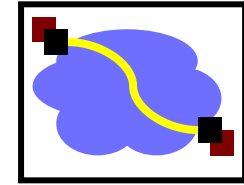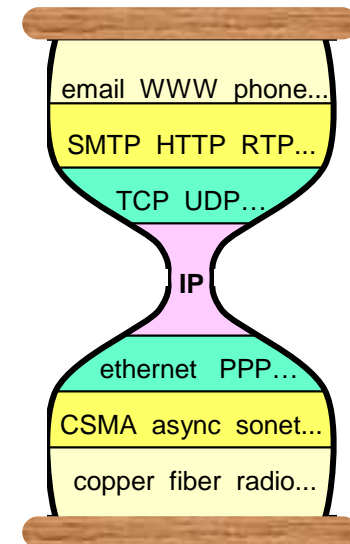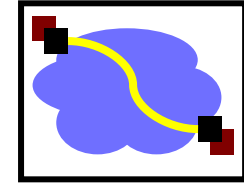# Internet Protocol (IP)

- Hour Glass Model
  - Create abstraction layer that hides underlying technology from network application software
  - Make as minimal as possible
  - Allows range of current & future technologies
  - Can support many different types of applications

Network applications

email WWW phone...

SMTP HTTP RTP...

TCP UDP...

IP

ethernet PPP...

CSMA async sonet...

copper fiber radio...

Network technology

What is an Internetwork?

- Multiple incompatible LANs can be physically connected by specialized computers called *routers*
- The connected networks are called an *internetwork*
  - The "*Internet*" is one (very big & successful) example of an internetwork
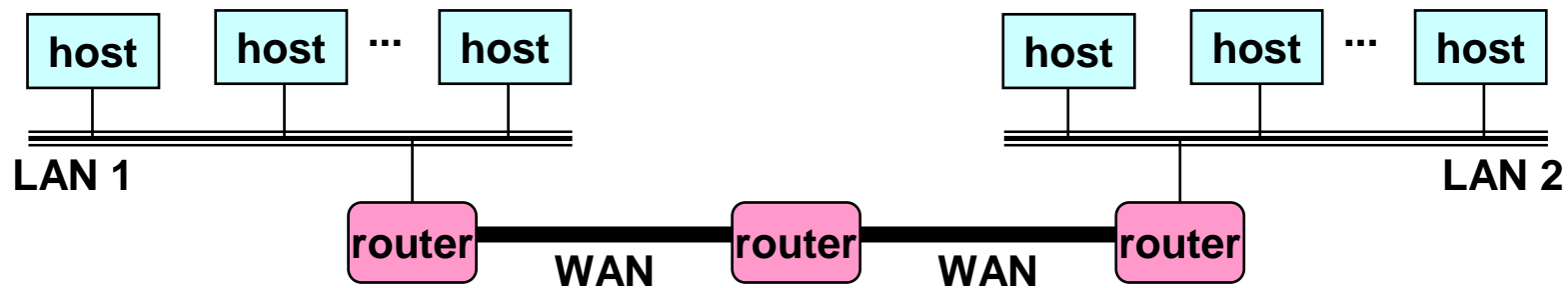
LAN 1 and LAN 2 might be completely different, totally incompatible LANs (e.g., Ethernet and ATM)

Designing an Internetwork
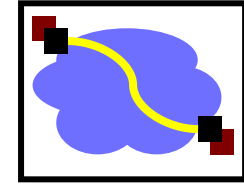
- How do I designate a distant host?
  - Addressing / naming
- How do I send information to a distant host?
  - Underlying service model
    - What gets sent?
    - How fast will it go?
    - What happens if it doesn't get there?
  - Routing
- Challenges
  - Heterogeneity
    - Assembly from variety of different networks
  - Scalability
    - Ensure ability to grow to worldwide scale