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# Part 1: Introduction

# Summary

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- (1) Contact information**
- (2) Course objective and topics**
- (3) Course evaluation**
- (4) \* The layering principle of network protocols**
- (5) \* Connection-oriented and connectionless services**
- (6) Service primitives**
- (7) The relationship of services to protocols**
- (8) \* Reference models**

# (1) Contact Information

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Course web page: <http://www.csc.uvic.ca/~wkui/Courses/networks/index.htm>

Lab web page: <http://www.csc.uvic.ca/~csc450>

Webboard: <http://webboard.uvic.ca/>

Instructor: Kui Wu

Email: [wkui@cs.uvic.ca](mailto:wkui@cs.uvic.ca)

Office hours: TW 2:00 - 3:00 p.m.

EOW: 233

# (2.1) Course Objectives

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- To help you gain a general understanding of the principles and concepts governing the operations of computer networks;
- To provide you with the opportunity to become skillful in the implementation and use of communication protocols;
- To help you grasp the basic research methodologies in the field of computer networks (for CSc 550 students).

## (2.2) Topics

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- Overview of network layers and protocols
- The Physical Layer
  - transmission media
  - the Nyquist limit and the Shannon limit
- \* The Data Link Layer
  - framing
  - error detecting and correcting codes
  - sliding window protocols
- \* The Medium Access Control Layer
  - ALOHA
  - IEEE 802.3
  - IEEE 802.11
- \* The Network Layer
  - routing algorithms
  - congestion control
  - IP
- \* The Transport Layer
  - connection establishment/termination
  - multiplexing
  - flow control
  - TCP and UDP
- Utility Protocols

# (3) Course Evaluation

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For CSC 450 Students:

- Two lab projects: 40%
- Midterm exam: 20%
- Final exam: 40%

For CSC 550 Students:

- Two lab projects: 30%
- Midterm exam: 20%
- Final exam: 40%
- Course project: 10%

Final Grade:

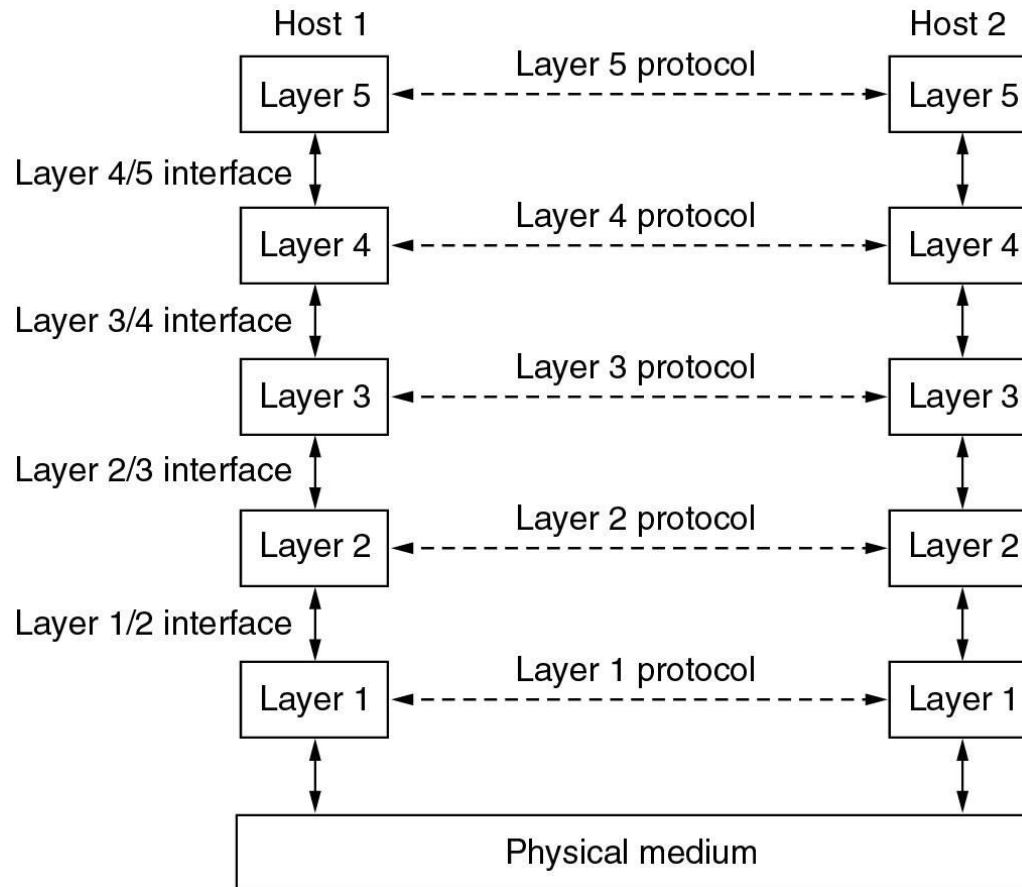
F	D	C	C+	B-	B	B+	A-	A	A+
0-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-105

## (4.1) Protocols

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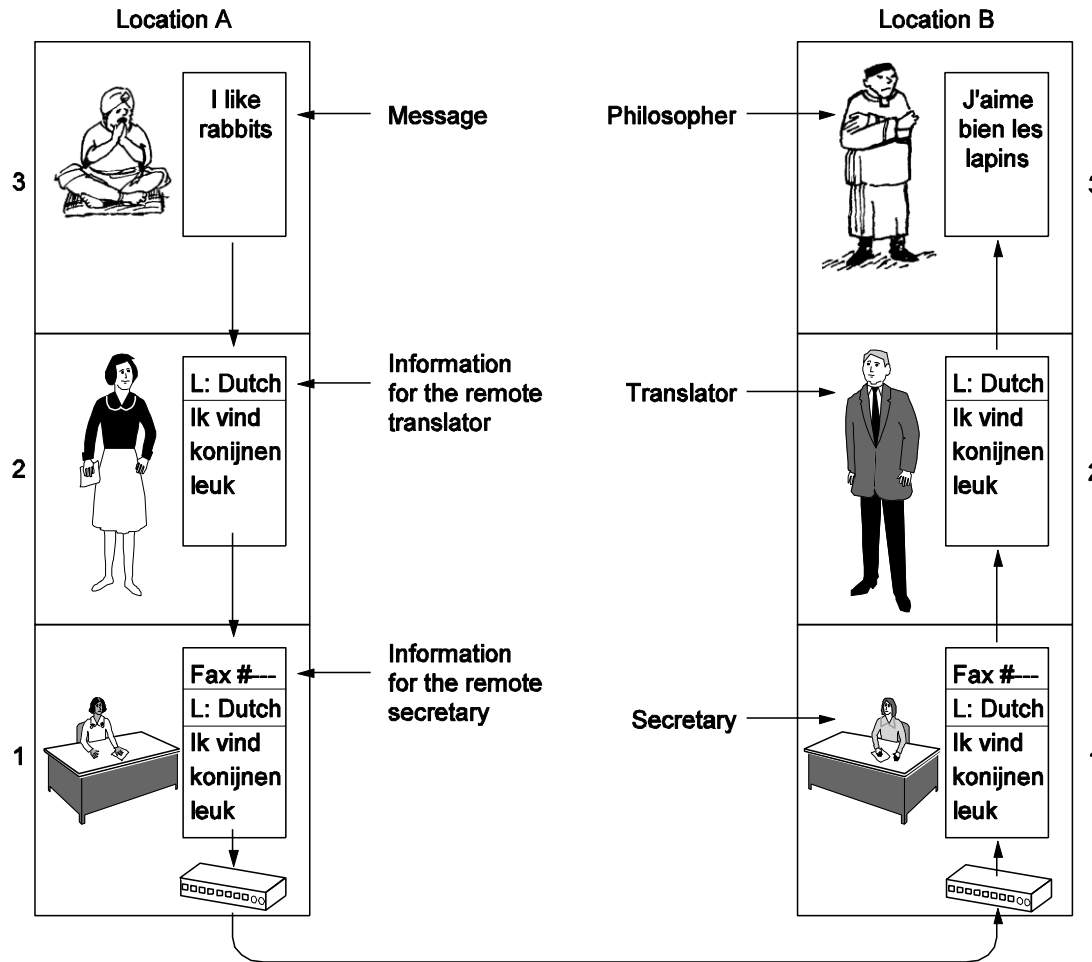
Basically, a protocol is an agreement between the communicating peers on how communication is to proceed.

## (4.2) The layering Principle (1)

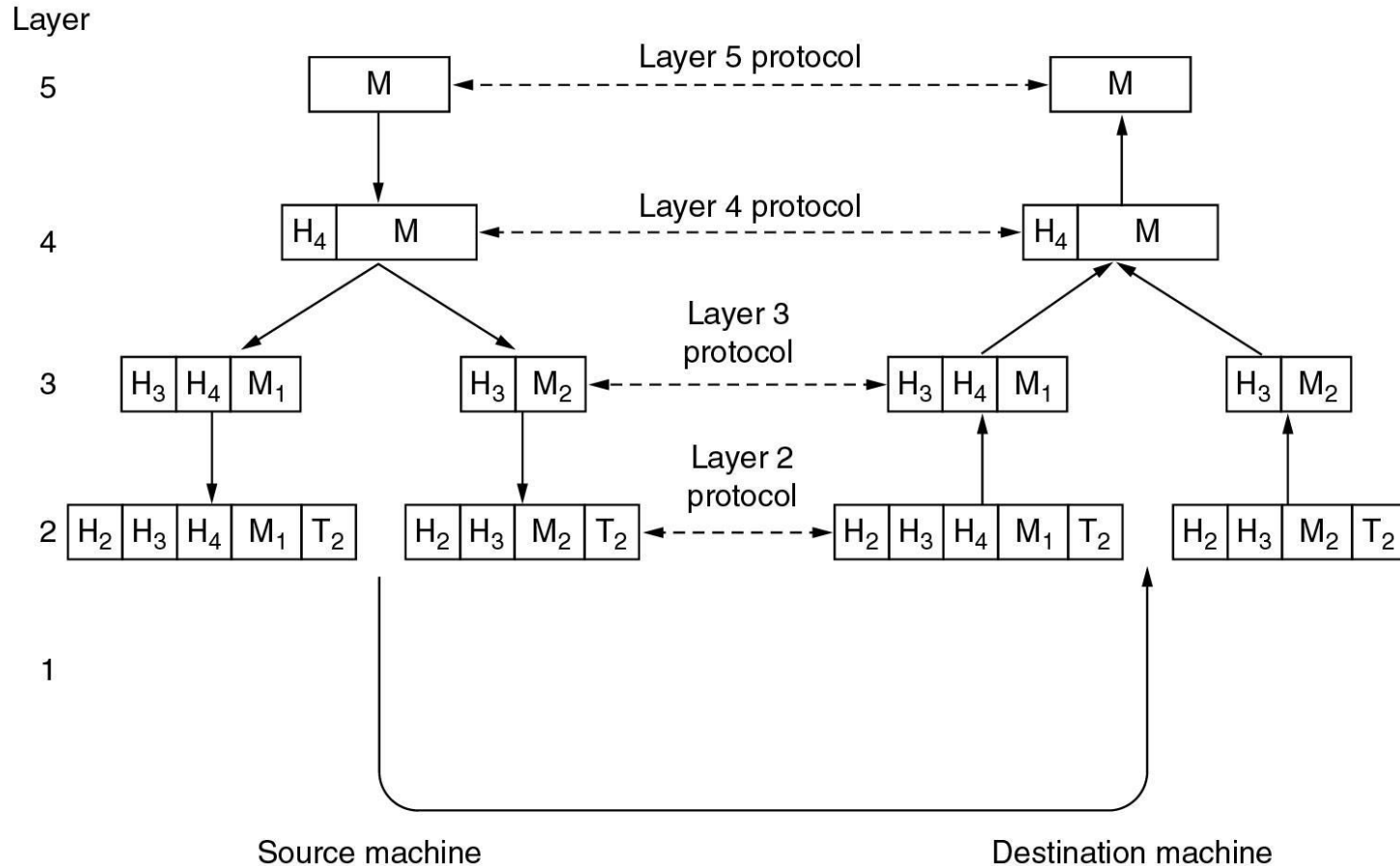




## (4.2) The layering Principle (2)



## (4.2) The layering Principle (3)



# (5) Connection-Oriented vs. Connectionless

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		Service	Example
Connection-oriented	{	Reliable message stream	Sequence of pages
		Reliable byte stream	Remote login
		Unreliable connection	Digitized voice
Connection-less	{	Unreliable datagram	Electronic junk mail
		Acknowledged datagram	Registered mail
		Request-reply	Database query

## (6) Service Primitives

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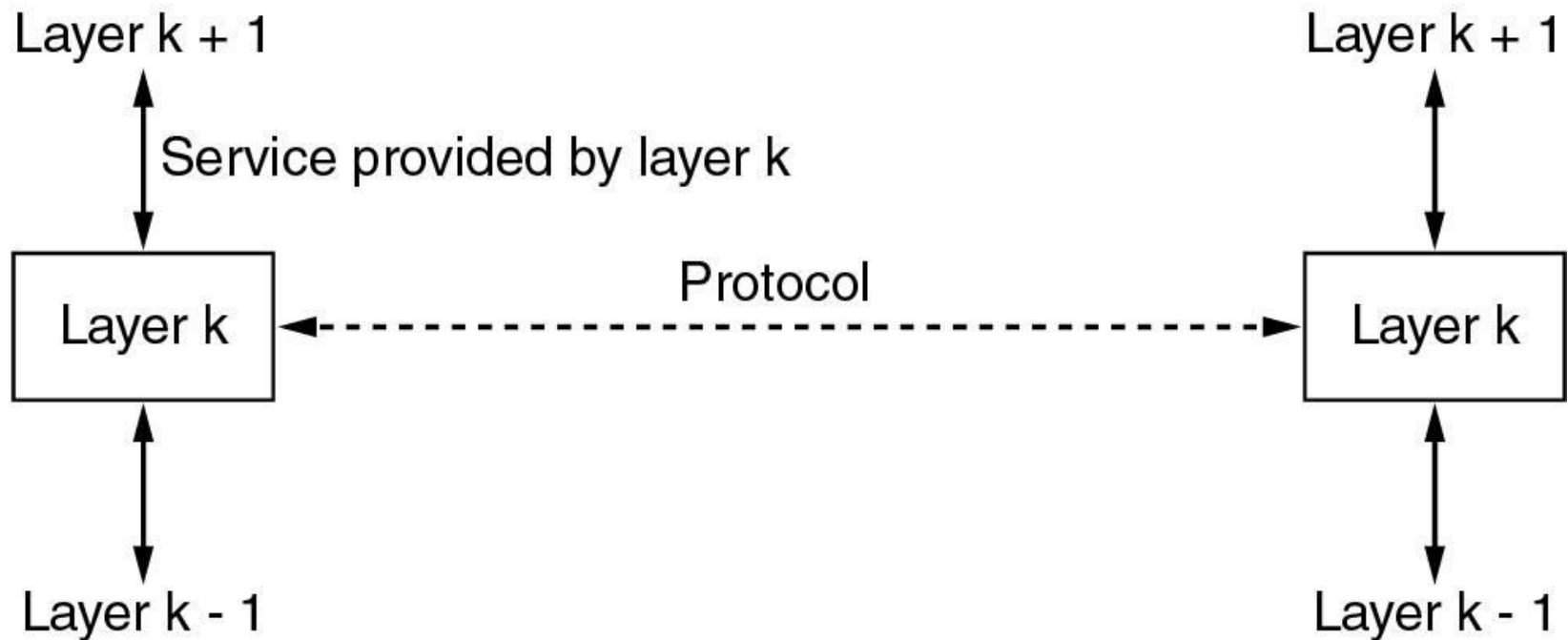
A service is formally specified by a set of primitives (basic operations) available to a user or other entity to access the service.

Primitive	Meaning
LISTEN	Block waiting for an incoming connection
CONNECT	Establish a connection with a waiting peer
RECEIVE	Block waiting for an incoming message
SEND	Send a message to the peer
DISCONNECT	Terminate a connection

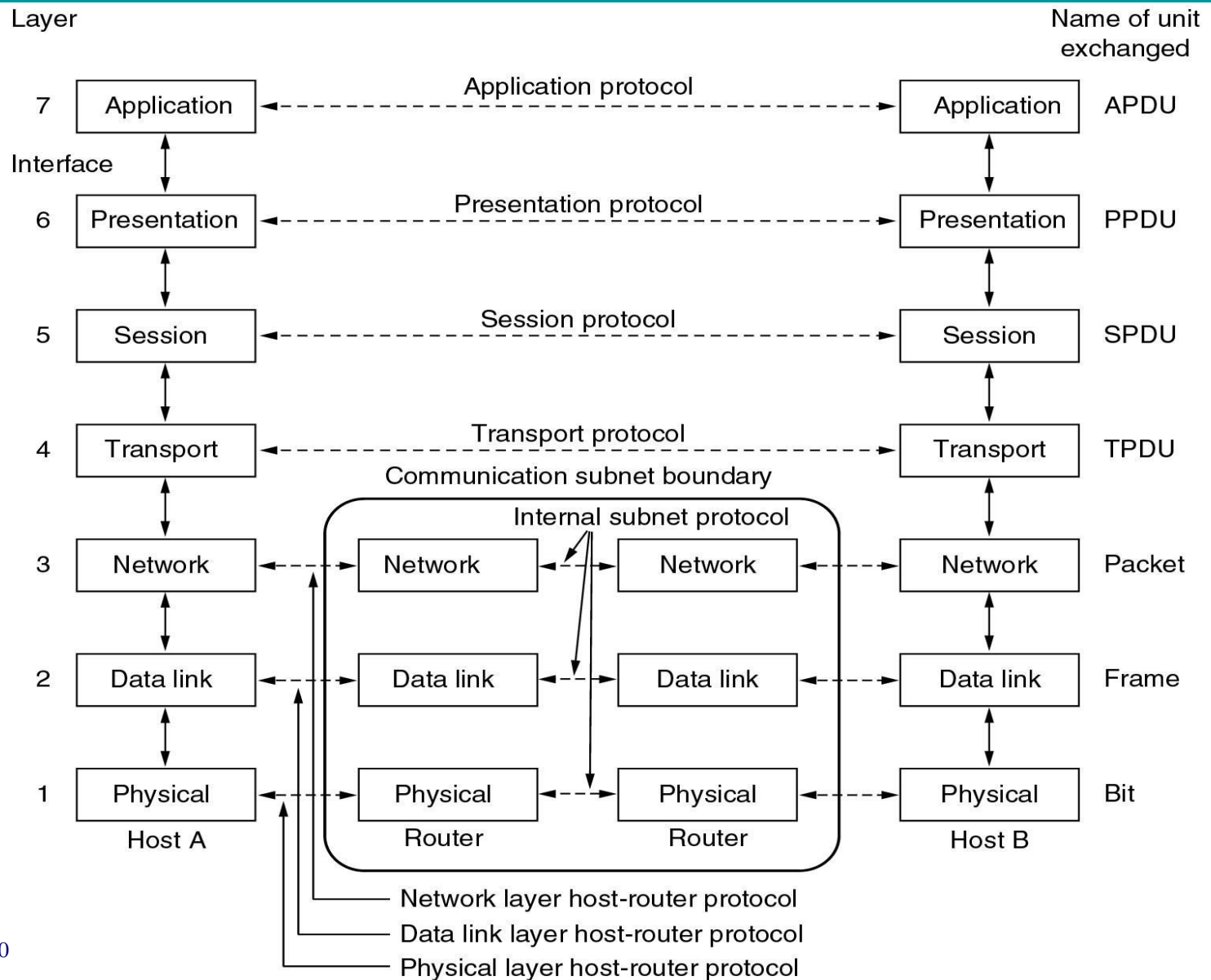
Example: five service primitives for implementing a simple connection-oriented service.

## (7) The relationship of Service

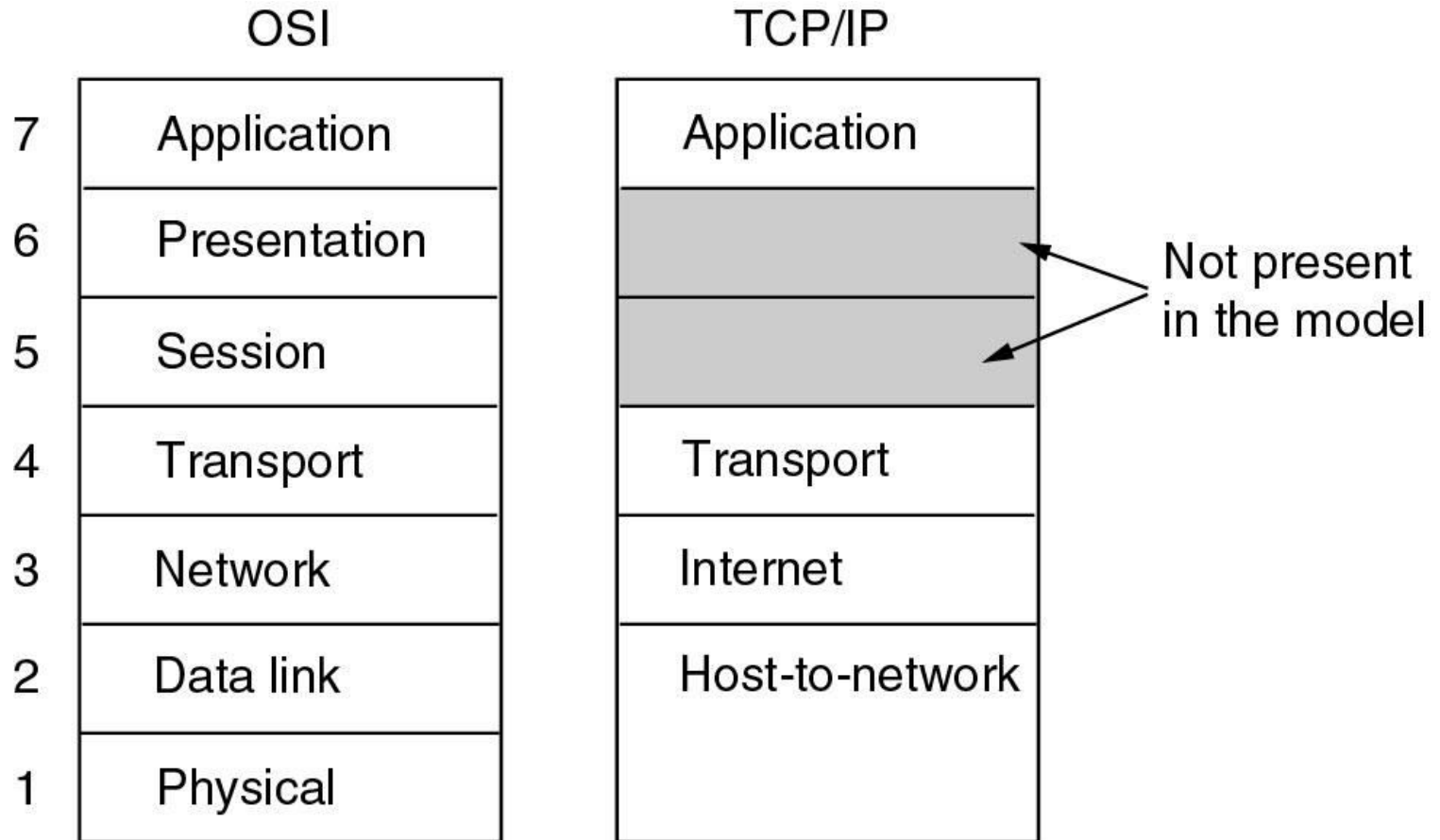
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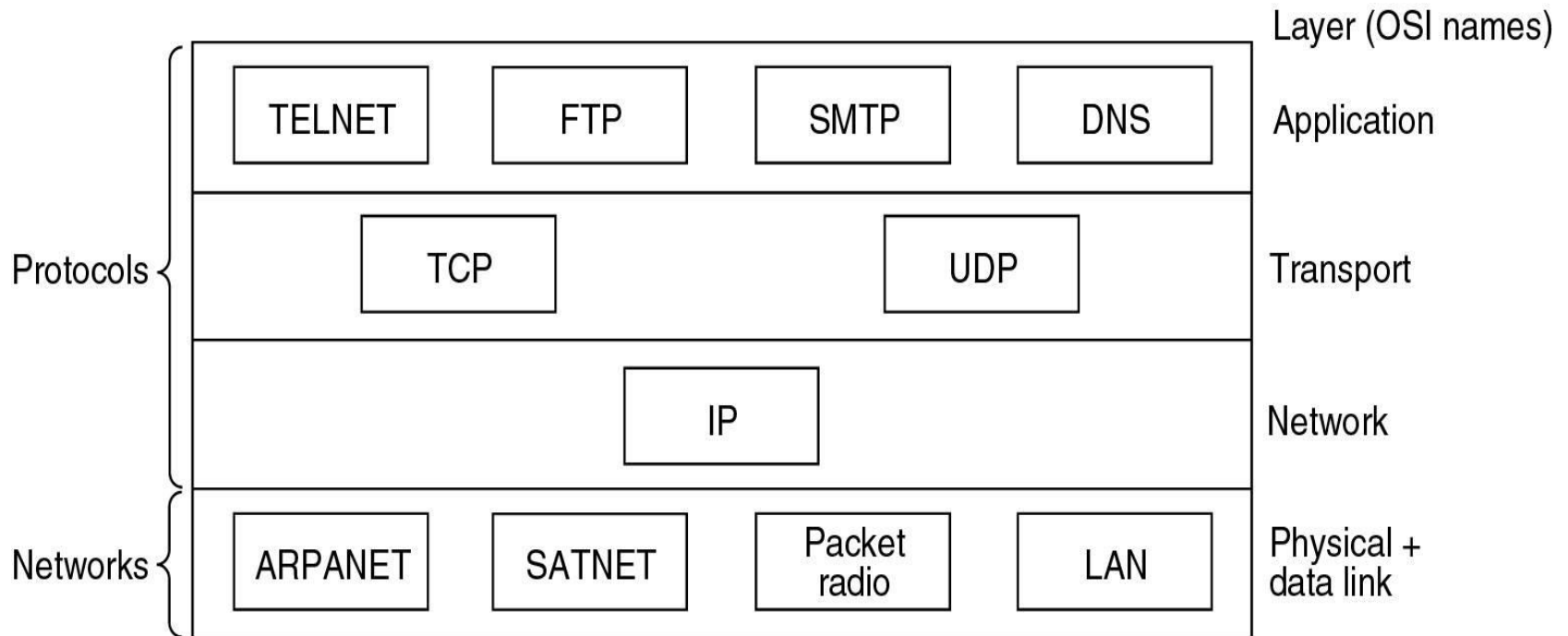
# (8.1) The OSI Reference Model



## (8.2) The TCP/IP Reference Model (1)



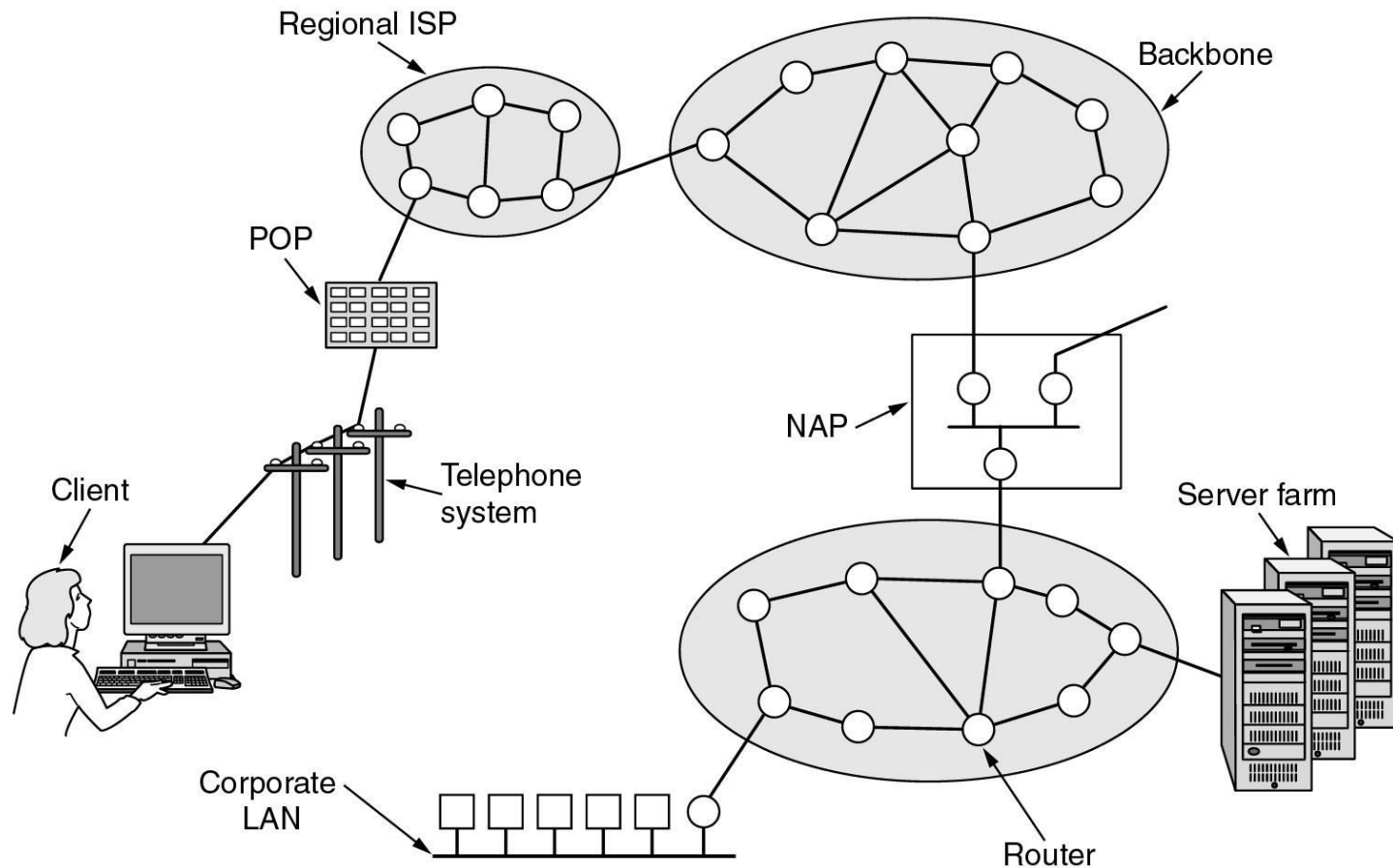
## (8.2) The TCP/IP Reference Model (2)



Protocols and networks in the TCP/IP model initially.



## (8.2) The TCP/IP Reference Model (3)



Overview of the Internet.