Networking Devices

Table of Contents

- Common Network Connectivity Devices
- Other Specialized Devices

1 Common Network Connectivity Devices

Common Network Connectivity Devices
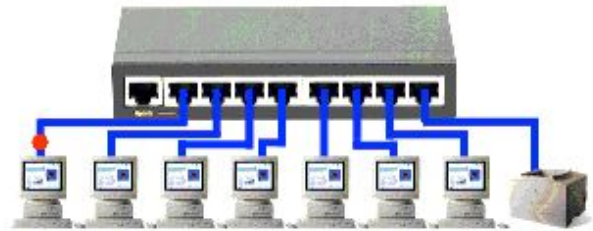
Network Interface Controller (NIC)

- A hardware that connects computers to a network

- Every NIC has a unique MAC address

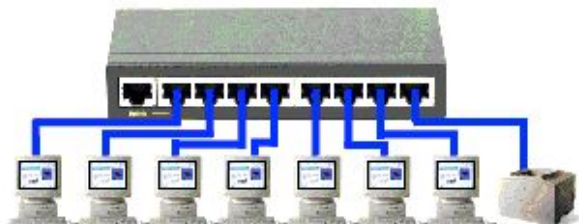# Common Network Connectivity Devices

Hub
- Broadcasts data to every computer connected to it
- Suitable for small LANs
- Not secure because all traffic can be captured
- No routing capability
- Creates a collision domain
- Half-duplex

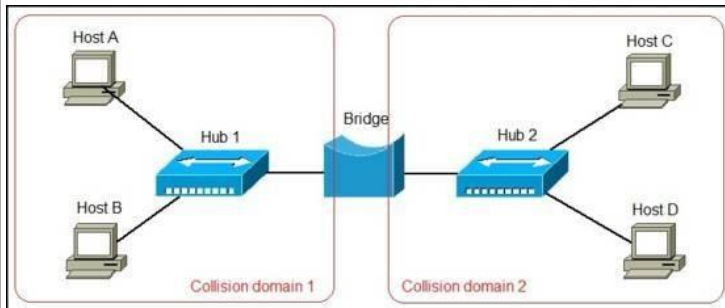# Common Network Connectivity Devices

Switch
- Connects multiple hosts together *(like Hub)*
- Works on Data Link Layer (Layer 2) *(unlike Hub)*
- Can inspect received traffic and forwards only to recipient(s) *(unlike Hub)*
- Each port on a Switch is a separate collision
- Full-duplex *(unlike Hub)*

Common Network Connectivity Devices
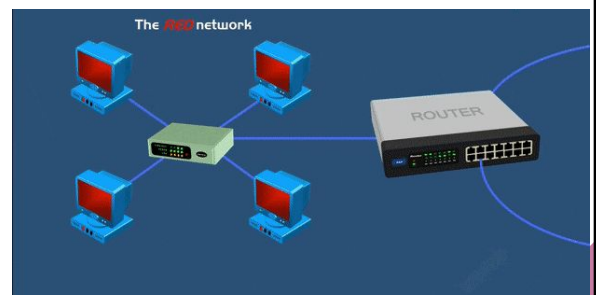
Bridge
- Divides a network into segments
- Works at Data Link Layer (Layer 2)
- Forwards or filters the Ethernet frames

Common Network Connectivity Devices

Router
- Connects multiple segments together
- Uses IP addresses to make decisions about the best way to get the data to its destination
- Works on Network Layer (Layer 3)
- Combination of hardware and software

Common Network Connectivity Devices

Firewall
- Prevents unauthorized access to or from a private network
- Protects a network's data and resources from outside access and threats
- Usually placed at the end point of a network
- Either a hardware (black box) or a software

black box =hardware firewall

en güvenlisi layer 7 deki new generation firewall

linux tabanl yazlmlar var

Common Network Connectivity Devices

gelimi güvenlik cihazlar temelde ayn ii yapar

IDS/IPS siberciler çok duyar
- Intrusion Detection System (IDS) monitors traffic and report malicious activities
- Intrusion Prevention System (IPS) stops threats in real-time as they occur

Intrusion Detection System (IDS)   **Intrusion Prevention System (IPS)**

ds= zararl bir ey görürse a yöneticisine haber veriyor

ps= bu sadece haber verme deil MÜDAHALE ediyor
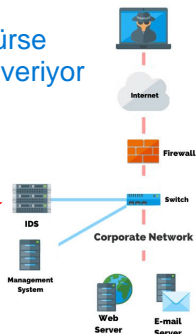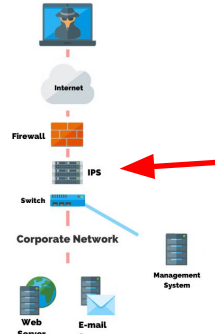
VS

Internet

Firewall

IDS   Switch

Corporate Network

Management System

Web Server   E-mail Server

Internet

Firewall

Switch   IPS

Corporate Network

Management System

Web Server   E-mail Server

2 ► Other Specialized Devices

AWS de çok kullanlacak servislerden biri bu
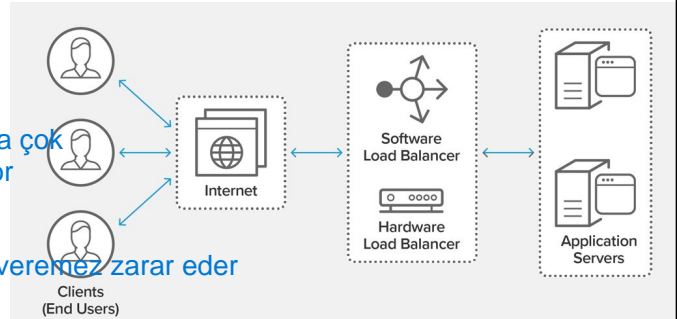
► Other Specialized Devices

Load Balancer   istek paketlerini eit olarak server lara detp yükü hafifletiyor

- Distributes client requests or network load efficiently across multiple servers
- Ensures high availability and reliability by sending requests only to servers that are online
- Provides the flexibility to add or subtract servers as demand dictates

mesela sn de 1000 kiiye hizmet veren bir server daha çok kiiye hizmet vermesi gerektiinde dier birini daha açyor ve ihtiyaç deilse kapatyor .AWS ci yapyor bunu

bunu yapmazsak siteler hizmet veremez zarar eder

Clients (End Users) → Internet → Software Load Balancer / Hardware Load Balancer → Application Servers

hemen ikinci üçüncü instence yada node u ayaa kaldryor

load balancer ite bu serverlar ayaa kaldryor ya da devre d brakr

Other Specialized Devices

Domain Name Service (DNS) Server

- Finds the IP addresses of hostnames
- Computers use IP addresses, humans use names
- Easier to remember www.clarusway.com than 13.35.253.82
- There are thousands of DNS servers
- Managed and controlled by *The Internet Assigned Numbers Authority (IANA)*
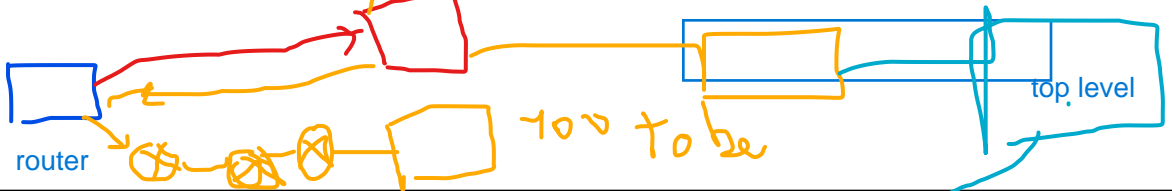- IANA is operated by *the Internet Corporation for Assigned Names and Numbers (ICANN)*

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13

Other Specialized Devices

Domain Name Service (DNS) Server

- **.com** A commercial organization
- **.edu** An educational establishment, such as a university
- **.gov** A branch of the U.S. government
- **.int** An international organization, such as NATO or the United Nations
- **.mil** A branch of the U.S. military
- **.net** A network organization
- **.org** A nonprofit organization
- Some DNS names end with country name like:
  .jp (Japan)   **.ca** (Canada)   **.uk** (Great Britain)

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14

Other Specialized Devices

Proxy Server
a cihazlarndan bu bir bilgisayar aslnda flitreleme yapar firewall mantnda mesela i bilgisayrlarndan facebooka girdirmez

- Acts as a gateway between you and the internet
- Acts as a firewall and web filter
- Provides shared network connections
- Caches data to speed up common requests
- Provides privacy

hz için de kullanlr mesela irketin en çok kulland serverlar burada cach olarak tutulr buradan hzlca balanr

privacy salar çünkü i yerinde önce proxy servera balanp kullanc ad girip login olur sonra internet çk yapar bunun bilgisi kullanc ad hepsi proxy sercer da tutuluyor

YOU   PROXY SERVER   INTERNET
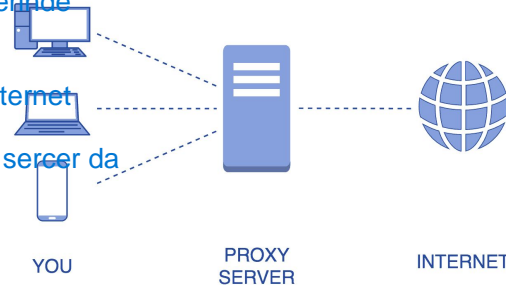
Other Specialized Devices

ifreleme yapan cihazlar
Encryption Devices
bunlarda hem yazlm hem donanm yada ikisi bir arada kullanlr

- Allows you to create secure connections over insecure channels
- Sometimes called *encryption gateway*

Other Specialized Devices

Packet Shaping (Traffic Shaping)

bandwith genilii yetmeyip mesela patron voip telefon balanamyor ite ona daha fazla band genilii yani öncelik veriyor

- Traffic shaping *(or packet shaping)* is a congestion management method that regulates network data transfer by delaying the flow of less important or less desired packets.
- Used to optimize network performance by prioritizing certain traffic flows and ensuring the traffic rate doesn't exceed the bandwidth limit.

ISP kota takibi bununla yapar
hz limitleme yapar
kotay anca hz düüren cihaz
budur.

ISP nin back bonu
üzerinde daha geni
imkan da salayabilir

Other Specialized Devices

Packet Shaping (Traffic Shaping)

Common uses of traffic shaping include:

- Time-sensitive data may be given priority over traffic that can be delayed briefly
- In a corporate environment, business-related traffic may be given priority over other traffic
- A large ISP may shape traffic based on customer priority
- An ISP may limit maximum bandwidth consumption for certain applications to reduce costs and create the capacity to take on additional subscribers

Other Specialized Devices

VPN Concentrator bu da hem yazlmsal hem donanmsal kullanlan bir cihaz
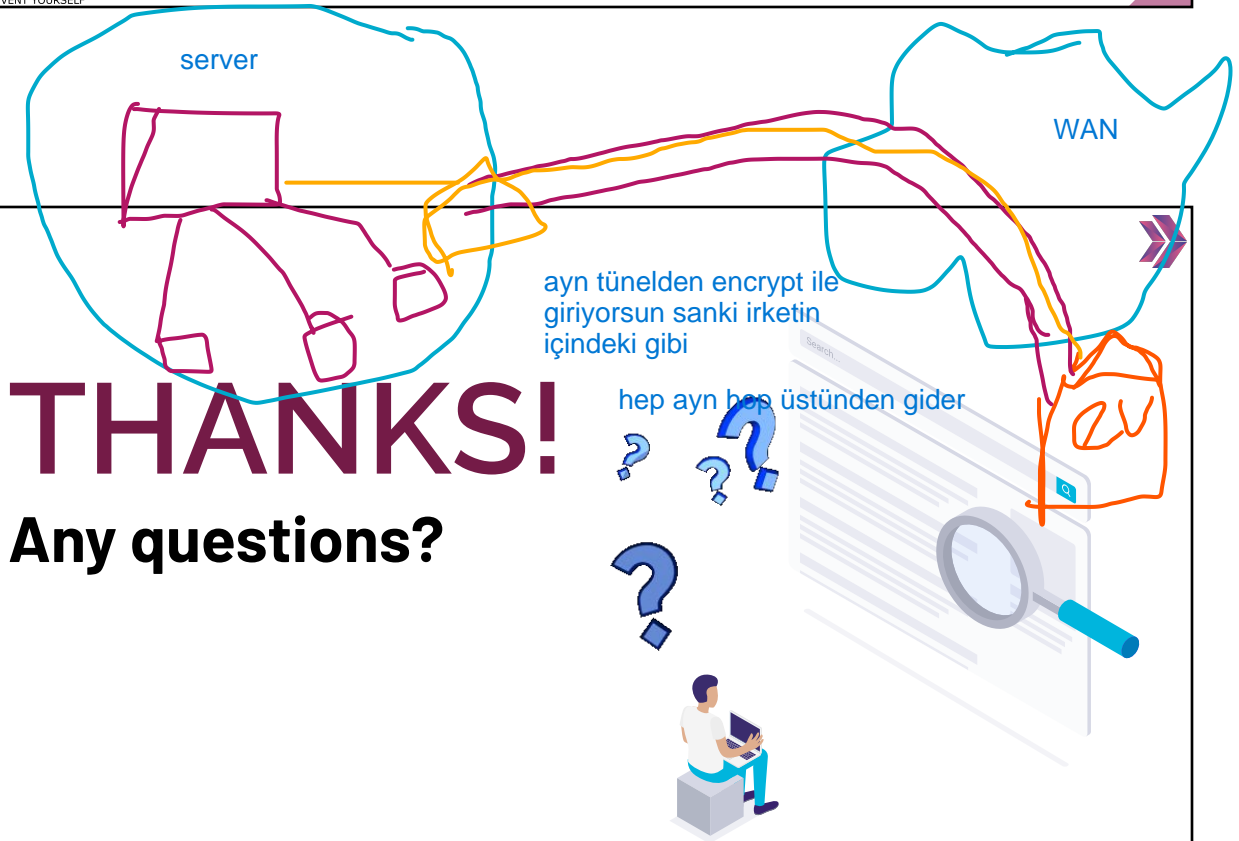
- Provides secure creation of VPN connections
- A type of router device   amac:
- It can:
    - Establish and configure tunnels
    - Authenticate users
    - Assign tunnel/IP addresses to users
    - Encrypt and decrypt data
    - Ensure end-to-end delivery of data

server

WAN

ayn tünelden encrypt ile giriyorsun sanki irketin içindeki gibi

THANKS!

hep ayn hep üstünden gider

Any questions?