VE482 - Lab 2

Introduction to Operating Systems

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1. Minix 3

- In Minix 3, how to manage software, i.e. install, remove, update, etc.?

  Program `pkgin` is used to manage software.

  - install: `pkgin install [Name]`
  - remove: `pkgin remove [Name]`
  - update: `pkgin update`

- What is the purpose of the commands ifconfig, adduser, and passwd?

  - `ifconfig`: used to view and change the configuration of the network interfaces
  - `adduser`: create new user account
  - `passwd`: set or modify user password

2. Working on a remote server

- Setup an SSH server on Minix 3

```
pkgin update
pkgin install openssh
vi /usr/pkg/etc/ssh/sshd_config
# change Port 22 to Port 2222
ifconfig
# check IP address (10.21.55.8)
```

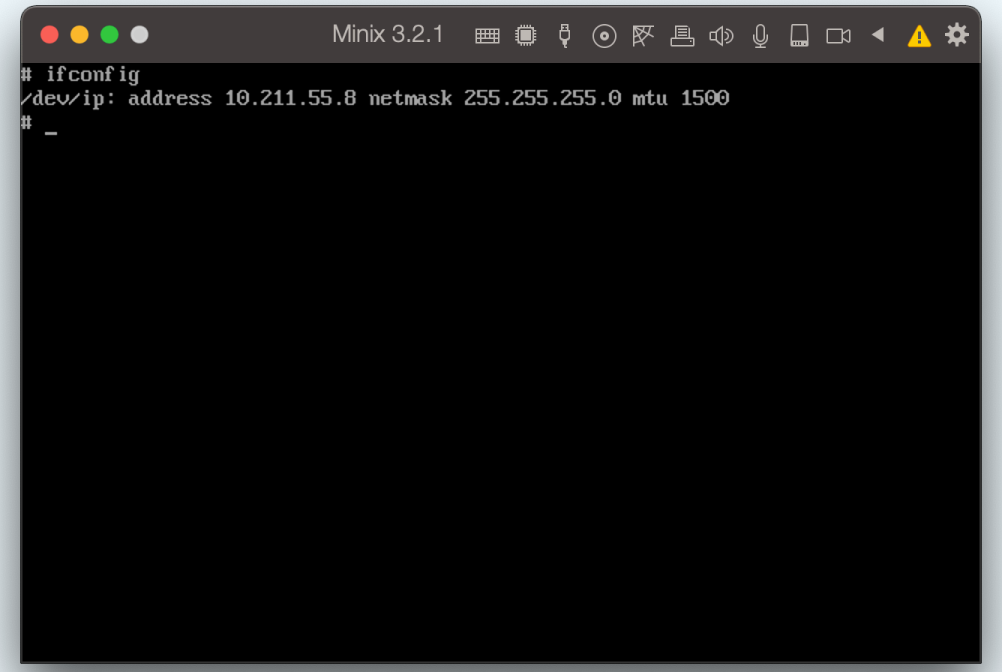

Figure 1: ifconfig

- Log into Minix 3 using this new SSH server setup

```
ssh root@10.21.55.8
# config quick access
vim ~/.ssh/config
# add following configuration
Host    Minix
        HostName    10.21.55.8
        Port        2222
        User        root
# save and exit vim
ssh minix # connect to minix
```

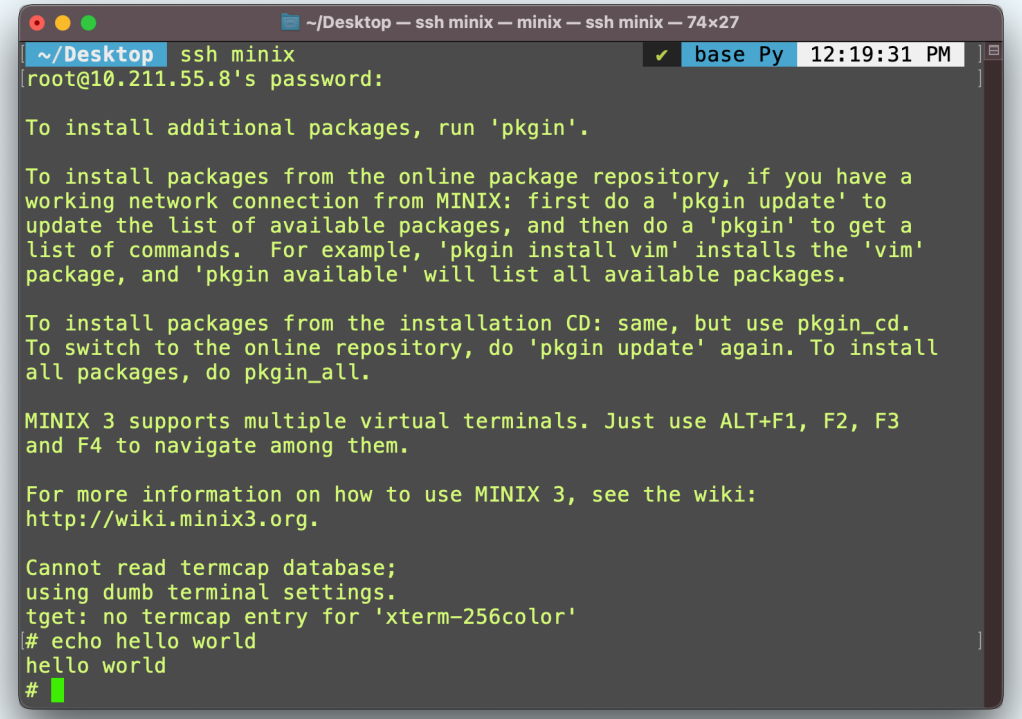

Figure 2: ssh

- What is the default SSH port?

  The default SSH port is 22.

- List and explain the role of each the file in the $HOME/.ssh directory
  - `config`: system-wide configuration for SSH
  - `id_rsa`: private key
  - `id_rsa.pub`: public key
  - `known_hosts`: contains a list of public keys for all the hosts which the user has connected to
- Briefly explain how key-only authentication works in SSH

  Anyone with a copy of the public key can encrypt data which can then only be read by the person who holds the corresponding private key. Once an SSH server receives a public key from a user and considers the key trustworthy, the server marks the key as authorized in its authorized_keys file. And the possession of private key is proof of the user's identity. Only a user in possession of a private key that corresponds to the public key at the server will be able to authenticate successfully.
- Generate a key-pair on the host system and use it to log into Minix 3 without a password

```
1  ssh-keygen -t rsa # generate a key-pair
2  ssh-copy-id minix # install an SSH key on minix as an
       authorized key
```

3. Basic git

- `help`: Display help information about Git
- `init`: Create an empty Git repository or reinitialize an existing one
- `checkout`: Switch branches or restore working tree files
- `branch`: List, create, or delete branches
- `push`: Update remote refs along with associated objects
- `pull`: Fetch from and integrate with another repository or a local branch
- `merge`: Join two or more development histories together
- `add`: Add file contents to the index
- `diff`: Show changes between commits, commit and working tree, etc
- `tag`: Create, list, delete or verify a tag object signed with GPG
- `log`: Show commit logs
- `fetch`: Download objects and refs from another repository
- `commit`: Record changes to the repository
- `clone`: Clone a repository into a new directory
- `reset`: Reset current HEAD to the specified state