CT 1406

NETWORK SECURITY LAB

1. ETHICAL ISSUES IN NETWORK SECURITY

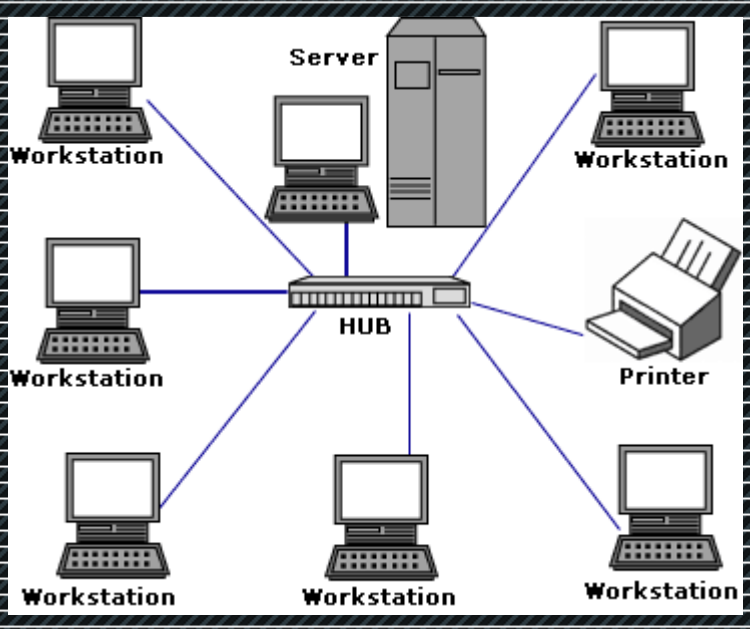
Coverage

Coverage

Coverage

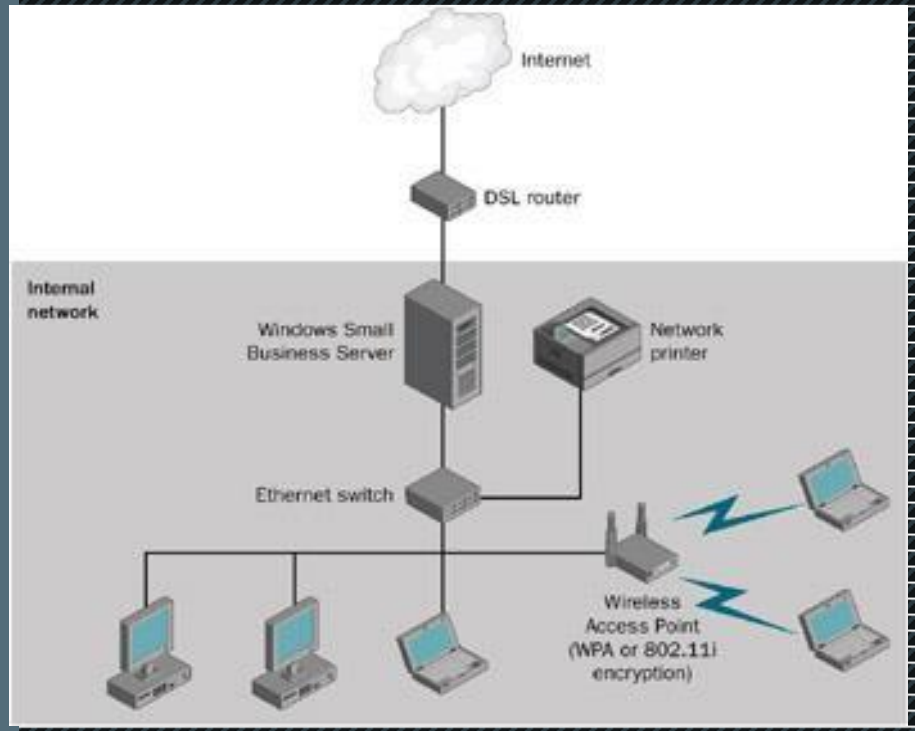
What is a Network?

- Group of computers interconnected.
- Sharing Resources
- Types of Networks:
  - LAN
    (Local Area Network)
  - MAN
    (Metro Area Network)
  - WAN
    (Wide Area Network)



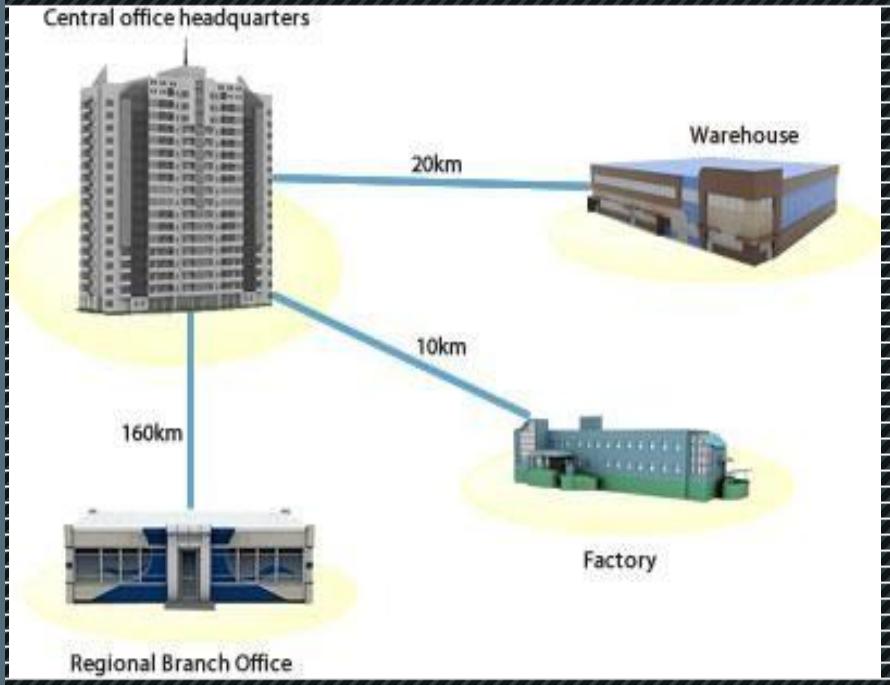
Local Area Network (LAN)

- Configured in a smaller Area ex: an office, Home, etc.,
- Peer-Peer Network
- Centralized Network
- Computer connected to switch/hub.
- Hub – Server
- Hub – Internet
- Hub – Server - Internet



Metro Area Network (MAN)

- Network Configured to interconnect offices in a city. Ex: Branches in a same city/state.
- Centralized Network
- Branches are connected through:
  - Telephone lines
  - Internet
  - Satellite



Wide Area Network (WAN)

- Network Configured to interconnect branches in a country or across countries.
- Centralized Network
- Connected through:
  - Satellites
  - Dedicated Leased Lines
- *Largest WAN : Internet*

Devices that make a Network

Computers

Switches

Wireless

Servers

Printers

Smartphones

Cables

Coverage

Network Security Issues/Threats

- Network security is prime most concern of all organizations.
- The information passed between Computers is very vulnerable.
- In the last decade there has been a massive increase of Hackers & Crackers creating:
  - Viruses
  - Ransomware
  - Other malicious threats

Security Threats

- The following is a list of commonly known security threats
- Viruses, Worms and Trojans
- SPAM
- Phishing
- Packet sniffing
- Malicious Websites
- Password Attacks
- Improperly secured wired/wireless networks

Viruses, Worms and Trojans

- **Virus:** A malicious program or code that **acts by attaching to a host program**, once loaded on to the computer and corrupts data and system services.
  - Ex: MyDoom, Sasser & Netsky, etc.,
- **Worms:** Similar to Virus, but doesn't need a host program to operate, it can operate on its own.
  - Ex: MSBlast!, Michelangelo, ILOVEYOU
- **Trojans:** A program disguised, contains harmful codes inside that may target data and file allocation table, thereby causing severe damage to computer.

SPAM and Phishing

- **SPAM:** Flooding a computer or a network with millions of copies of the same message. Affects the performance of the target by slowing down the network and results in Denial of Service (DOS)

- **Phishing:** Fraud emails disguised as legitimate communication to collect personal/financial information of targets.

Packet Sniffing – Malicious Sites

- **Packet Sniffer:**
  - A program that enables listening onto the network (eavesdropping).
  - Monitors the traffic on the network (packets).
  - Also capable of capturing the packets from network channel.
- **Malicious Sites:**
  - Websites that contain malicious codes and scripts.
  - Capable of capturing data from computers.

Password Attacks

- **Password Attacks:**
  - Used to determine the password of any user on a network.
  - Achieved through automatic tools.
    - Example: Brute force.
  - Once password is determined, the hacker can easily access all the personal information stored on the computer.

Open wire and wireless networks

- **Threats:**
  - Open networks are the most favorite entry points of hackers.
  - Shared data on open network can cause serious damages.
  - Nodes (computers) on open network can be used as botnets to forward the infections/malware deeper into network levels.

How to protect your networks?

Threats:

- Viruses, Worms & Trojans
- SPAM
- Phishing
- Packet Sniffers
- Malicious Sites
- Password Attacks

Countermeasures:

- Antiviruses, hardware and software IDS/IPS
- SPAM filters enable email services.
- Phishing filters enabled email and web browsing clients
- Obtain Strong Encryption technology.
- Obtain security suite to detect infected sites
- Strong Password policies throughout the network users

Protect your Network - II

- **Other measures include**
  - Updating Operating System with latest service packs.
  - Updating Antivirus/IDS/IPS software with latest databases of signatures.
  - Following network maintenance best practices such as:
    - Monitor access permissions regularly on network.
    - Devising a Security policy and strict adherence.
    - File Integrity Management (FIM) Solutions.
    - Keep up with existing and future threads.

REPORT WORK

- **Prepare a report on recent ransomware attacks : Wannacry and Petya:**
  - **What was the attack (type, source, point of origination)**
  - **What infection did it cause.**
  - **Countermeasures taken.**