Lab of 3-Network Architecture

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Scheduled labs for PR01

Session	Date	Subject	Evaluation	Deadline (23:59)
1	01/10/2024	Introduction to the Linux Operating System	**N/A**	**N/A**
2	08/10/2024	Using the shell & exploring the filesystem	Report	14/10/2024
3	15/10/2024	Working with text files, managing running processes and writing shell scripts	Report	22/10/2024
4	23/10/2024	Learning system administration, getting & managing software	Report	28/10/2024
5	29/10/2024	Wireshark introduction	Report	05/11/2024
6	06/11/2024	Protocols in action: TCP and UDP	Report	11/11/2024
7	12/11/2024	Ethernet and ARP	Report	19/11/2024
8	20/11/2024	Setting up a DHCP server	Report	25/11/2024
9	26/11/2024	Setting up a DNS server	Report	03/12/2024
10	04/12/2024	Network Address Translation	Report	09/12/2024
11	10/12/2024	Remote Access & Firewalls		**N/A**
12	18/12/2024		Blackboard test	

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Scheduled labs for PR02

Session	Date	Subject	Evaluation	Deadline (23:59)
1	02/10/2024	Introduction to the Linux Operating System	N/A	N/A
2	09/10/2024	Using the shell & exploring the filesystem	Report	15/10/2024
3	16/10/2024	Working with text files, managing running processes and writing shell scripts	Report	22/10/2024
4	23/10/2024	Learning system administration, getting & managing software	Report	29/10/2024
5	30/10/2024	Wireshark introduction	Report	05/11/2024
6	06/11/2024	Protocols in action: TCP and UDP	Report	12/11/2024
7	13/11/2024	Ethernet and ARP	Report	19/11/2024
8	20/11/2024	Setting up a DHCP server	Report	26/11/2024
9	27/11/2024	Setting up a DNS server	Report	03/12/2024
10	04/12/2024	Network Address Translation	Report	10/12/2024
11	11/12/2024	Remote Access & Firewalls		**N/A**
12	18/12/2024		Blackboard test	

Session 11

Remote Access & Firewalls

A refresher…

Command list overview – Virtual Machine

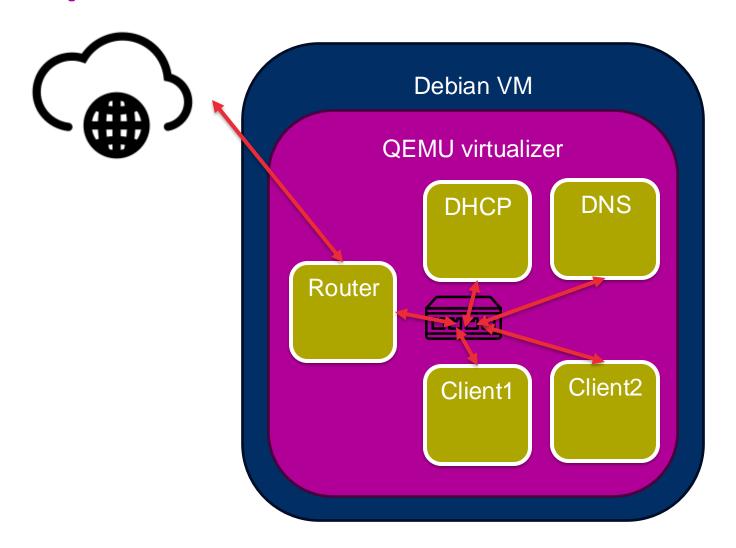| Command	Explanation
sudo virt-install	Installation of virtual machine. Extra parameters needed.
sudo virsh list --all	List all VMs.
sudo virsh start <my_vm>	Start a VM. Replace <my_vm> with the name of your VM.
sudo virsh shutdown <my_vm>	Shutdown a VM. Replace <my_vm> with the name of your VM.
sudo virsh destroy <my_vm>	Forcefully shutdown a VM. Replace <my_vm> with the name of your VM.
sudo virsh undefine <my_vm>	Delete a VM. Replace <my_vm> with the name of your VM.
sudo virsh console <my_vm>	Connect to VM console. Replace <my_vm> with the name of your VM.
Qwerty: "Ctrl +]" Azerty: "Ctrl + $"	Exit the console to go back to host.

Command list overview – Networks

Command	Explanation
sudo virsh net-define <network.xml>	Network definition. Replace <network.xml> with the correct filename.
sudo virsh net-start <name>	Start the network. Replace <name> with the network name defined in your config.
sudo virsh net-autostart <name>	Automatic startup of a virtual network. Replace <name> with the name of your network name.
sudo virsh domiflist <vm_name>	List all attached interfaces. Replace <vm_name> with your VM name.
sudo virsh attach-interface --type network --source <name> --model virtio <vm_name> --persistent	Attach a network interface to a VM. Replace <vm_name> with the name of the VM, and <name> with your network name.
sudo virsh detach-interface <vm_name> network <mac_address>	Detach a network interface from your VM. Replace <vm_name> with the name of the VM, and <mac_address> with the mac address retrieved using domiflist.

Current setup

Debian VM

QEMU virtualizer

DHCP

DNS

Router

Client1

Client2

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Remote access

Introduction - Remote access

ssh — OpenSSH SSH client (remote login program)

scp — secure copy (remote file copy program)

sftp — secure file transfer program

rsync — a fast, versatile, remote (and local) file-copying tool

Objectives - Remote access

- Using ssh, **remotely connect** to client 2, from client 1.
- Using ssh, **remotely connect** to the DNS server, from client 2, **without** using a **password**.
- **Copy a file** from client 1's home folder to client 2, using **(lookup the commands)**:
  - scp
  - sftp
  - rsync

Firewall rules

Objectives - Firewalls

Find out **which ports are necessary** for certain services to work:

- On the DNS server: named/dns service
- On the DHCP server: ports used by kea
- On all servers: ports used by the ssh protocol

Install iptables on all VMs

Using iptables:

- Only **allow incoming packets** for those ports/services.
- Make all iptables rules **persistent**!
- Setup **logging**

Tips

- Make sure that everything works correct before adding firewall rules
- Use "ping" to check one server can reach another
- Employ "nslookup" to check if your setup works correctly
  - Install dnsutils on all VMs