CSCI 446 Introduction to Computer Networks

Zhaohong Wang

Department of EECE

California State University, Chico

Topic

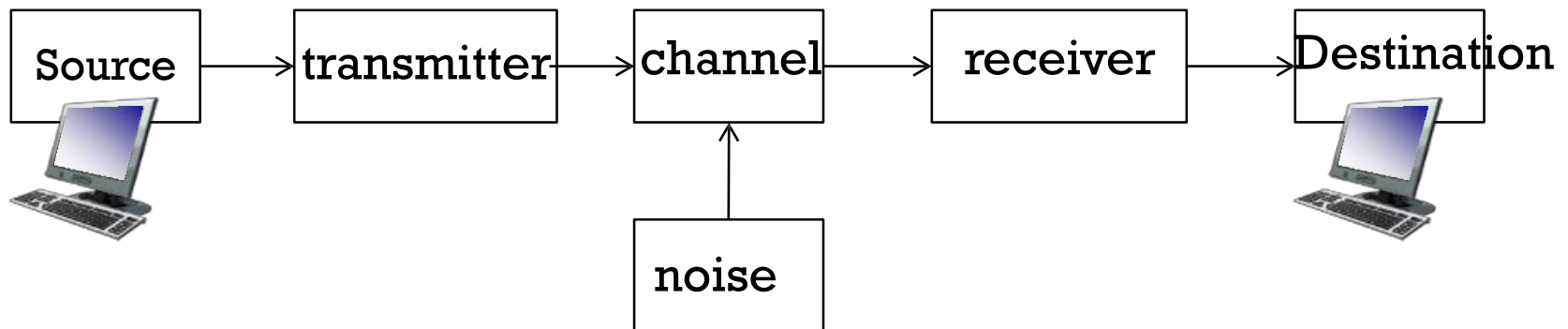**What is computer network?**

❖ Computer network is the product of close integration of communication technology and computer technology

❖ A model of communication:

| Source | → | transmitter | → | channel | → | receiver | → | Destination |

noise → channel

❖ Computer network is a kind of communication network.
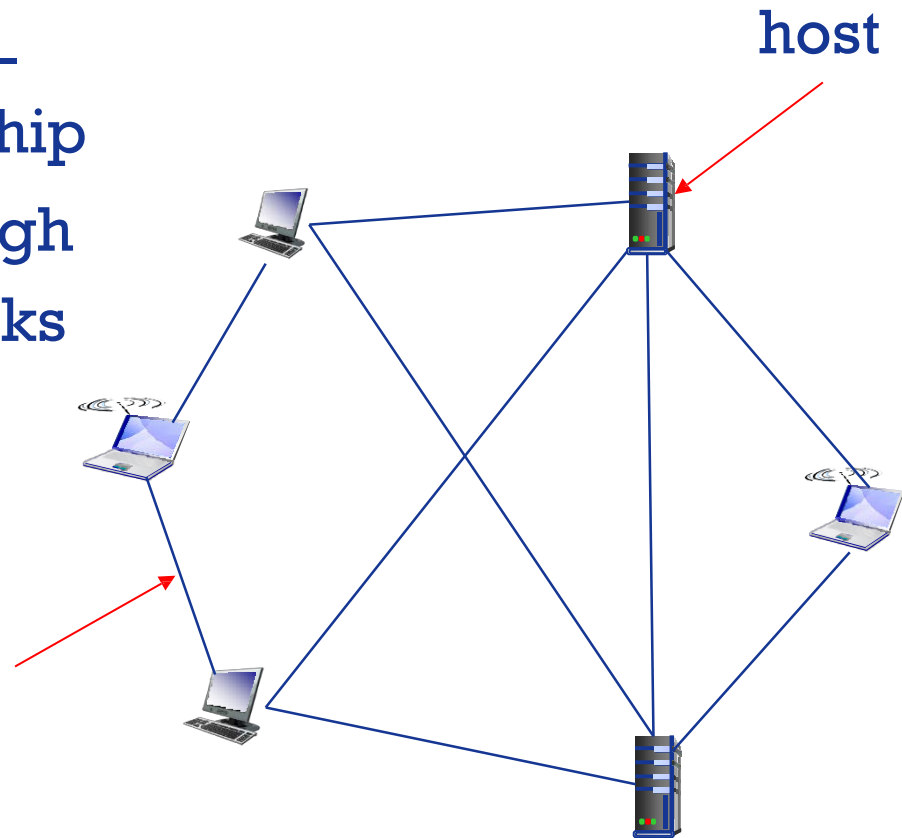
What is computer network?

❖ Definition: A computer network is a collection of **interconnected** and **autonomous** computers.

❖ **Autonomy**: no control-subordinate relationship

❖ **interconnected**: through
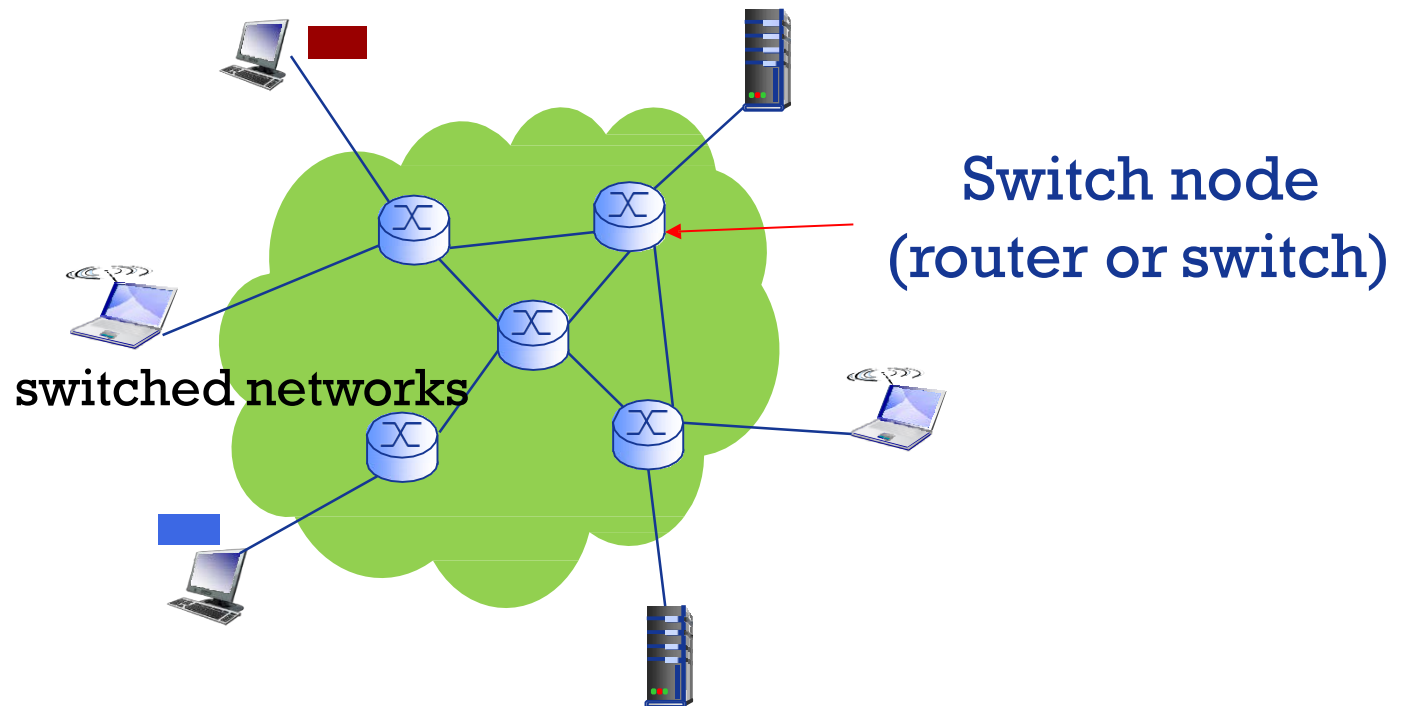- communication links

host

communication link

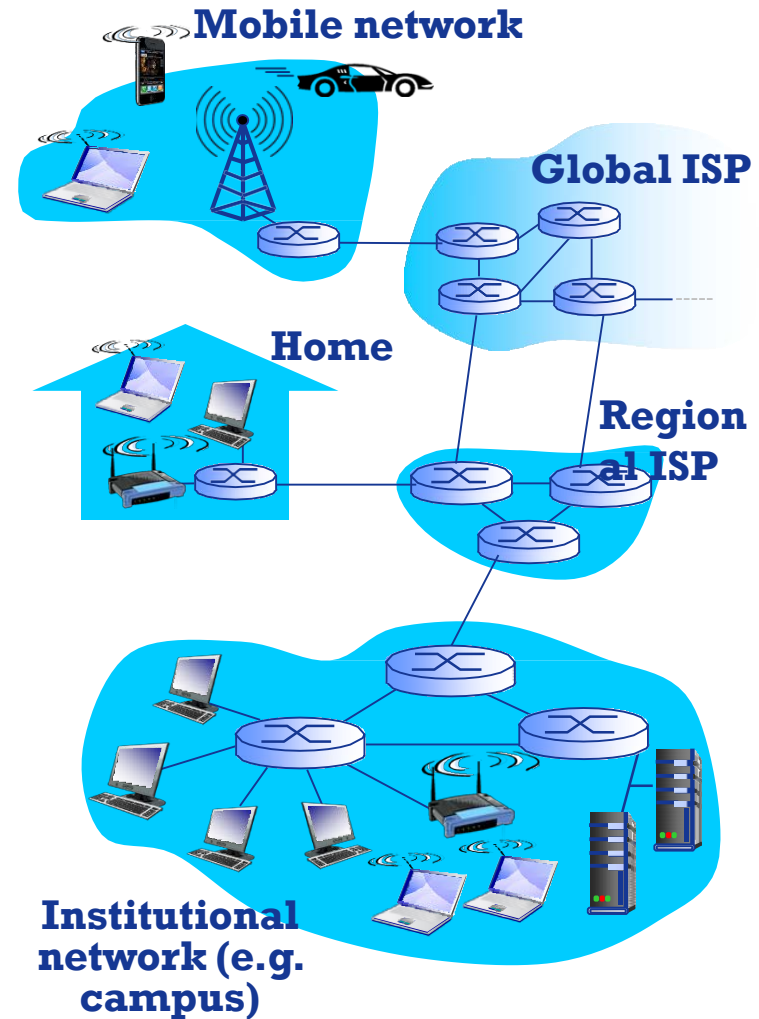❖ How to ensure interconnection in long distance and large quantity?

Computer Network

❖ Interconnect hosts through switched networks.

Switch node
(router or switch)

switched networks

What is Internet and its components?

❖ **The world's largest interconnected networks.**

- ISP (Internet Service Provider) connects with other networks – a network of networks.

Mobile network

Global ISP

Home

Regional ISP

Institutional network (e.g. campus)

What is Internet and its components?

❖ The world's largest interconnected networks.
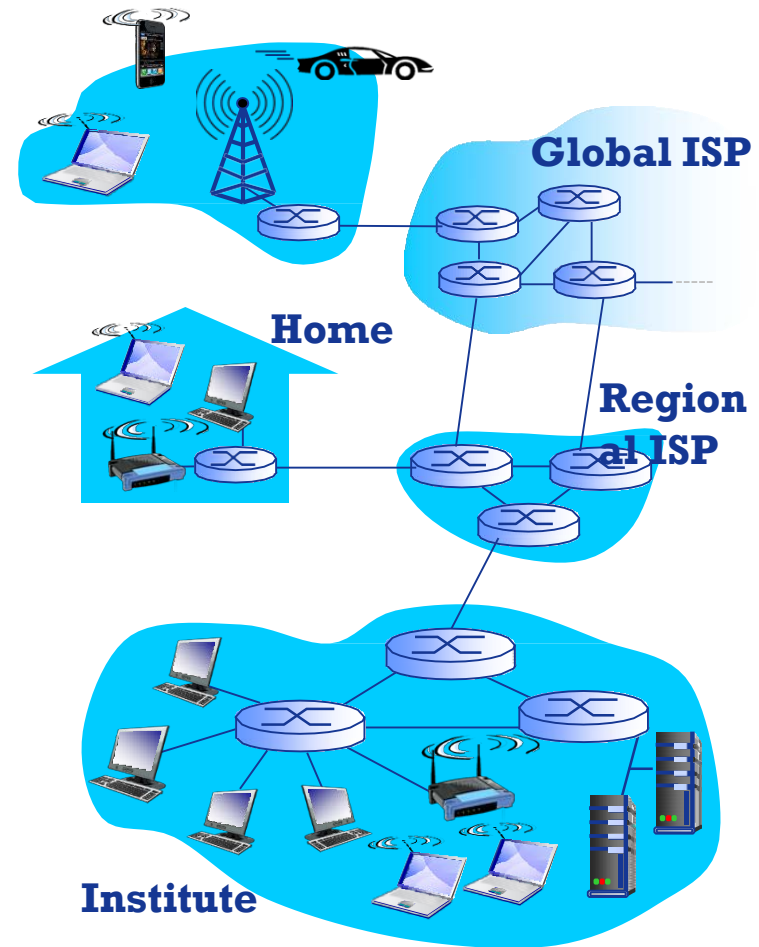- ISP (Internet Service Provider) connects with other networks - a network of networks.

PC

server

WiFi laptop

smartphone

wireless link

_____ **wired link**

router

❖ A collection of millions of interconnected computing devices:

- ▪ hosts=end systems
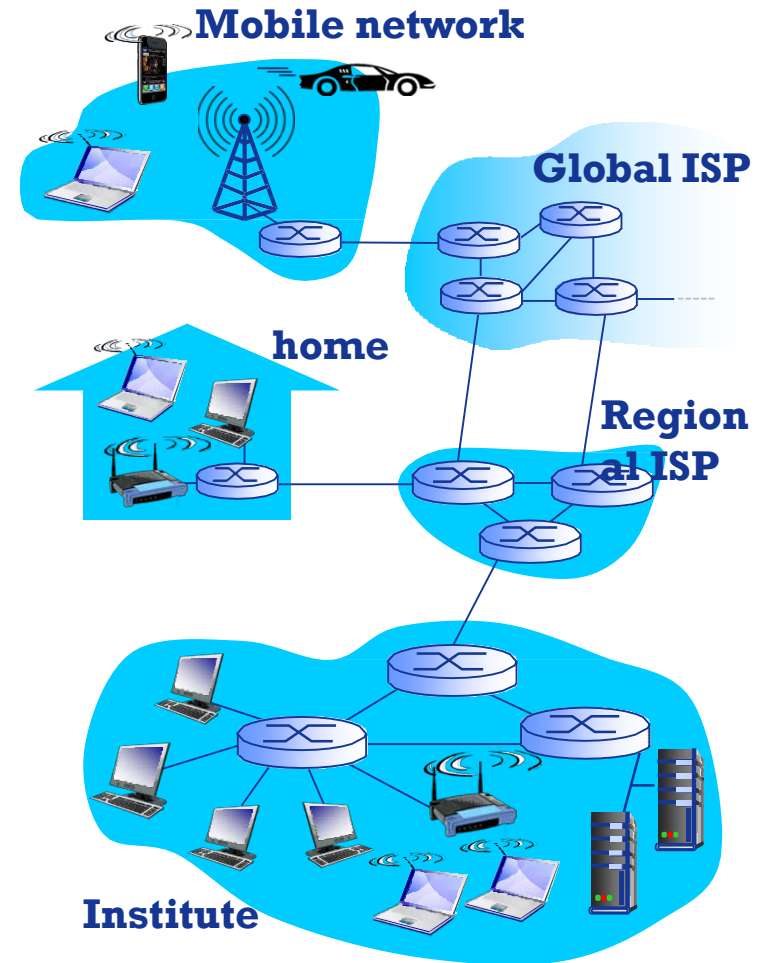
- ▪ running applications

❖ **communication links**
- ▪ Optical fiber, copper cable, radio, satellite ...

❖ Packet switching: forwarding packets (data packets)
- ▪ routers and switches

Global ISP

Home

Regional ISP

Institute

What is Internet and its services?

- infrastructure that provides services to applications:
  --Web, VoI P, email, games, e-commerce, social nets, …
- provides programming interface to apps
  --hooks that allow sending and receiving app programs to "connect" to Internet
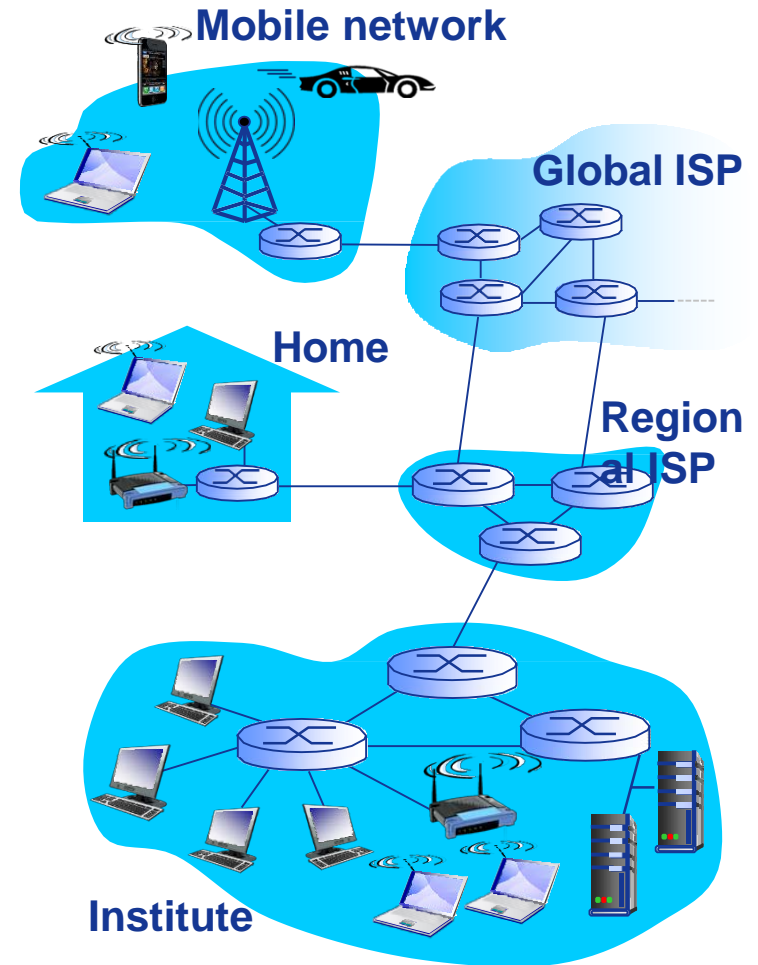 --provides service options, analogous to postal service

Mobile network

Global ISP

home

Region al ISP

Institute

Question

❖ Q： With only hardware (hosts, communication link, routers, …) connected together, can Internet function smoothly? Can it ensure that data is handled for applications correctly?

❖ Answer： No！

❖ We need protocols!

Mobile network

Global ISP

Home

Regional ISP

Institute

Thank you!