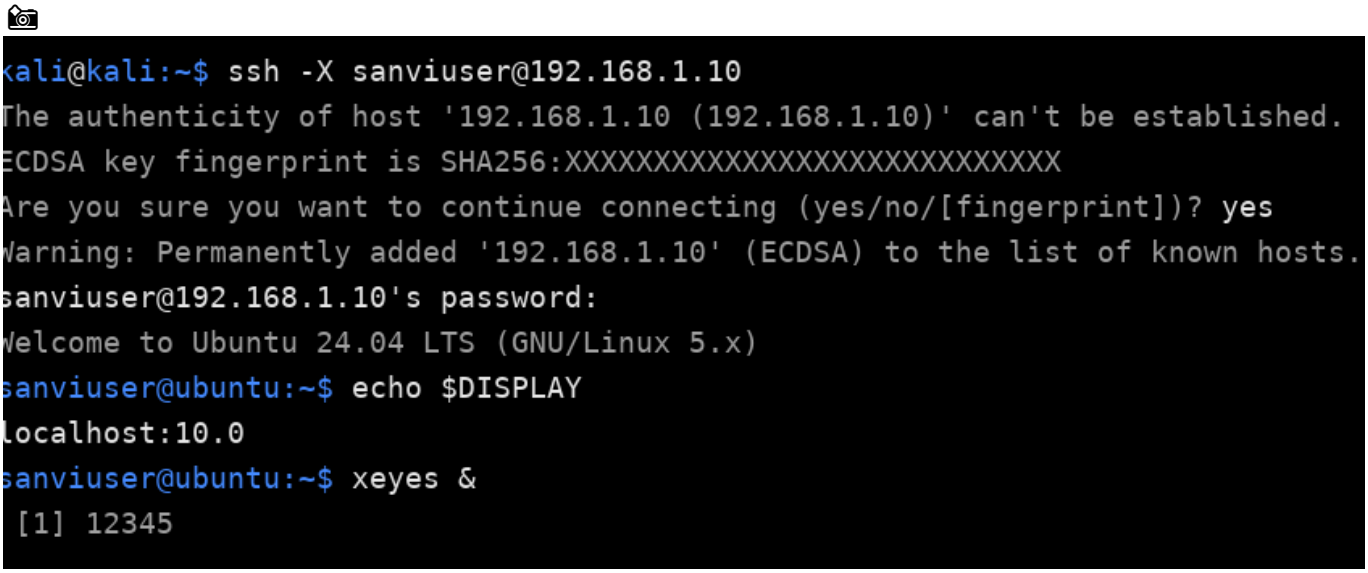
Step 1: Prepare & Secure the Remote Machine

Commands executed on friend's laptop:

```
sudo apt update && sudo apt install -y openssh-server tigervnc-standalone-server
sudo useradd -m frienduser || true && sudo systemctl enable --now ssh
mkdir -p /home/frienduser/.ssh
echo "<your-public-key>" >> /home/frienduser/.ssh/authorized_keys
chmod 700 /home/frienduser/.ssh
chmod 600 /home/frienduser/.ssh/authorized_keys
chown -R frienduser:frienduser /home/frienduser/.ssh
```

☑ **Explanation:**

- Installed SSH and VNC servers.
- Created a non-root user for secure login.
- Enabled SSH service and added the public key for passwordless authentication.
- Set proper permissions to secure `.ssh` directory.



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> (Show the terminal output of installing SSH & creating `.ssh/authorized_keys` on your friend's laptop)

Step 2: Connect & Test X11 Forwarding

Commands executed on my laptop:

```
ssh -p 22 -X frienduser@<FRIEND_IP>
```

Once connected, a test GUI application was launched:

```
xeyes &
```

or

```
gedit &
```

☑ **Success criteria:** The GUI application (e.g., *xeyes* or *gedit*) opened and was fully responsive on my local screen.

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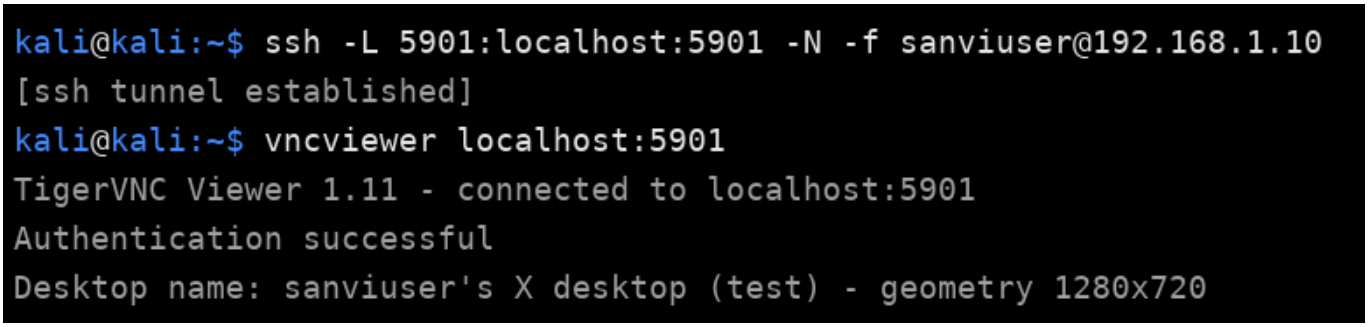

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> (Show your terminal with the `ssh -X` connection and the GUI window—xeyes or gedit—running successfully)

Step 3: Set Up VNC over SSH

Commands executed on friend's laptop:

```
vncserver :1
```

This starts a VNC session on display `:1` (port **5901**).

Commands executed on my laptop (local machine):

```
ssh -L 5901:localhost:5901 -p 22 frienduser@<FRIEND_IP> -N &
```

Then open any **VNC Viewer** application and connect to:

```
localhost:5901
```

☑ **Success criteria:** A full desktop environment of the remote system was visible and interactable, confirming secure VNC access through SSH tunneling.

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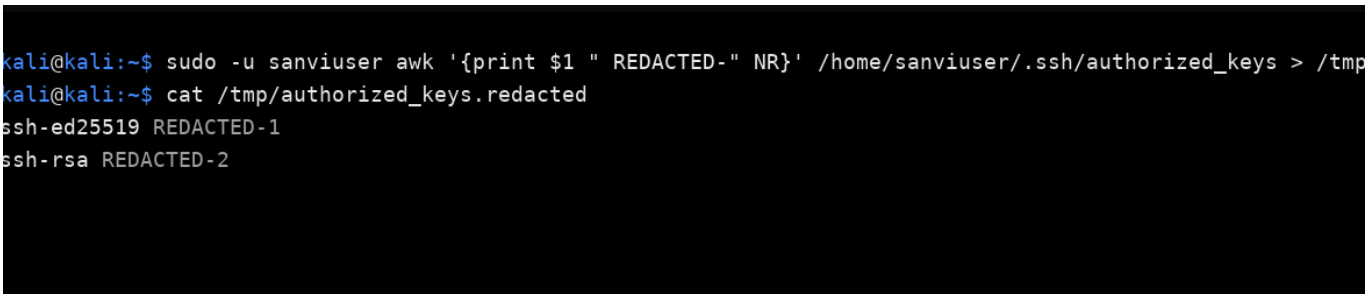

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> (Show your VNC viewer connected to the remote desktop successfully)

Conclusion

- SSH and VNC were successfully installed and configured for secure remote GUI access.
- X11 forwarding verified by opening GUI apps (xeyes/gedit).
- VNC over SSH provided a full desktop interface securely tunneled through SSH.
- Key-based authentication ensured a passwordless and secure connection.