1. Introduction, Network Edge

08 January 2025 08:39

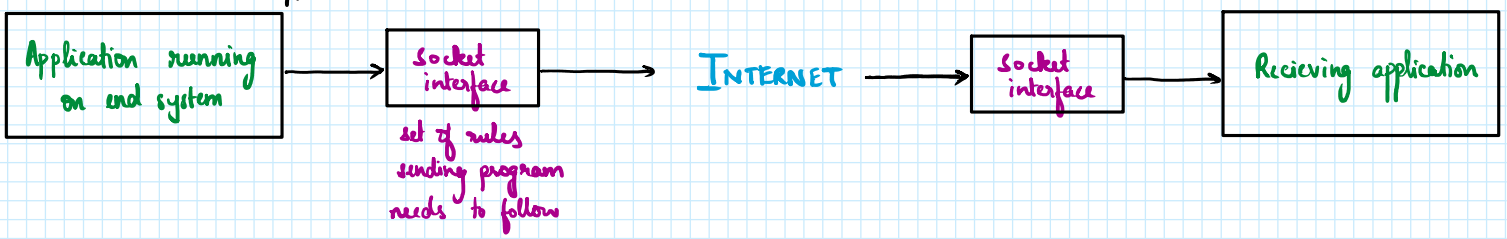
Nut and Bolt View

A "Service" View

Internet = infrastructure that provides services to applications

- Provides programming interface to distributed applications
  - Apps that are distributed between systems communicate via the Internet

How an internet application works



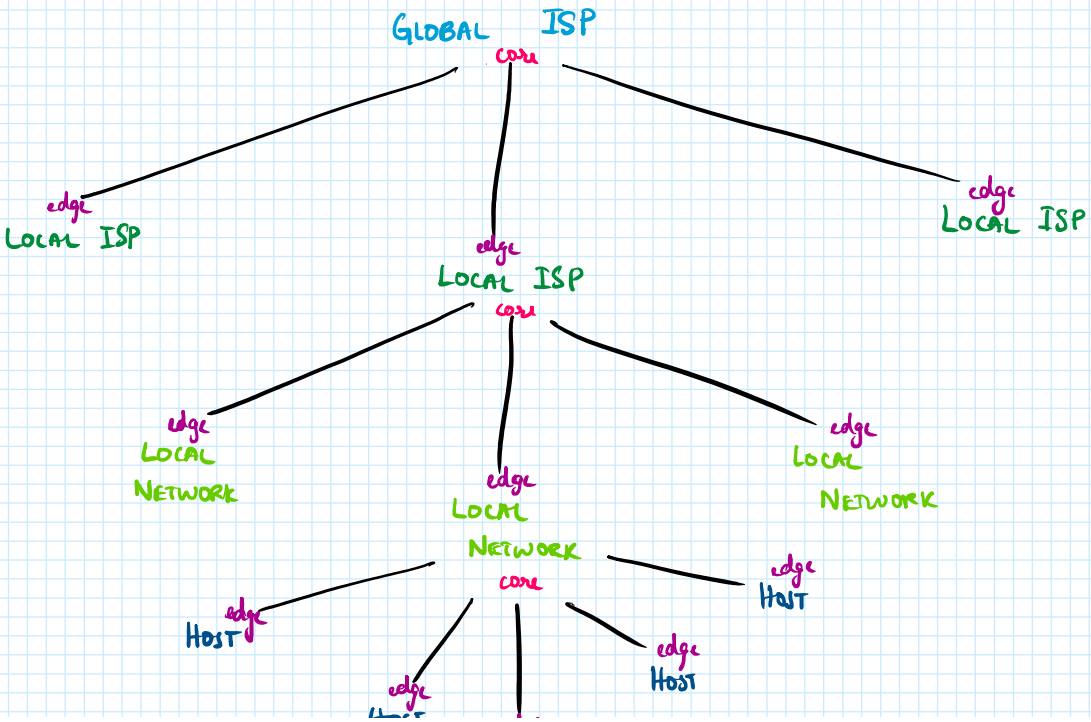
Protocols

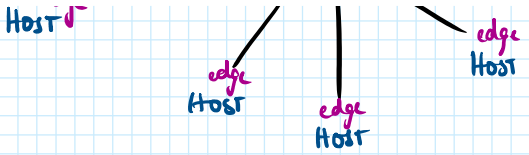
Define format, order of messages sent/received among network entities

as well as

actions taken on transmission, receipt

Network Edge





Network edge

- Hosts → clients
  servers
  ⇓
  stored in data centres

Edge network?

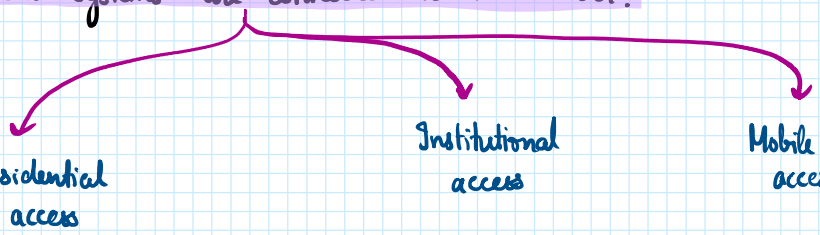
Access networks, physical media

Communication media, physical links

Network core

Packet switchers; network of networks

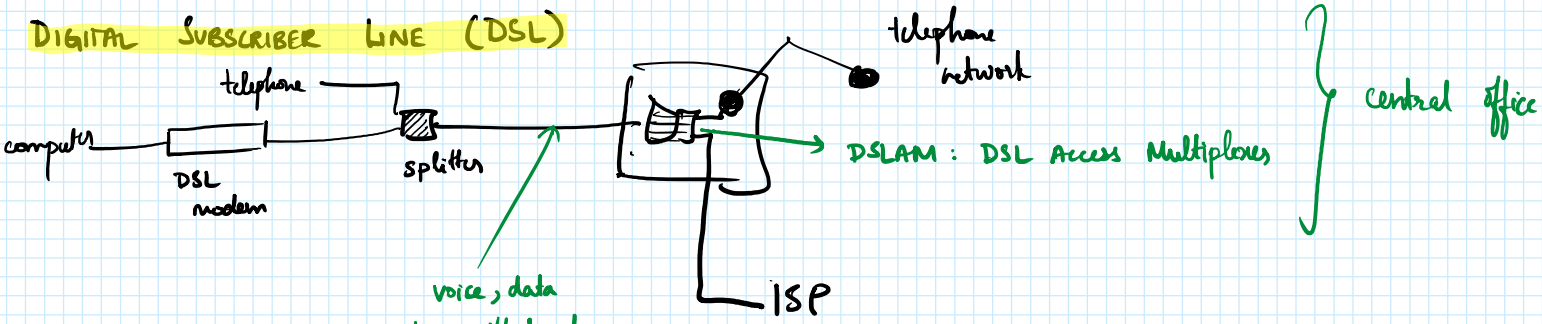
How end systems are connected to the router?



Two factors to check:
- Transmission speed
- User access: shared / dedicated

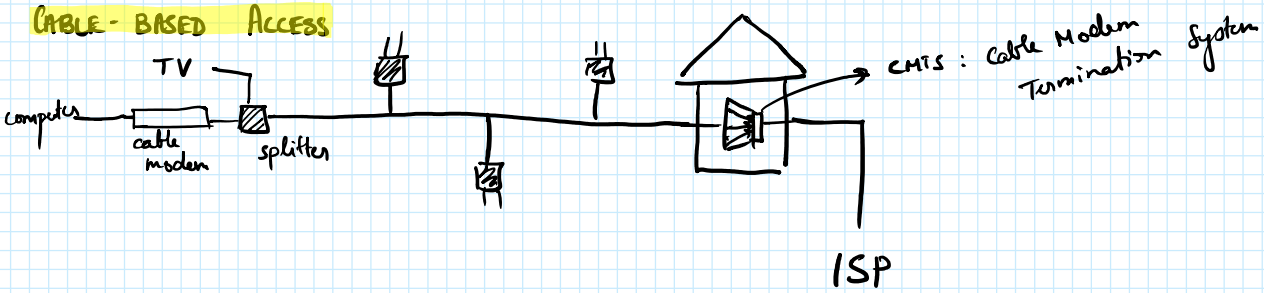
ACCESS NETWORKS

DIGITAL SUBSCRIBER LINE (DSL)



- Use existing telephone line to central office DSLAM
- Voice → tel net
  Data → ISP
- High speed downstream channel - 50 kHz to 1 MHz band - 16 to 24 Mbps
- Medium speed upstream channel - 4 kHz to 50 kHz - 3.5 to 16 Mbps
- Regular telephone line - 0 kHz to 4 kHz

CABLE-BASED ACCESS



- Uses FDM to send information in multiple channels across single coaxial cable
- Uses same network as television as proxy

HFC : Hybrid Fibre Coaxial cable

Downstream : 40 Mbps to 1.2 Gbps

Upstream : 30 to 100 Mbps

- Homes share access network