

# Computer Networks and Internets

《计算机网络与因特网》课件

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# **PART IV Internetworking**

## **Chapter 20 (1)**

### **Internetworking: Concepts, Architecture, and Protocols**

网络互联：概念、结构与协议

## **20.2 The Motivation for Internetworking**

- **Each network technology is designed to fit a specific set of constraints.**
- **LAN technologies(e.g., Ethernet).**
- **WAN technologies (e.g., Frame Relay).**
- **No single networking technology is best for all needs.**
- **A large organization with diverse networking requirements needs multiple physical networks.**

## 20.3 The Concept of Universal Service通用服务概念

- A computer attached to a given network can only communicate with other computers attached to the same network.
- Each network in the organization formed an island.
- Users must use a separate computer for each network.
- Universal service(通用服务) allows arbitrary pairs of computers to communicate.

## **20.4 Universal Service In A Heterogeneous World**

### **异构世界中的通用服务**

- **Electrical incompatibilities among network hardware.**
- **Different technologies use incompatible packet formats and addressing scheme.**
- **A frame created for one network technology cannot be transmitted on a network that uses a different technology.**

## 20.5 Internetworking

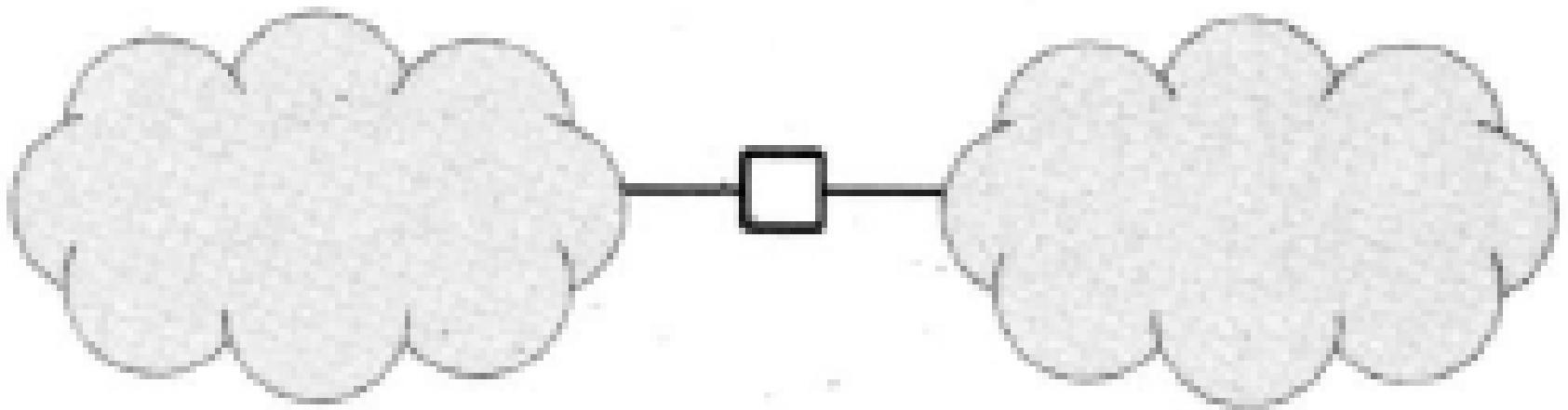
- Called internetworking, the scheme uses both hardware and software.
- Additional hardware systems are used to interconnect a set of physical network.
- Software on all the attached computers then provides universal service.
- The resulting system of connected physical networks is known as an internetwork or internet.



## 20.6 Physical Network Connection With Routers

### 用路由器连接物理网

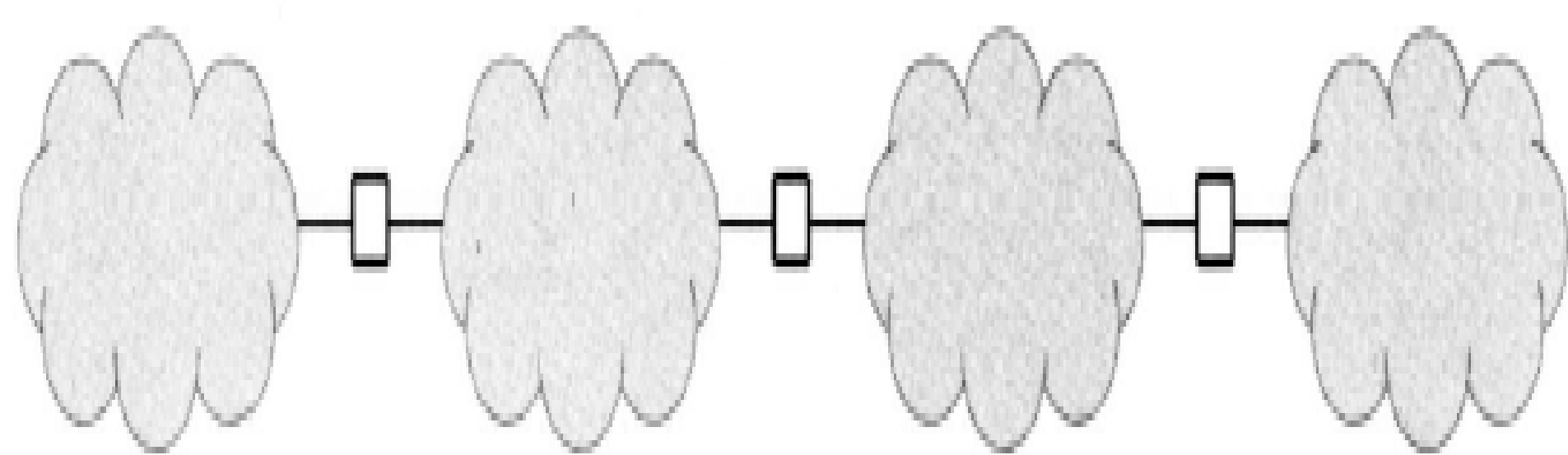
- The basic hardware component used to connect heterogeneous network is a router .



## 20.7 Internet Architecture

### 互联网体系结构

- A internet consists of a set of networks interconnected by routers .



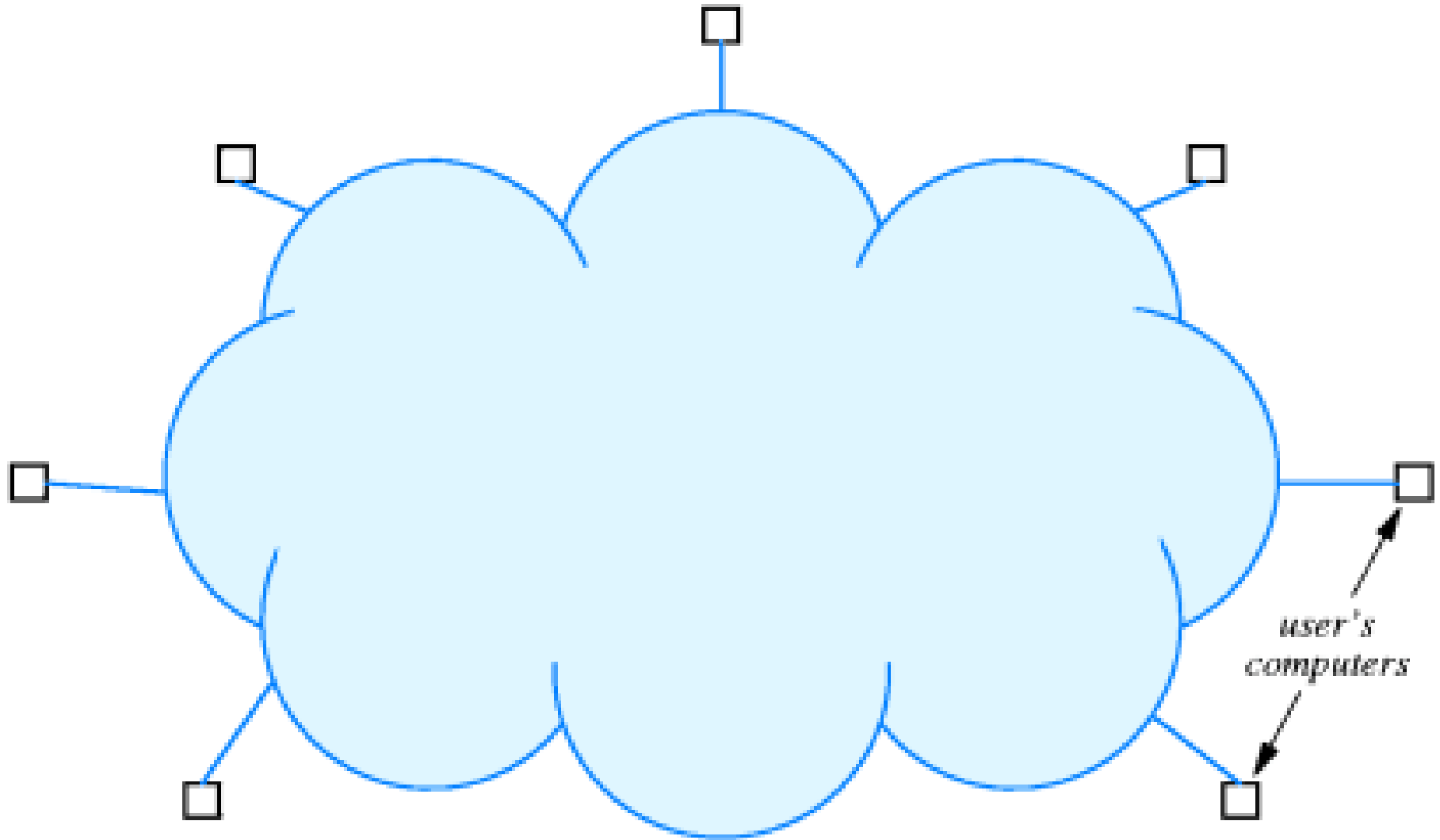


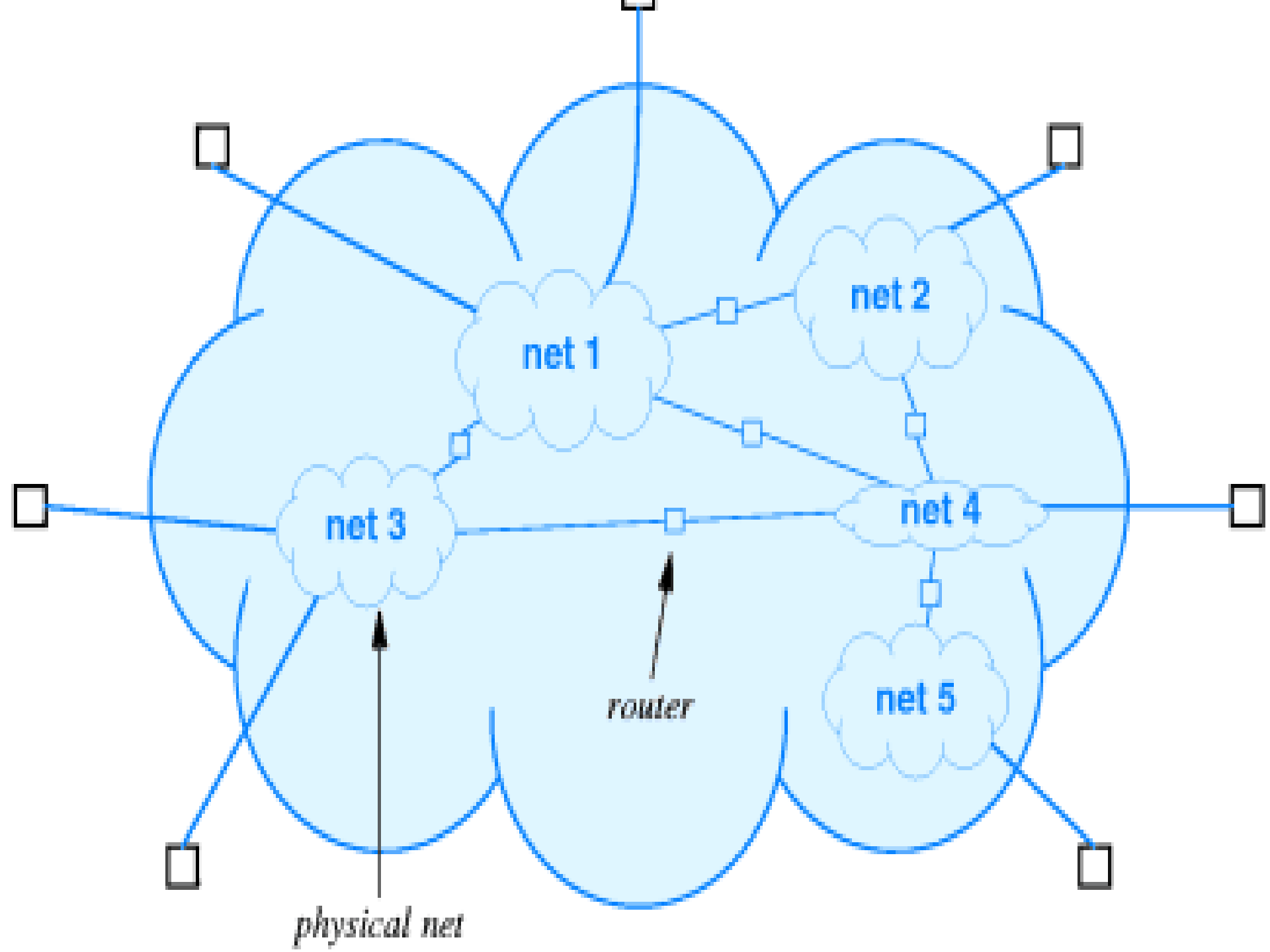
## 20.8 Achieving Universal service

- To provide universal service among all computers on an internet,
- Routers must agree to forward information from a source on one network to a specified destination on another.

## 20.9 A Virtual Network 虚拟网络

■ an internet is a virtual network system.



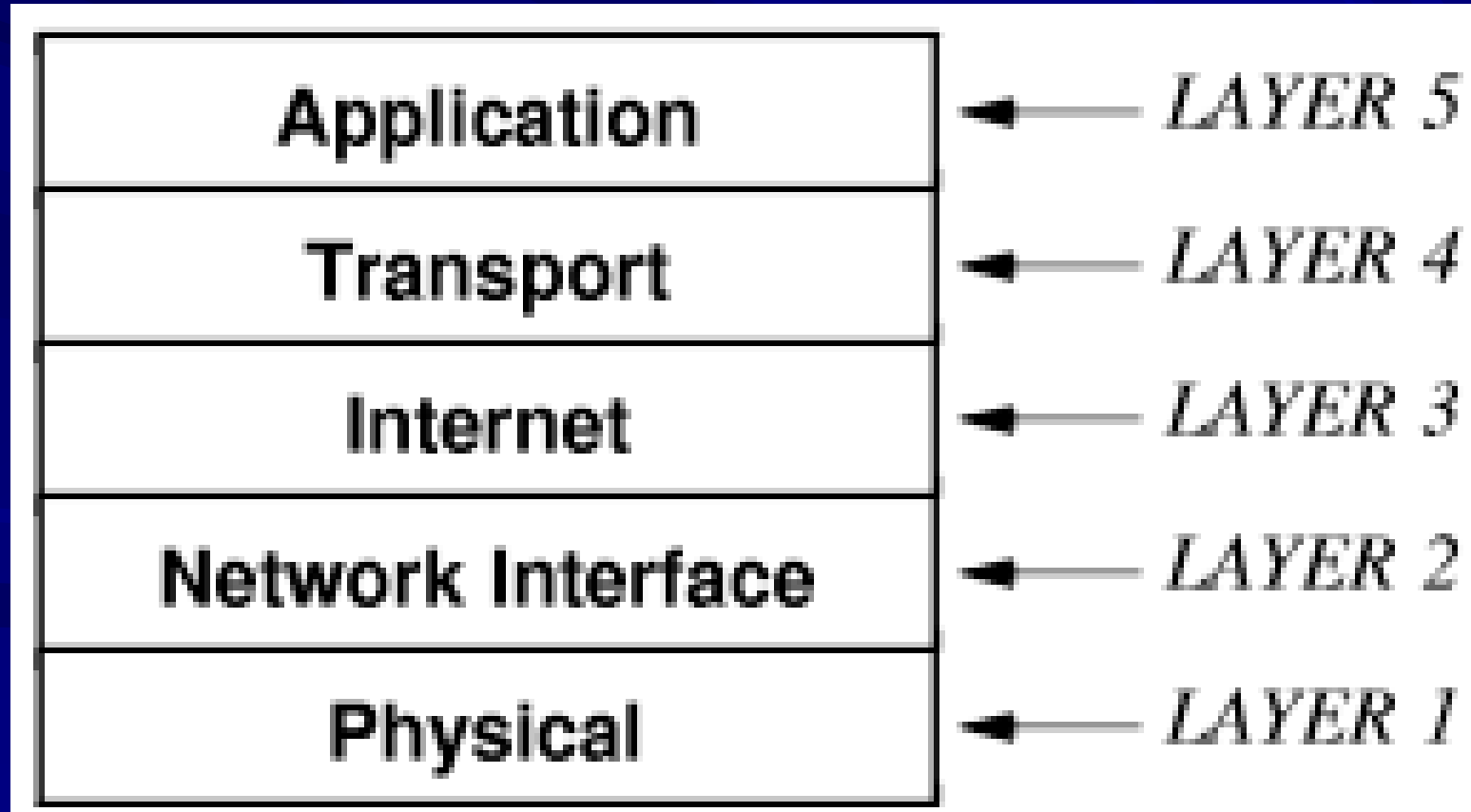


## **20.10 Protocols For Internetworking**

- **Work on TCP/IP began in the 1970s.**
- **TCP/IP was the first set of protocols developed for use in an internet.**

# 20.12 Layering and TCP/IP Protocols

- TCP/IP layering model, or Internet layering Model, or Internet Reference Model.



## 20.13 Host computers, Routers, and Protocol Layers

- Host computer to refer to any computer system that connects to an internet and runs applications.
- Both hosts and routers need TCP/IP protocol software.
- Routers do not use protocols from all layers.

# 作业

- 理解TCP/IP协议的层次结构和各层功能，比较与ISO/OSI参考模型的异同。
- TCP/IP网络体系结构为什么要保证网络层的协议一致。