Project 1. VM Networking

TA ytshih
Credit to clc

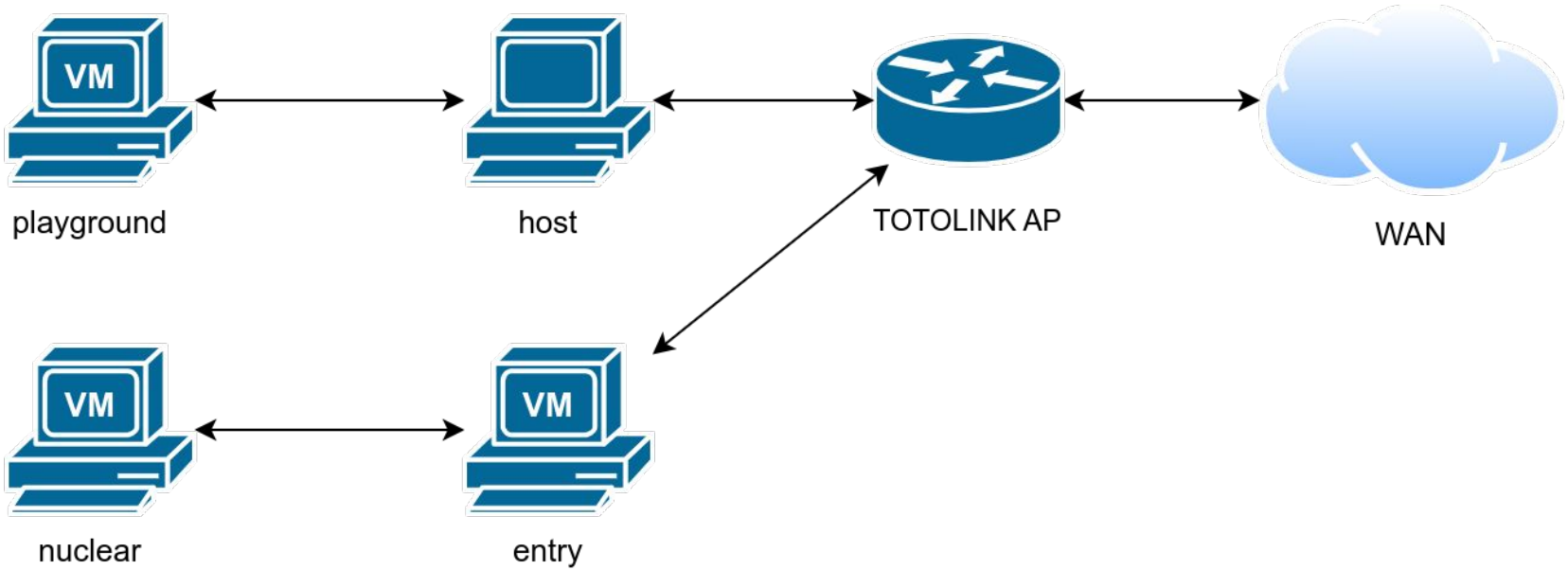
Purpose

- Learn how to use a AP(Access Point) that you can buy on the market.
- Learn how to create a VM environment which fits you demand.

TOTOLINK A3

- Wi-Fi AP / Router for home
- Ports: WAN x 1, LAN x 2
- Support NAT and Port Forwarding
- PPTP Tunnel with up to 5 users
- Data Sheet (PDF)

Topology



Spec - Basic

- Hard reset your AP before doing this project.
- You can use any UNIX-like OS for the VMs.
  - Arch, Debian, Ubuntu, FreeBSD, etc.
- For every VM:
  - Username / Password: ccna / ccna
  - SSH server should be started & enabled.

Spec - WAN

- Simulation of anyone outside the subnet of the AP.
- We will be using the network of classroom EC324 during demo.
- You can use the PCs in 24hr PC room (EC321).
    - See Appendix A. About 24h PC room (EC321).

Spec - AP

- Change the admin password to your student ID.
- Change SSID to “CCNA_<your student ID>”.
- Set WPA2 password for Wi-Fi.
- WAN: Static, 192.168.24.x/24 (We will tell you which to use on demo)
  - Feel free to use whatever IP you like when testing.
- LAN IP Address: 192.168.87.254/24
- PPTP VPN Server
  - Encryption: MPPE
  - Username / Password: ccna / <your student ID>
  - See Appendix B. Setup VPN Client in Windows

Note: You cannot connect to the VPN from the same LAN.

Spec - Host

- IP Address: DHCP, between 192.168.87.10/24 ~ 192.168.87.20/24
- Assume ssh server is not enabled.

Spec - VM (entry)

- Hostname: entry
- Interface 1
  - Bridged
  - DHCP, reserved to 192.168.87.5/24
- Interface 2
  - Internal network ‘internal’
  - 192.168.131.1/24
- VPN Server (optional)
  - You can install a VPN server on this machine instead if you found that the VPN server on the AP is not what you want.

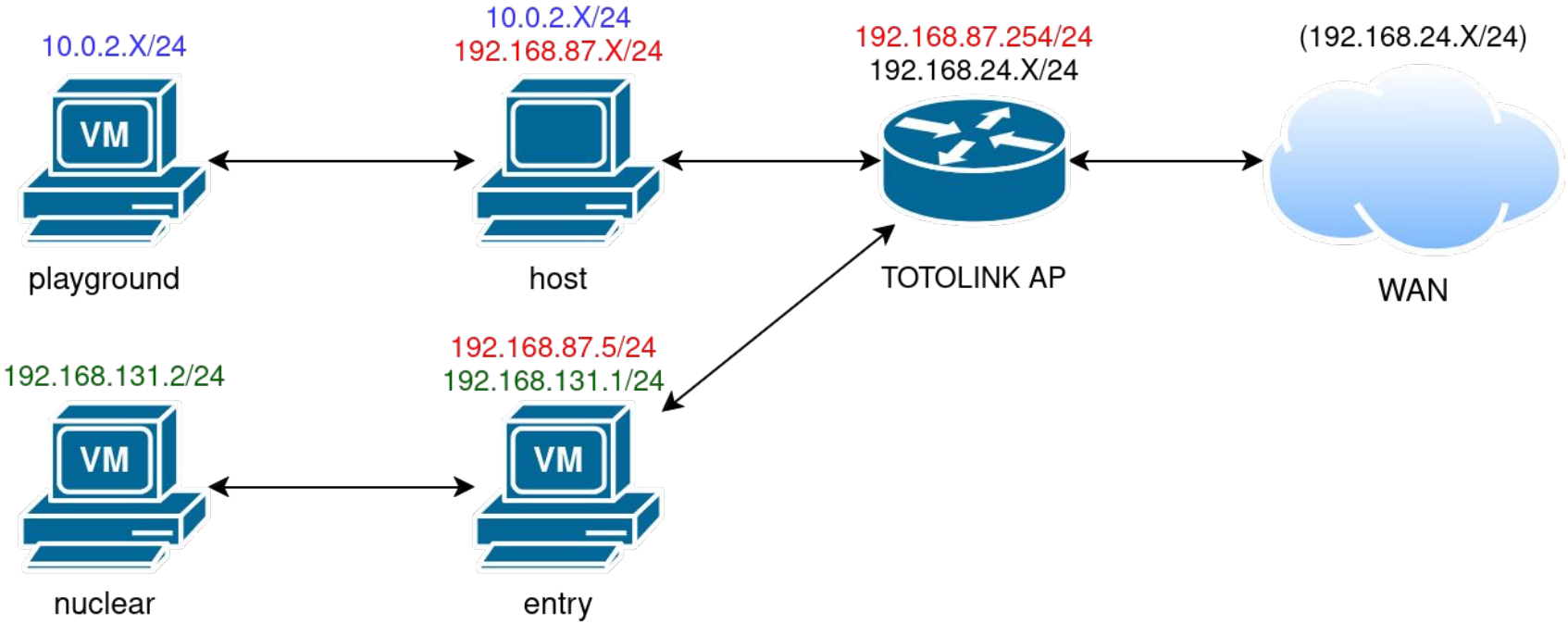
Spec - VM (playground)

- Hostname: playground
- Interface 1
  - NAT
  - Use the default IP

Spec - VM (nuclear)

- Hostname: nuclear
- Interface 1
  - Internal network ‘internal’
  - 192.168.131.2/24

IP Settings Overview



Requirement - WAN Connectivity

- host to WAN
- entry to WAN
- playground to WAN
- nuclear to WAN (bonus)
    - Hint: ip forwarding / masquerade

Requirement - SSH

- WAN to entry
  - By port forwarding
- host to playground
  - By port forwarding
- host to nuclear
  - By ssh proxy jump / ssh tunnel
- WAN to playground
  - By VPN + ssh tunnel
- WAN to nuclear (bonus)
  - By ssh tunnel + port forwarding

Grading

- Demo (60%)
  - Specs (25%)
  - Requirement - WAN Connectivity (15% + 5%)
  - Requirement - SSH (20% + 5%)
- Question (40%)
  - May include some of the contents in lectures or labs.

Demo Schedule

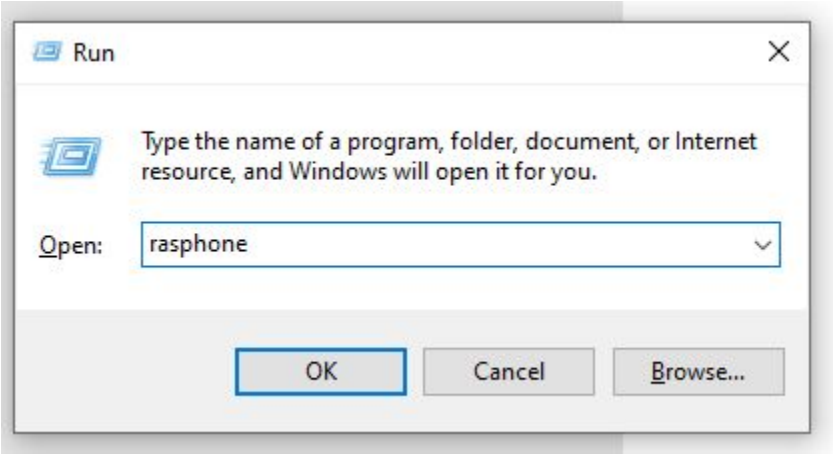
- Date: 03 / 22 (Fri.)
- Time: start from 19 : 00
- Duration: 15 mins for each student
  - You have to demonstrate the requirements and answer the questions within the time limit.
- Schedule: fill in the spreadsheet below
  - https://docs.google.com/spreadsheets/d/1j1bkSmIt2BrIT4HOKUZTflBmOcprOJrIrZV4faFCTGI/edit?usp=sharing

Appendix A. About 24h PC room (EC321)

- You can use the PCs at EC321 for testing.
- The environment there will be similar to the actual environment during demo.
  - Except the subnet will be slightly different.
- You can use the switch on the desktop.
- AP WAN Setting
  - IP Address: 192.168.21.x/24 (Use a number around 100 to avoid collision)
  - Gateway: 192.168.21.253
  - DNS: 140.113.1.1

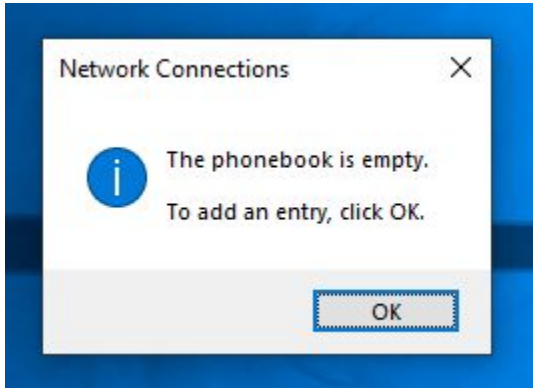
Appendix B. Setup VPN Client in Windows

- **Win + R** to open Run.
- Open **rasphone**.



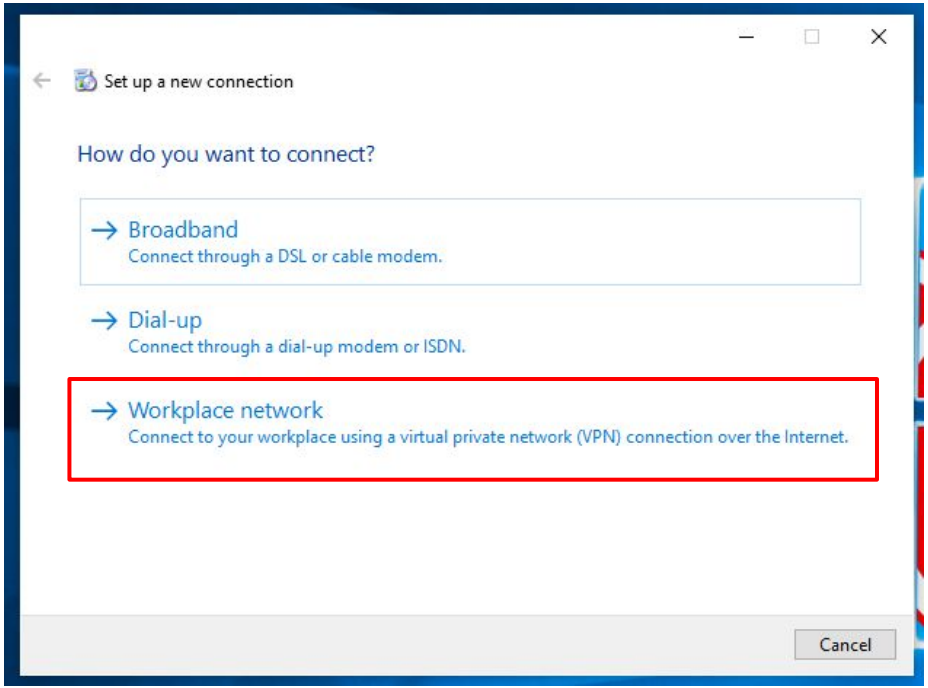
Appendix B. Setup VPN Client in Windows

- Click **OK**.



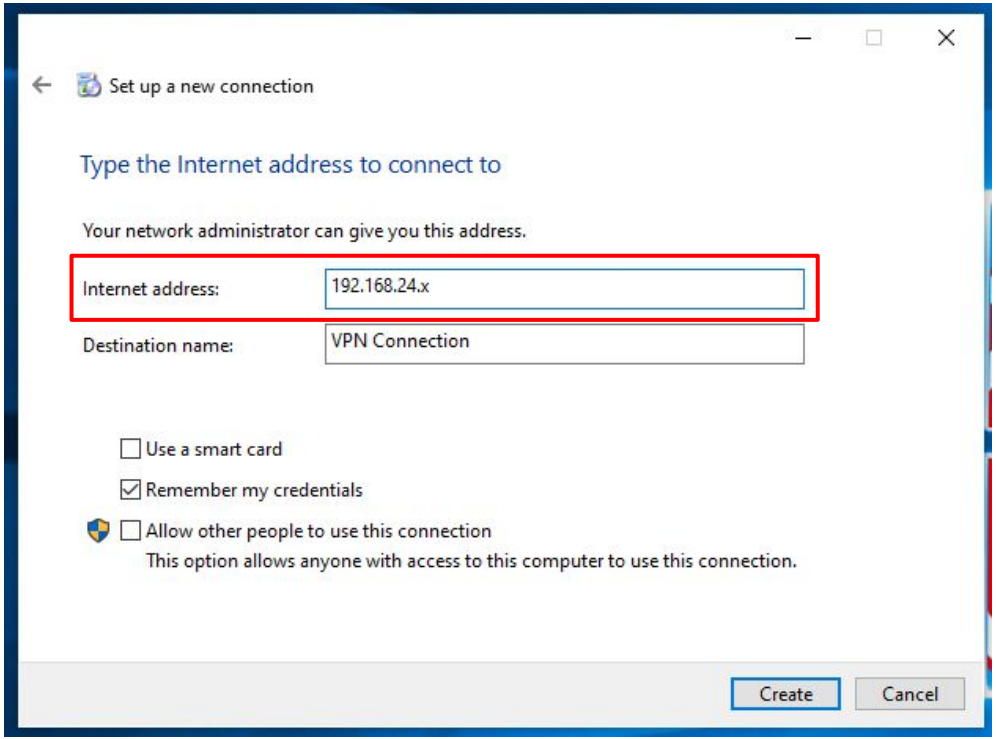
Appendix B. Setup VPN Client in Windows

- Choose **Workplace network**.



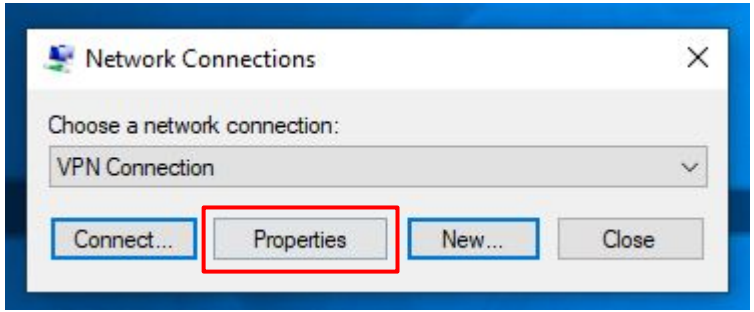
Appendix B. Setup VPN Client in Windows

- **Internet address**: The WAN IP address of your AP.



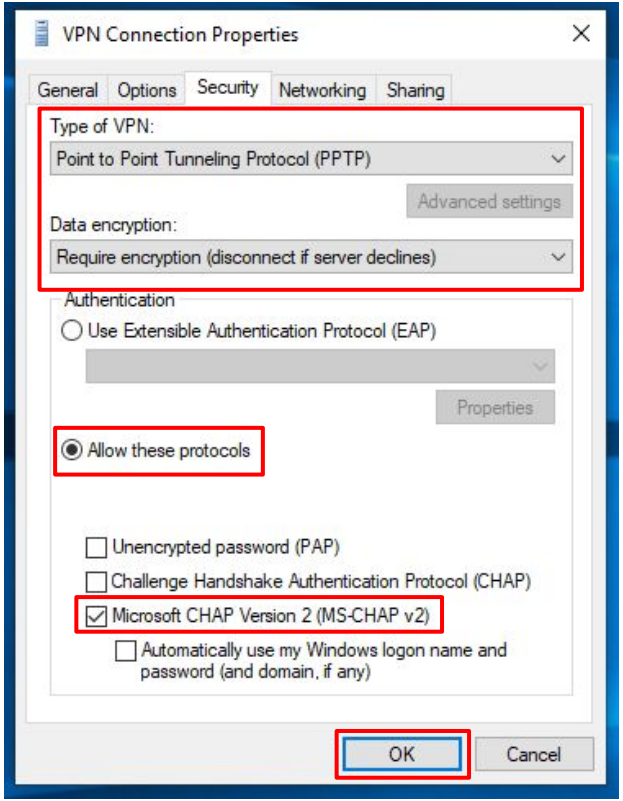
Appendix B. Setup VPN Client in Windows

- Click **Properties**.



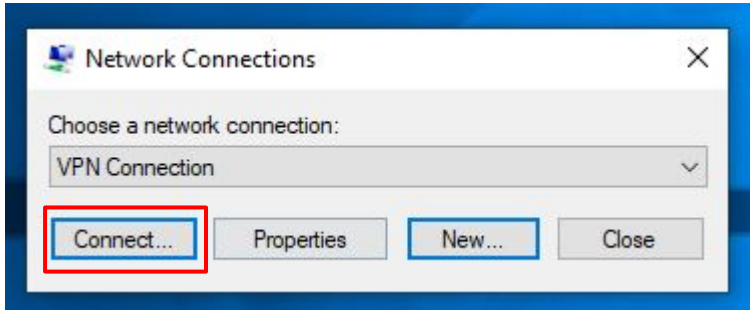
Appendix B. Setup VPN Client in Windows

- **Type of VPN**: PPTP
- **Data encryption**: Require
- Choose **Allow these protocols**.
- Check **Microsoft CHAP Version 2**.
- Click **OK**.



Appendix B. Setup VPN Client in Windows

- Click **Connect**.



Appendix B. Setup VPN Client in Windows

- Enter **User name** and **Password**.
- Click **Connect**.