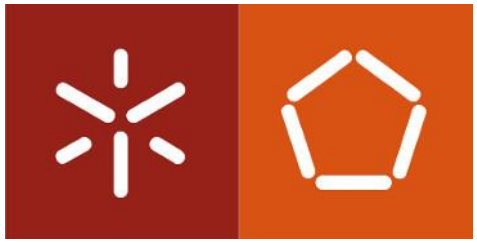
Cloud Computing Applications and Services
(Aplicações e Serviços de Computação em Nuvem)

Warm-up

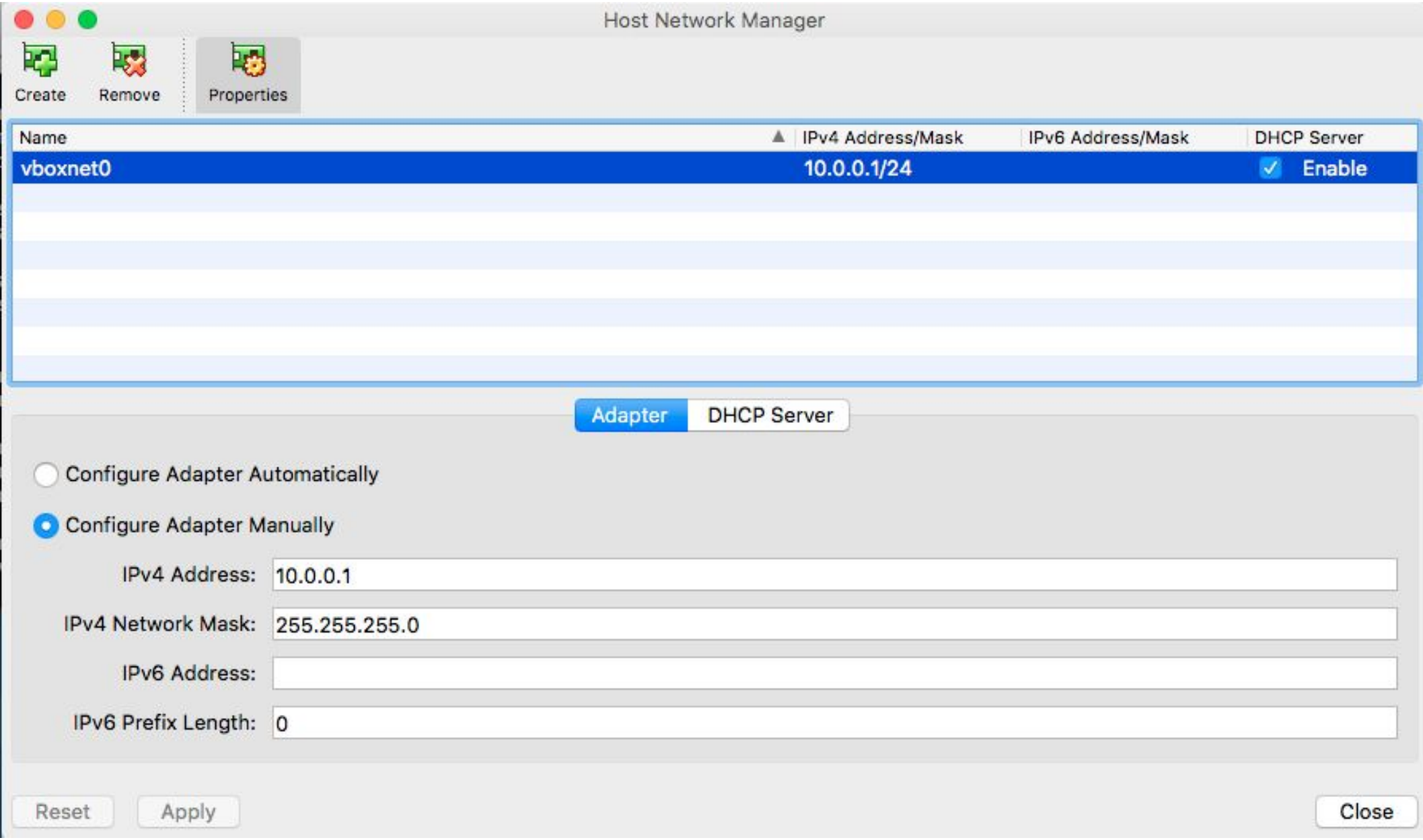
University of Minho
2021/2022



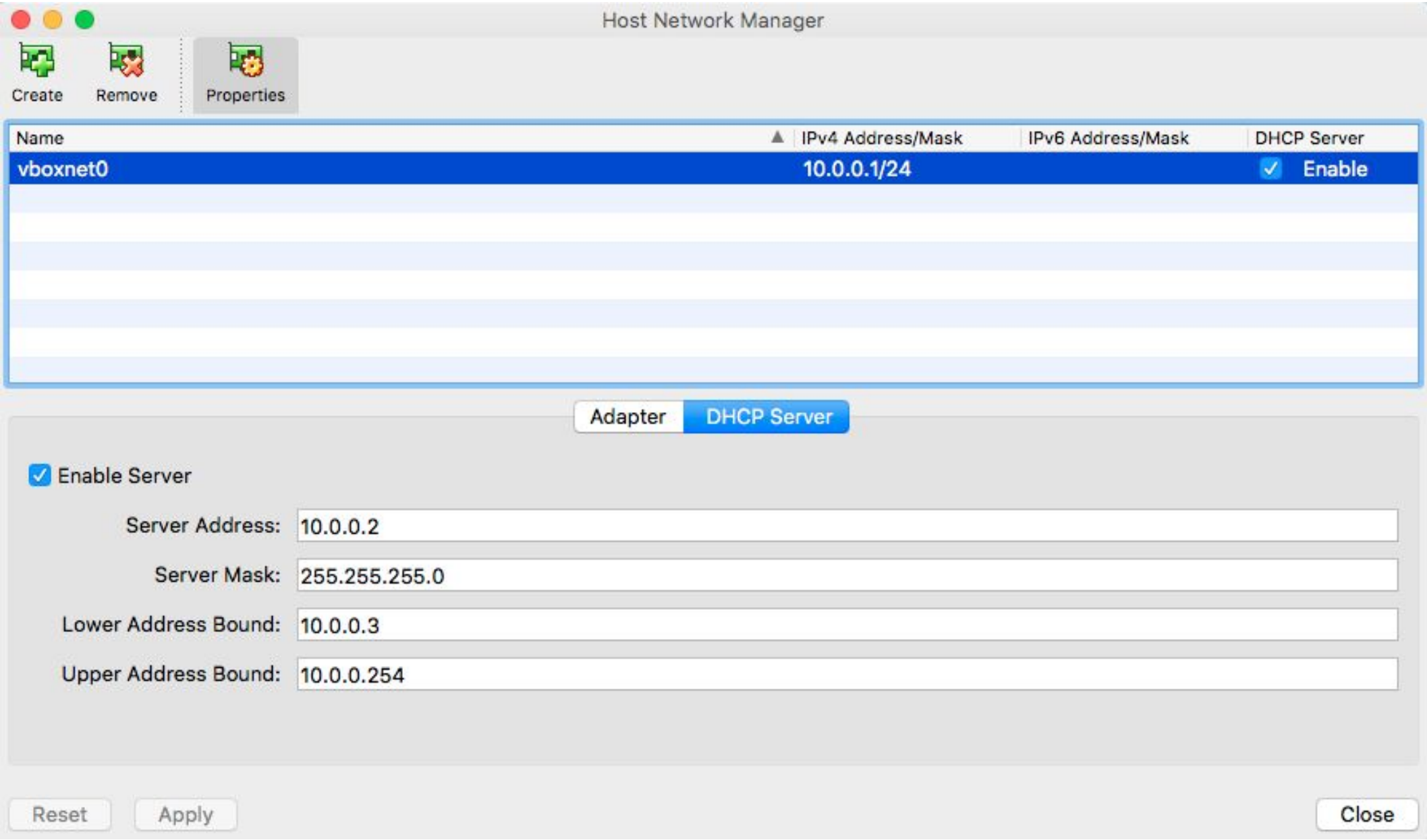
VirtualBox

- Install VirtualBox 6.1 (https://www.virtualbox.org)
- Configure a host-only network
  - File -> Host Network Manager (Mac OSX)
  - create a host adapter for network 10.0.0.X

Adapter Creation (example)

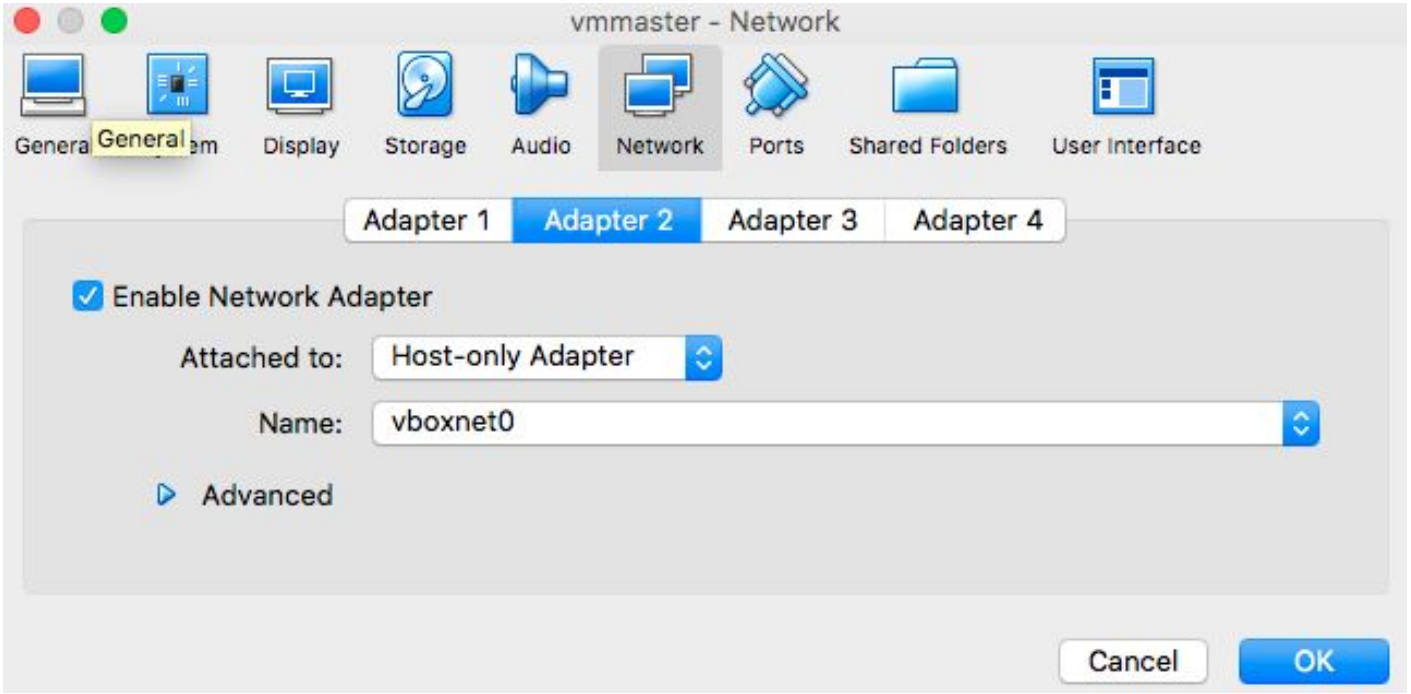


Adapter Creation (example)



VM Setup

- Setup one Ubuntu (64-bit) virtual machine
- Plan CPU, RAM (minimum: 512 MB) and Disk resources so that multiple VMs can be deployed within the same host
  - VDI disk with fixed size (minimum: 5 GB)
  - enable network adapter 2, and link it to the host network created previously (vboxnet0)



OS Install

- Install Ubuntu from ISO file (Ubuntu 20.04 server)
  - install OpenSSH server package
- Launch the VM and login using the Virtualbox console
  - “ip add” command lists the available network interfaces
  - Configure networks (at /etc/netplan/*.yaml add)

```
enp0s8:
    addresses:
        - 10.0.0.3/24
```

  - run “sudo netplan apply”

SSH

- Test SSH from host to the VM
- Prepare the VM for SSH keys authentication (run at VM)
  - mkdir -p ~/.ssh
  - chmod 700 ~/.ssh
- Create and copy your ssh public key to the VM (run at host)
  - ssh-keygen
  - ssh-copy-id username@VM_IP
- Turn off password authentication (run at VM)
  - at /etc/ssh/sshd_config add:

    PasswordAuthentication no
    PubkeyAuthentication yes

  - run “sudo systemctl restart sshd”

Clone VM

- Clone the VM to create a new one
  - generate new MAC for the Network Adapters
  - create a full clone
- Launch the new VM and configure network (/etc/netplan -> addresses 10.0.0.4)
- Test connection between the two VMs and Host using the configured address
- [Optional] Change the new VM hostname
  - run "hostnamectl set-hostname new-hostname"
  - replace any occurrence of the existing hostname in /etc/hosts with the new one
  - reboot the VM

Automated Deployment (extra)

- Install Vagrant on your computer
  - https://www.vagrantup.com
- Use the VagrantFile provided in the class
  - Change the value for the following variables:
    - Number_VMs
    - PUBLIC_KEY_PATH
- Explore the commands:
  - vagrant box add bento/ubuntu-20.04
  - vagrant up
  - vagrant halt
  - vagrant destroy
  - The last three commands can be executed (without any additional arguments) at the folder where the VagrantFile is stored
- Check Virtualbox to see the new VMs
- Explore Vagrant's documentation