Network Administration HW1

zswu

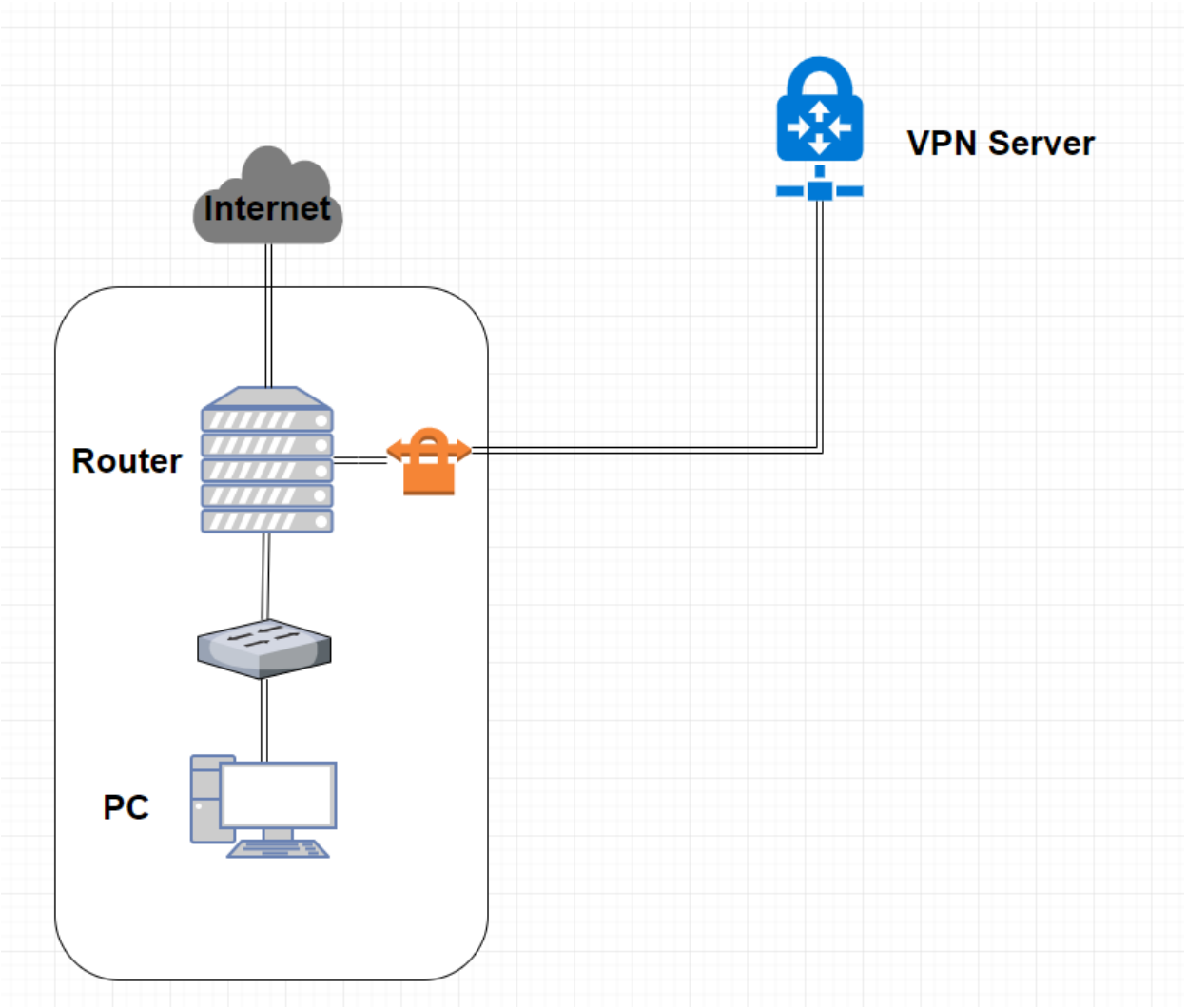
Purposes

- 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