

CS 4453 Computer Networks

Chapter 1 Introduction

2015 Winter

1.1 An overview

- Computer networks now are almost everywhere.
- Most software developers need some knowledge of computer networks.
- Internet is complicated, that is a network of networks.
- The basics of network are communication links and packet switches
- Internet keeps changing.

1.2 Key aspects of networking

- Network applications and network programming
- Data communications
- Packet switching and networking technologies
- Internetworking with TCP/IP
- Network security
- Additional networking concepts and technologies

1.3 Protocols, standards and models

We need some rules for everyone so that the multiple entities connecting to the internet must agree and follow.

These agreements are called communication protocols, network protocols or protocols.

A communication protocol specifies the details for one aspect of computer communication, including actions to be taken when errors or unexpected situations arise.

Protocols are divided into layers.

There are two popular protocol models. One is OSI model we will discuss later. The other one is Internet Protocol model (TCP/IP model). The Internet Protocol model consists of 5 layers as shown in Figure 1.

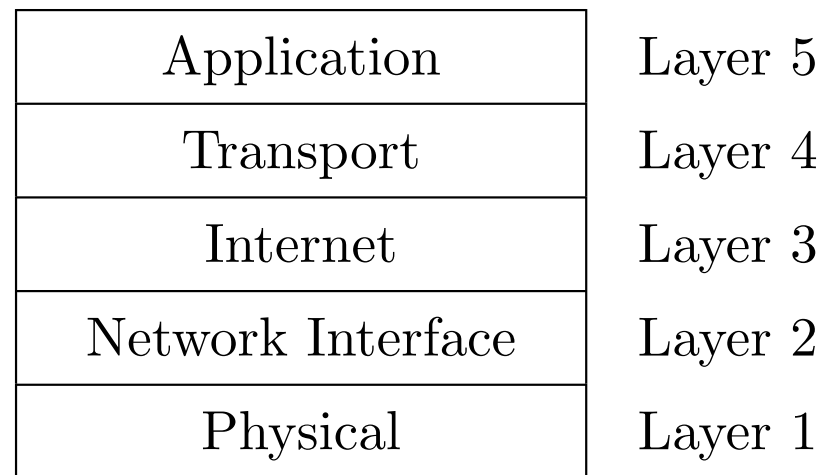


Figure 1: TCP/IP model of networks

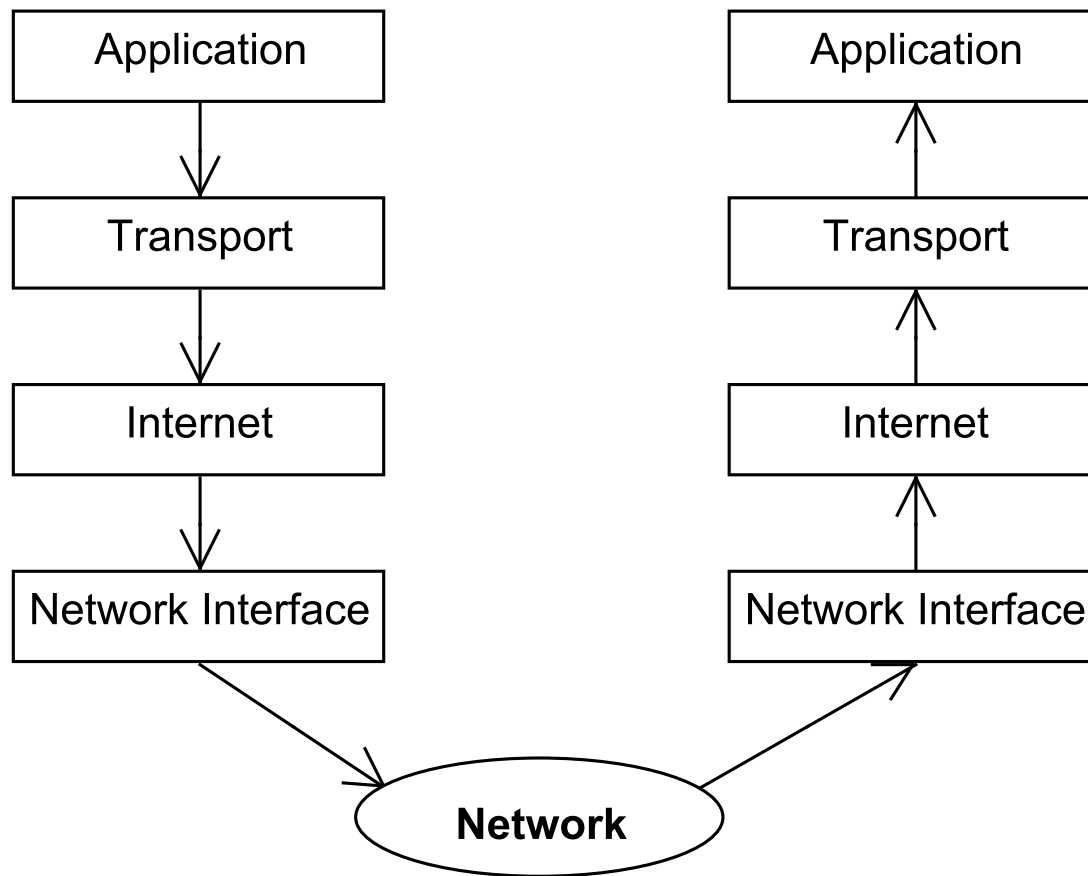


Figure 2: How data passing through layers

We need some standard for the protocols so that everyone can follow.

Internet standards are developed by the Internet Engineering Task Force (IETF). The IETF standard documents are called requests for comments (RFCs).

Other bodies also specify standards for network components, most notably for network links. The IEEE 802 LAN/MAN Standards Committee specifies the Ethernet and wireless WiFi standards.

1.4 Internet trends

- VoIP
- Network TV
- Digital cellular
- Wireless access
- Big data
- Social networks
- Sensor networks
- Online banking, shopping etc.
- Internet of things
- Cloud computing