Network Administration HW1

zswu

Purposes

❑ Building an intranet with DHCP, NAT, VPN, DNS, LDAP, Mail, WWW… services

❑ Understanding and managing all these services
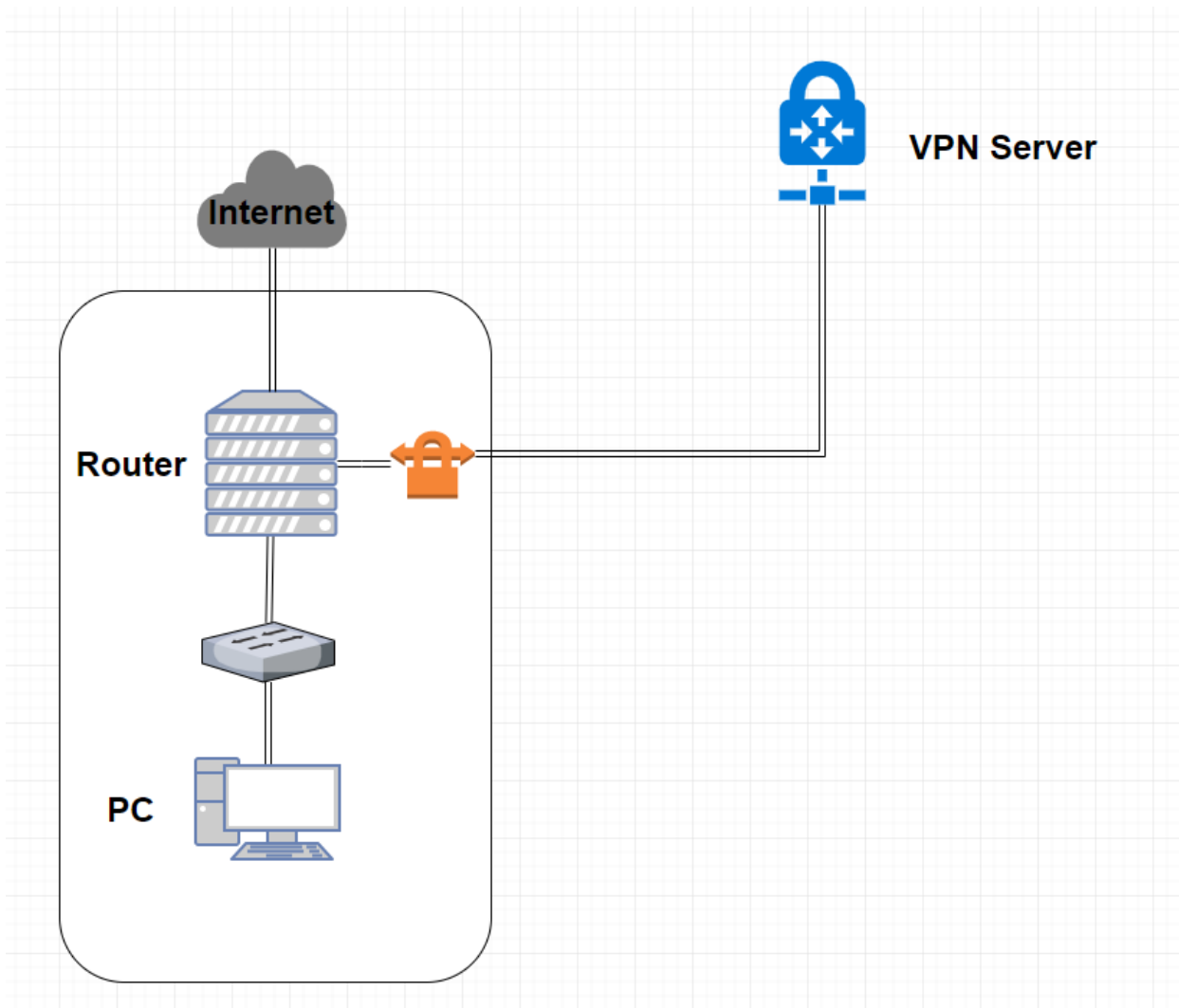
HW1 Overview

❑ One "Router"

- Provides NAT, DHCP, VPN
- Connecting your "ClientPC" to the outside world
- Connecting to VPN Server and transfer packets from/to TAs and classmates

❑ One "ClientPC"

- Simulate a simple PC inside the intranet
- Help you verify your results

NA Intranet Schematic Diagram

Requirements (1/4)

❑ "Router"

- You will be arranged a 10.113.x.0/24 subnet by TA for you to do your homework during this semester
  - ➢ Don't change your subnet by yourself! Your grade is based on the services in your subnet, and you may crash the whole intranet due to IP collision

- Router must have these three network interfaces
  - ➢ Public : To Internet
    - – Provides NAT on this interfaces, so the packets from the internal network can go to the outside world
  - ➢ Private : To the internal network
    - – Provides DHCP on this interfaces, with IP between 10.113.x.100 and 10.113.x.200
  - ➢ VPN : To VPN Server (navpn.nctucs.cc)
    - – Send the packets to this interfaces if it's target is 10.113.0.0/16

Requirements (2/4)

- About VPN
  - ➢ Use Wireguard (https://www.wireguard.com/)
  - ➢ You will get a pre-generate private key and the public key of server for you to connect to navpn.nctucs.cc:51820
  - ➢ You can create your own vpn peer so you can connect to your intranet from outside world
- About VM
  - ➢ We use Virtualbox by default. You can choose another VM engine or use VPS, but you must satisfy the requirements (Network interfaces, intranet, vpn…etc)
  - ➢ With Virtualbox network card settings, you can use "NAT" as the public interface, use "Internal Network" as the private interface
    - – Except "Router", all servers inside the internal network can only have one network interface connect to "Router", second interfaces on the servers is not allowed

Requirements (3/4)

- Routing and Firewall
  - ➢ You may need additional settings for the routing table
  - ➢ By default, all the packets from/to 10.113.0.0/16 are allowed
  - ➢ By default, the packets from Internet are denied, the packets to Internet are allowed
  - ➢ "Router" has two IP address
    - 10.113.0.x/16 on VPN interfaces
    - 10.113.x.254/24 on private interfaces
    - Address on public interfaces are not limited, but make sure it won't impact IPs of the intranet
- About OS
  - ➢ You can choose any UNIX-like OS, but make sure it supports all the feature we need
    - We use CentOS by default. Archlinux, Ubuntu and FreeBSD should be fine
  - ➢ You can choose different OS for each servers

Requirements (4/4)

❑ "ClientPC"

- This VM can help you debug and verify your results
- You can use any OS on this VM
  - ➢ We use Ubuntu by default
  - ➢ Linux, BSD, even Windows are allowed
  - ➢ GUI is suggested
- Connect to the network by default DHCP client
  - ➢ For example, if you use Ubuntu, the network should be connected without any additional configuration
- After all configuration, your "ClientPC" should be able to ping your classmates' "ClientPC"

DEMO

❑ TA will ping "Router" and "ClientPC"

- Ping 10.113.0.x and 10.113.x.254
- Ping the IP which "ClientPC" get from the DHCP server

❑ Due date: 2019/4/11 18:30

FAQ

❑ How to check NAT connectivity?

- Ping 8.8.8.8 from ClientPC

- Ping www.google.com from ClientPC

❑ How to check VPN work correctly?

- Ping 10.113.0.254 from Router/ClientPC

❑ How to check DHCP work correctly?

- $ ip addr or $ ifconfig

- Ping 10.113.x.254 (Router) from ClientPC

Help!

❑ Email to ta@nasa.cs.nctu.edu.tw
  - Don't send email by E3new

❑ EC 3F CSCC