Software Platforms

LM in Computer Engineering

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Oracle Virtual Box Virtual Machines: Creation

Actions:

- Download and Install Vbox (https://www.virtualbox.org/wiki/Downloads)
- Download Latest Ubuntu Appliance (e.g., https://releases.ubuntu.com/21.04/)
- Install Vbox VM – Ubuntu 20 (or more recent) version (through Vbox Console), 2GB RAM- 10GB Disk VDI
- Start VM from Vbox Console
- Install Guest Additions
  - From Terminal
    - sudo apt-get update
    - sudo apt-get upgrade
    - sudo apt-get install build-essential module-assistant
    - sudo m-a prepare
  - From the Devices Menu
    - Install Guest Additions
- Close VM

Oracle Virtual Box Virtual Machines: Configuration

- Configure Network for SSH
  - NAT + Port Forwarding guest port 22 on host port 2222
- Configure Shared Clipboard
  - From Console Settings->General->Advanced
- Configure Shared Folders
  - From Settings->Shared Folders

  Folder Path: on Host
  Auto-mount enabled
  Make permanent enabled
  Mount Point: on Guest
- Start VM
  - From Terminal
    - sudo usermod –G vboxsf –a $USER
    - sudo apt-get install openssh-server
- Close VM

Oracle Virtual Box Virtual Machines: Control

- To list the existing Virtual Machines
  vboxmanage list vms
- To activate a Virtual Machine in headless mode (Command Line only)
  vboxmanage startvm <name> --type headless
- To list the existing active Virtual Machines
  vboxmanage list runningvms
- To see the VM properties (and most specifically IP Address)
  vboxmanage guestproperty enumerate <name>
- To learn the IP address of an active Virtual Machine
  vboxmanage guestproperty get <name> /VirtualBox/GuestInfo/Net/0/V4/IP
- To log on in an active Virtual Machine through its IP Address
  ssh localhost <Virtual Machine Address> -l username
- To log on in an active Virtual Machine through localhost port-forwarding
  ssh localhost –p <host port forwarded to guest port 22> -l username
- To power off an active Virtual Machine
  vboxmanage controlvm <name> poweroff from host OR sudo shutdown – h now from guest

Linux: Configuration of Network Tools

- Configuring Ubuntu net-tools
  sudo apt install net-tools
- Check network configuration on guest system
  ifconfig
  route
- Activate traffic grabber on guest and configure traffic saving on shared file
  sudo tcpdump -i <interface name> -v port < port number> -w <file name>
  sudo tcpdump -i <interface name> -v port < port number> -w <file name>
  sudo tcpdump -i <interface name> host <IP address>
  sudo tcpdump -i <interface name> port <port number>
  sudo tcpdump -i <interface name> -v dst port 80 -w <file name>
  sudo tcpdump -i <interface name> icmp -w <file name>

Linux: Virtual Networking Installation Test

- Set up the traffic analysis tools
  - Activate tcpdump on Guest (CLI)
  - Activate Wireshark on Host
- Test 1
  - Access Guest through ssh and Port Translation
  - Switch from NAT to Bridging and Access Guest through its IP address
- Activate tcpdump on Guest
- Activate Wireshark on Host
- Test 2
  - Run browser on Host,
  - access an external site,
  - capture traffic through Wireshark on host, and
  - look at captured traffic (in particular src/dst addresses and src/dst ports)
- Test 3
  - Run browser on Guest. Alternatively run client application based on CLI. (e.g., curl)
  - access an external site,
  - capture traffic on guest through tcpdump,
  - capture traffic on host through Wireshark,
  - Bring both files to host through shared directories,
  - Inspect and compare them (in particular src/dst addresses and src/dst ports)