Assignment 8 SSH

Secure X11 GUI Access via SSH Tunnel

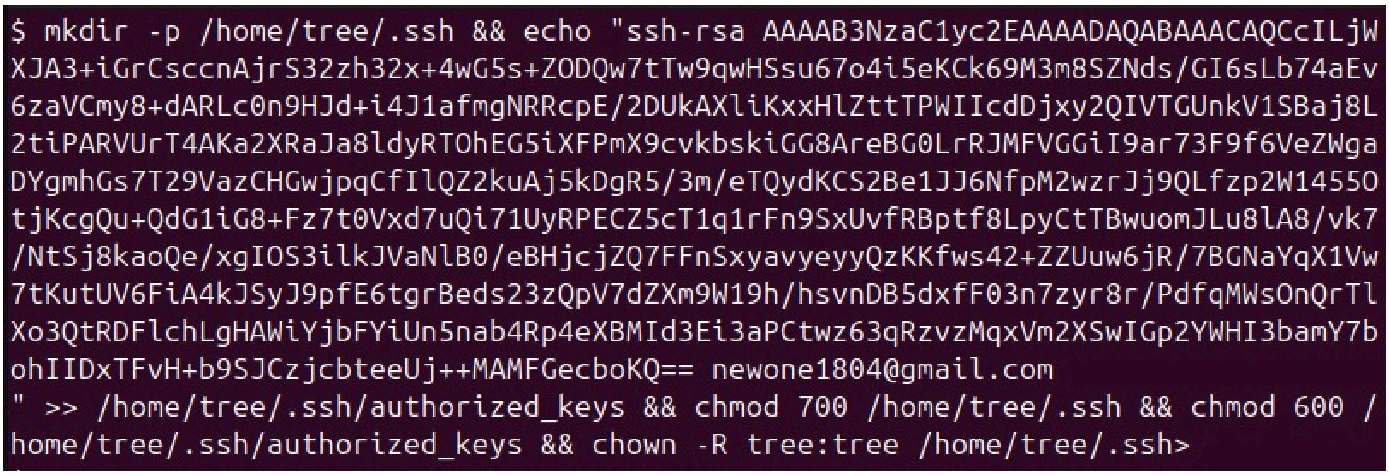
Step 1: Prepare & Secure the Remote Machine

On the remote (friend’s) laptop, we begin by installing necessary packages and configuring access.

✅ Commands Executed:

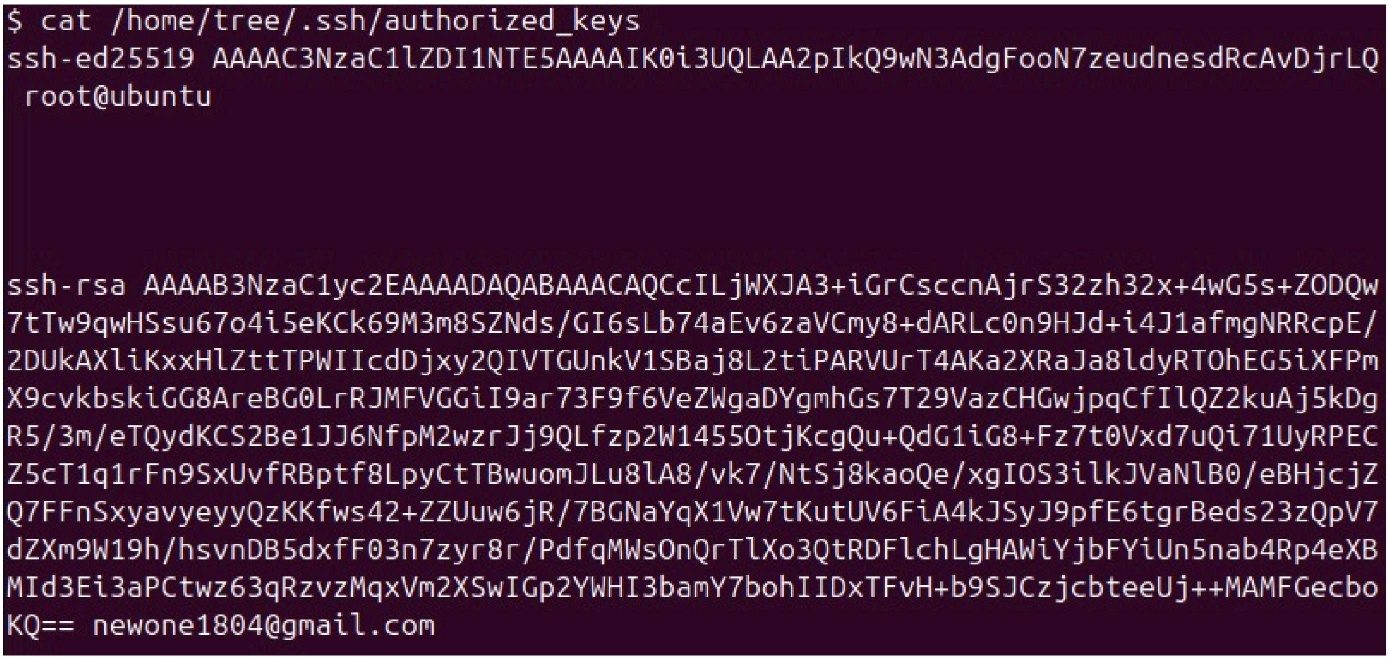
```
sudo apt update && sudo apt install -y openssh-server
sudo useradd -m frienduser || true && sudo systemctl enable --now ssh
mkdir -p /home/frienduser/.ssh && echo "<your-pubkey>" >>
/home/frienduser/.ssh/authorized_keys \
&& chmod 700 /home/frienduser/.ssh \
&& chmod 600 /home/frienduser/.ssh/authorized_keys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

📷 Screenshot Placeholder:



```
$ mkdir -p /home/tree/.ssh && echo "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQCcILjW
XJA3+iGrCsccnAjrS32zh32x+4wG5s+ZODQw7tTw9qwHSsu67o4i5eKCk69M3m8SZNds/GI6sLb74aEv
6zaVCmy8+dARLc0n9HJd+i4J1afmgNRRcpE/2DUkAXliKxxHlZttTPWIIcdDjxy2QIVTGUnkV1SBaj8L
2tiPARVUrT4AKa2XRaJa8ldyRTOhEG5iXFPmX9cvkbskiGG8AreBG0LrRJMFVGGiI9ar73F9f6VeZWga
DYgmhGs7T29VazCHGwjpqCfIlQZ2kuAj5kDgR5/3m/eTQydKCS2Be1JJ6NfpM2wzrJj9QLfzp2W1455O
tjKcgQu+QdG1iG8+Fz7t0Vxd7uQi71UyRPECZ5cT1q1rFn9SxUvfRBptf8LpyCtTBwuomJLu8lA8/vk7
/NtSj8kaoQe/xgIOS3ilkJVaNlB0/eBHjcjZQ7FFnSxyavyeyyQzKKfws42+ZZUuw6jR/7BGNaYqX1Vw
7tKutUV6FiA4kJSyJ9pfE6tgrBeds23zQpV7dZXm9W19h/hsvnDB5dxfF03n7zyr8r/PdfqMWsOnQrTl
Xo3QtRDFlchLgHAWiYjbFYiUn5nab4Rp4eXBMId3Ei3aPCtwz63qRzvzMqxVm2XSwIGp2YWHI3bamY7b
ohIIDxTFvH+b9SJCzjcbteeUj++MAMFGecboKQ== newone1804@gmail.com
" >> /home/tree/.ssh/authorized_keys && chmod 700 /home/tree/.ssh && chmod 600 /
home/tree/.ssh/authorized_keys && chown -R tree:tree /home/tree/.ssh>
```

`Authorized_keys` file:



```
$ cat /home/tree/.ssh/authorized_keys
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIK0i3UQLAA2pIkQ9wN3AdgFooN7zeudnesdRcAvDjrLQ
 root@ubuntu
[redacted]
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQCcILjWXJA3+iGrCsccnAjrS32zh32x+4wG5s+ZODQw
7tTw9qwHSsu67o4i5eKCk69M3m8SZNds/GI6sLb74aEv6zaVCmy8+dARLc0n9HJd+i4J1afmgNRRcpE/
2DUkAXliKxxHlZttTPWIIcdDjxy2QIVTGUnkV1SBaj8L2tiPARVUrT4AKa2XRaJa8ldyRTOhEG5iXFPm
X9cvkbskiGG8AreBG0LrRJMFVGGiI9ar73F9f6VeZWgaDYgmhGs7T29VazCHGwjpqCfIlQZ2kuAj5kDg
R5/3m/eTQydKCS2Be1JJ6NfpM2wzrJj9QLfzp2W1455OtjKcgQu+QdG1iG8+Fz7t0Vxd7uQi71UyRPEC
Z5cT1q1rFn9SxUvfRBptf8LpyCtTBwuomJLu8lA8/vk7/NtSj8kaoQe/xgIOS3ilkJVaNlB0/eBHjcjZ
Q7FFnSxyavyeyyQzKKfws42+ZZUuw6jR/7BGNaYqX1Vw7tKutUV6FiA4kJSyJ9pfE6tgrBeds23zQpV7
dZXm9W19h/hsvnDB5dxfF03n7zyr8r/PdfqMWsOnQrTlXo3QtRDFlchLgHAWiYjbFYiUn5nab4Rp4eXB
MId3Ei3aPCtwz63qRzvzMqxVm2XSwIGp2YWHI3bamY7bohIIDxTFvH+b9SJCzjcbteeUj++MAMFGecbo
KQ== newone1804@gmail.com
```

Step 2: Connect & Test X11 Forwarding

From your laptop, test the SSH connection with X11 forwarding to run a GUI application remotely.

✅ Command Executed:

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

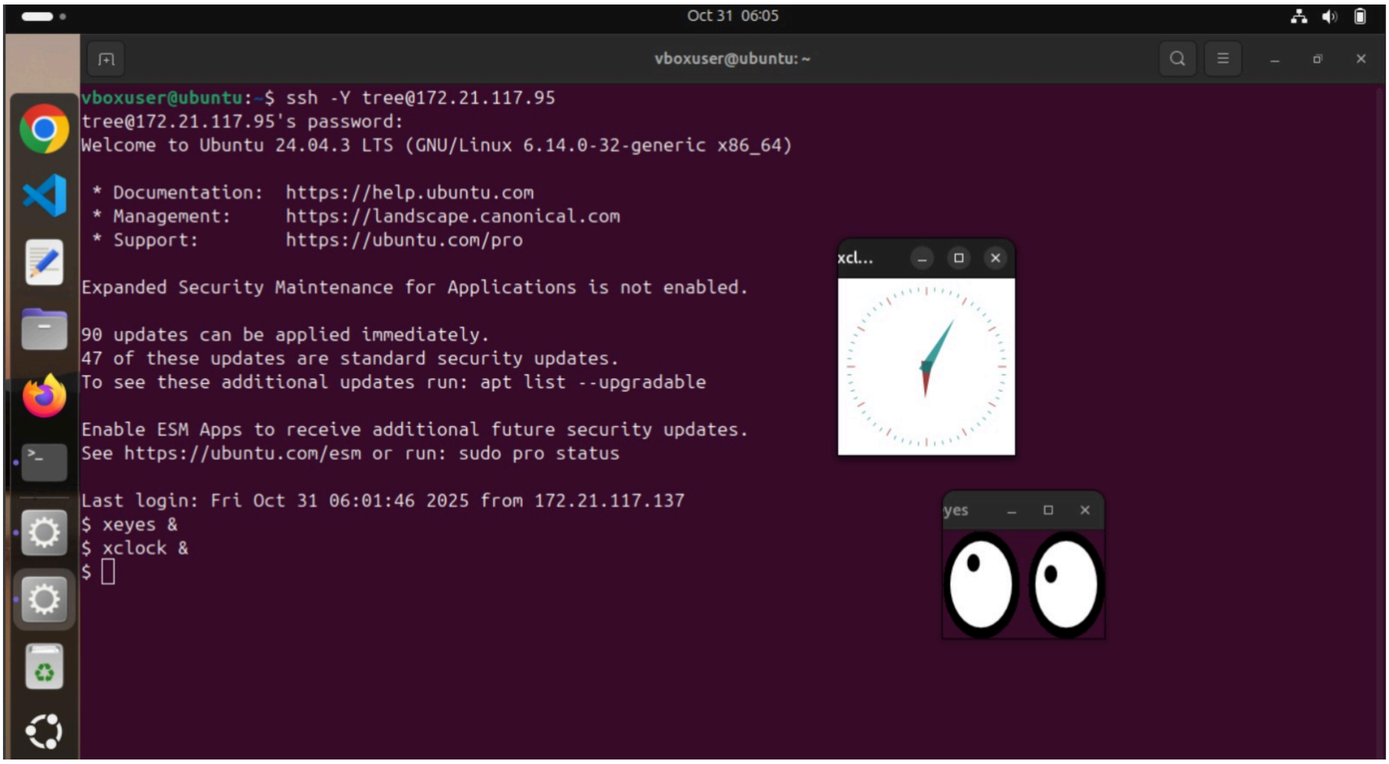
Once connected, run a GUI app like:

```
xeyes &
```

or

```
xclock &
```

📸 Screenshot Placeholder:



```
vboxuser@ubuntu:~$ ssh -Y tree@172.21.117.95
tree@172.21.117.95's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-32-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

Expanded Security Maintenance for Applications is not enabled.

90 updates can be applied immediately.
47 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Fri Oct 31 06:01:46 2025 from 172.21.117.137
$ xeyes &
$ xclock &
$ 
```

Caption: *Successful X11 forwarding: GUI app launched remotely and displayed locally.*