

# Enabling Certificate Authentication in SSH

LPIC-2: Linux Engineer (202-450)

## Objectives:

At the end of this episode, I will be able to:

1. Describe how SSH uses certificate-based authentication.
2. Configure a Linux user account to use certificates to authenticate with SSH.
3. Strengthen the certificates used by an SSH server.

Additional resources used during the episode can be obtained using the download link on the overview episode.

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- Enabling Certificate Authentication in SSH
    - Certificate-based Authentication
    - Configuring User Keys
    - Configuring Server Keys
  - Certificate-based Authentication
    - Improved security
      - Virtually impossible to brute force
      - Much more secure than passwords
      - Key lengths are typically over a thousand characters
    - Certificate
      - Private key is generated by the client
      - Public key is added to their home directory on the server
      - The public key can be loaded to multiple servers
  - Configuring User Keys
    1. Generate a key on your client
      - `ssh-keygen`
      - Keys are output to `~/.ssh`
      - `id_rsa` is the private key
      - `id_rsa.pub` is the public key
    2. Copy your key from the client to the server
      - `ssh-copy-id <username>@<server_name>`
  - Disable password authentication on the server
    1. `sudoedit /etc/ssh/sshd_config.d/hardened.conf`
    2. Set `PasswordAuthentication no` on the server
  - Configuring Server Keys
    1. Delete pre-existing keys
      - `sudo rm /etc/ssh/ssh_host*`
    2. Generate new keys
      - `sudo ssh-keygen -q -N "" -t rsa -b 4096 -f /etc/ssh/ssh_host_rsa_key`
        - `q` Quiet output
        - `N` Passphrase
        - `t` Type
        - `b` Bits
        - `f` Filename
      - `sudo ssh-keygen -q -N "" -t ed25519 -f /etc/ssh/ssh_host_ed25519_key`
    3. Update the configuration to use the new keys

- sudoedit /etc/ssh/sshd\_config.d/hardened.conf
  - HostKey /etc/ssh/ssh\_host\_rsa\_key
  - HostKey /etc/ssh/ssh\_host\_ed25519\_key
  - HostKeyAlgorithms ssh-ed25519,ssh-ed25519-cert-v01@openssh.com,sk-ssh-ed25519@openssh.com,sk-ssh-ed25519-cert-v01@openssh.com,rsa-sha2-256,rsa-sha2-512,rsa-sha2-256-cert-v01@openssh.com,rsa-sha2-512-cert-v01@openssh.com