Chapter 23

Introduction To Transport Layer

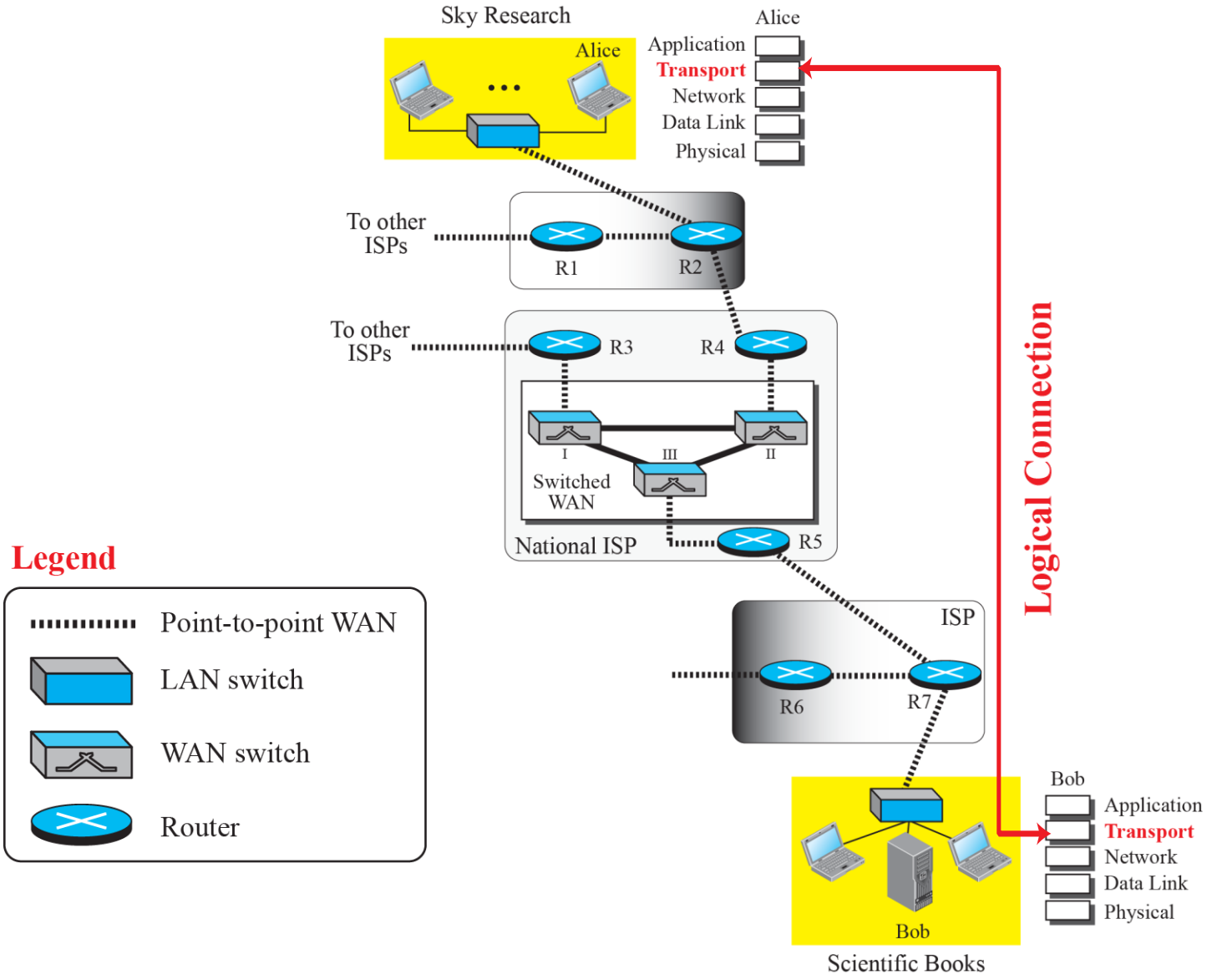
23-1 INTRODUCTION

The transport layer is

- ***located between the application layer and the network layer***

- ***provides a process-to-process communication between two application layers***

Logical connection at the transport layer



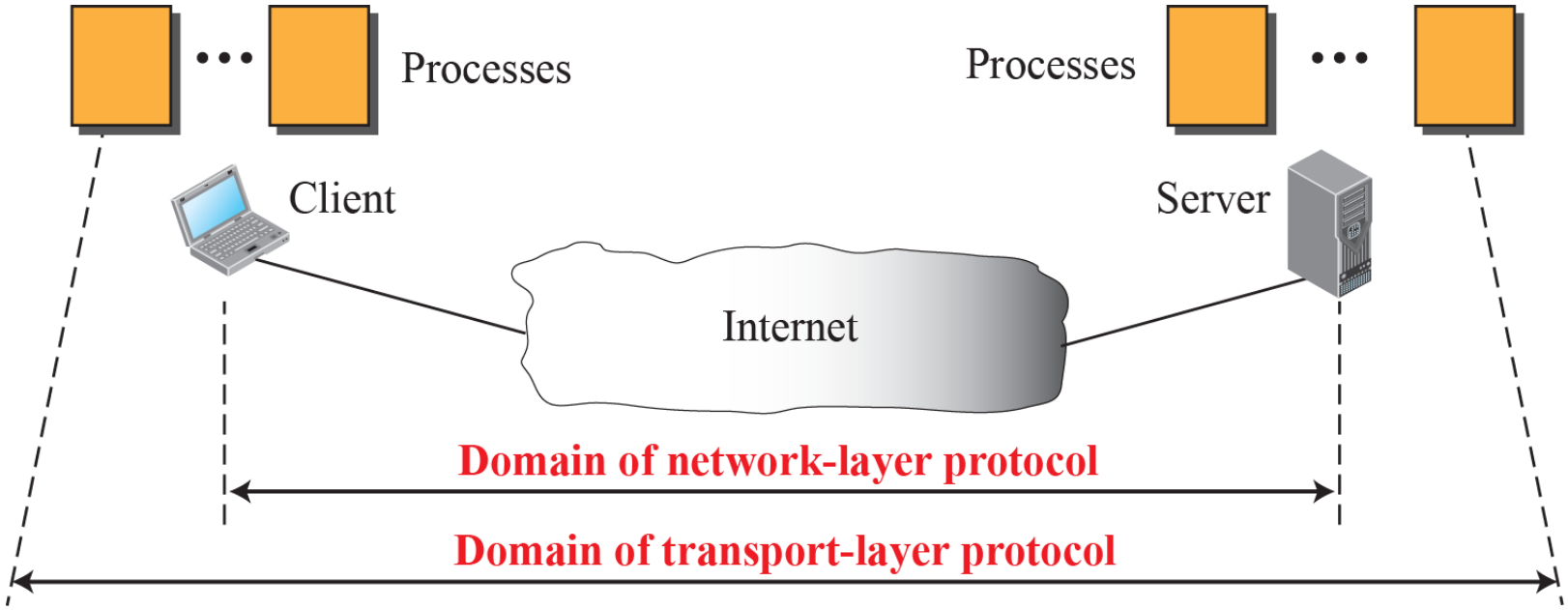
Transport-Layer Services

The transport layer

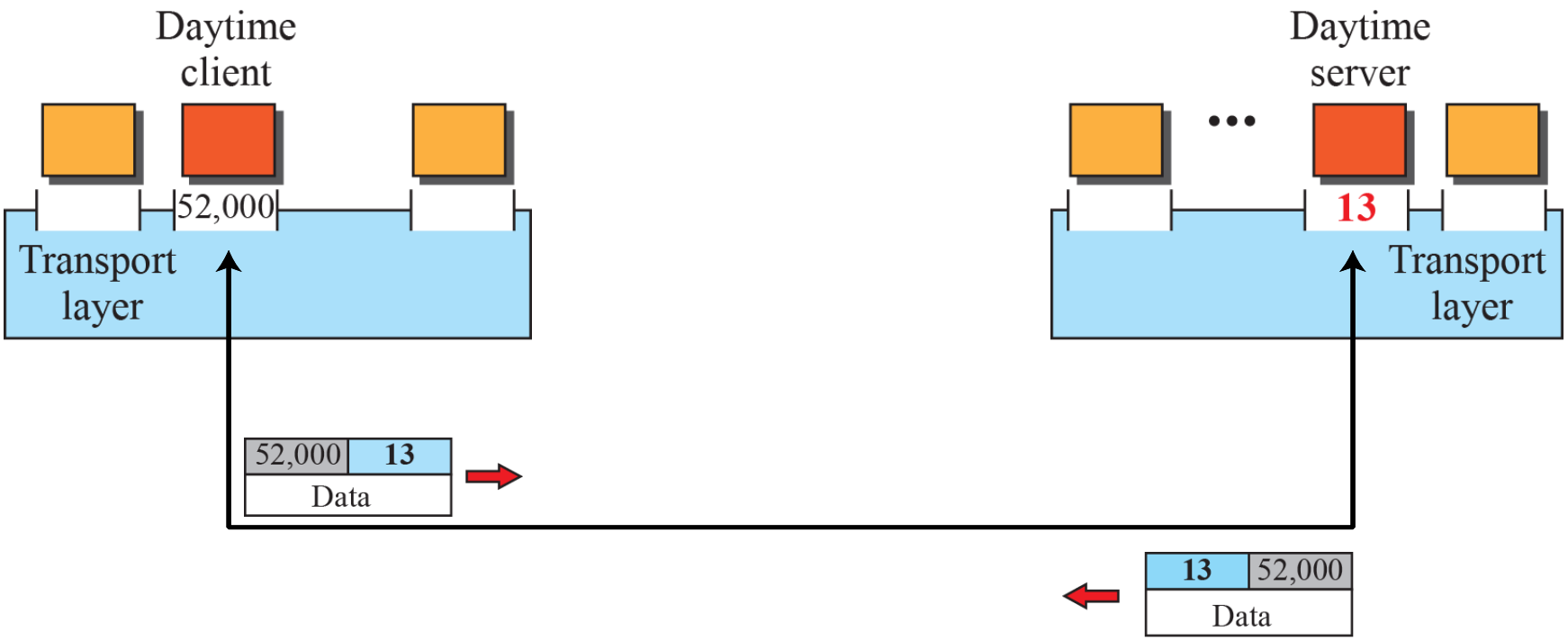
- ***is responsible for providing services to the application layer***

- ***receives services from the network layer.***

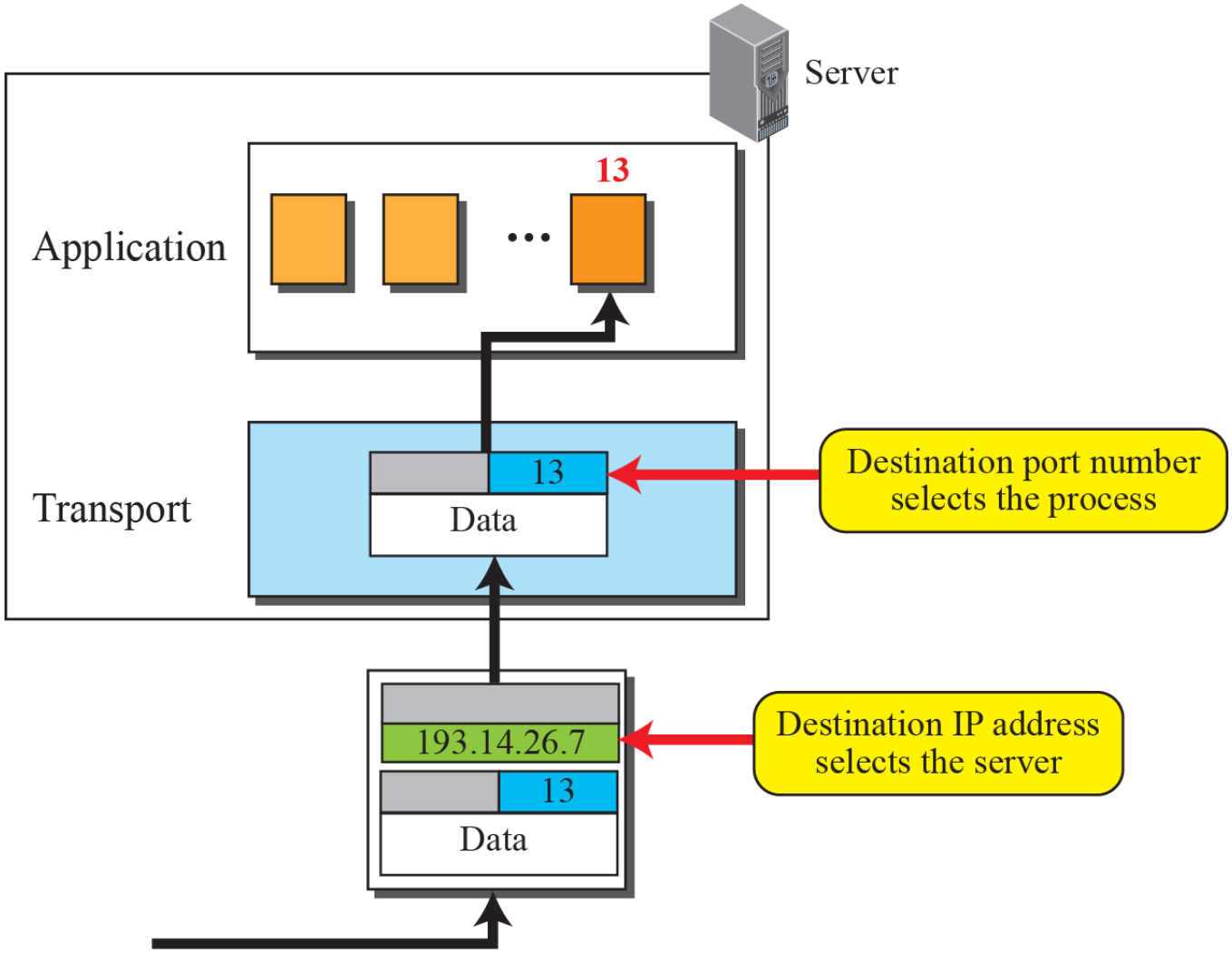
Network layer versus transport layer



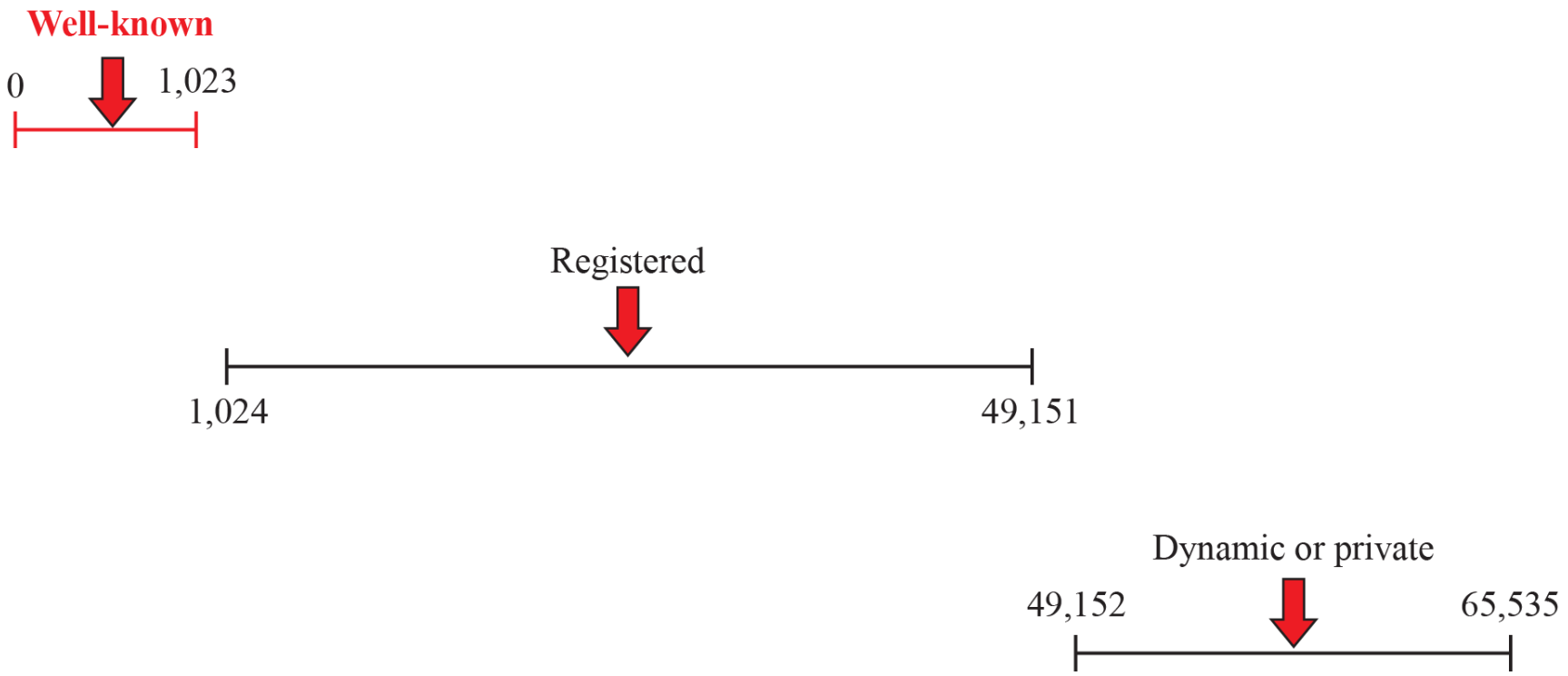
Port numbers



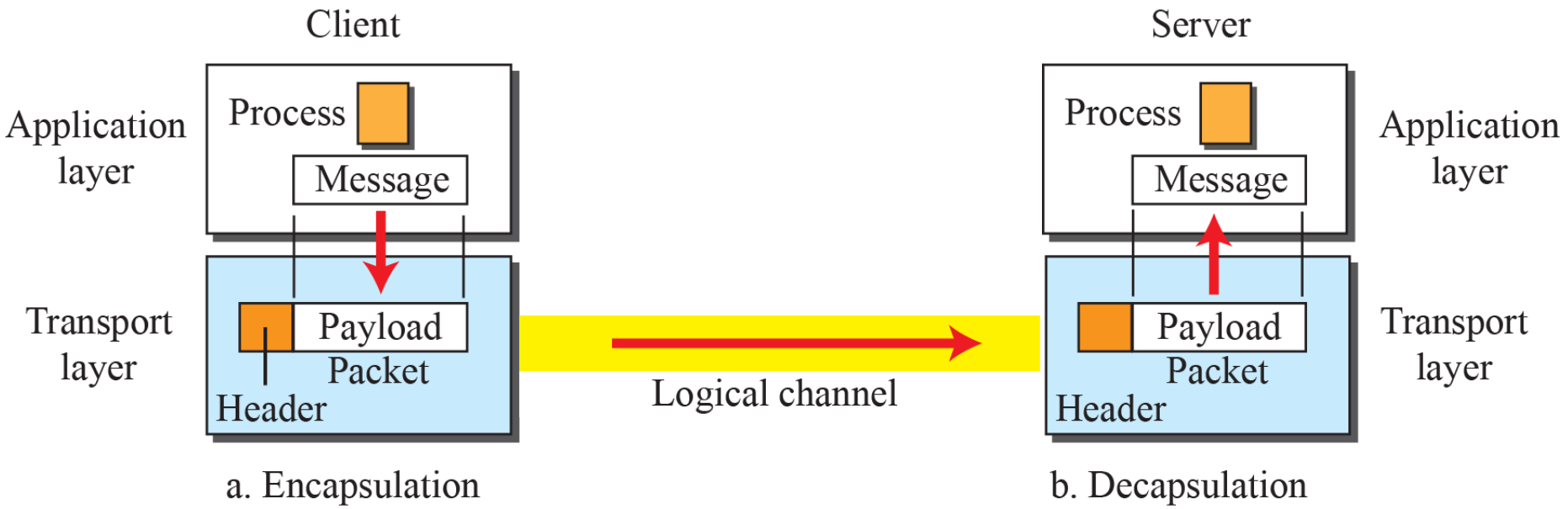
IP addresses versus port numbers



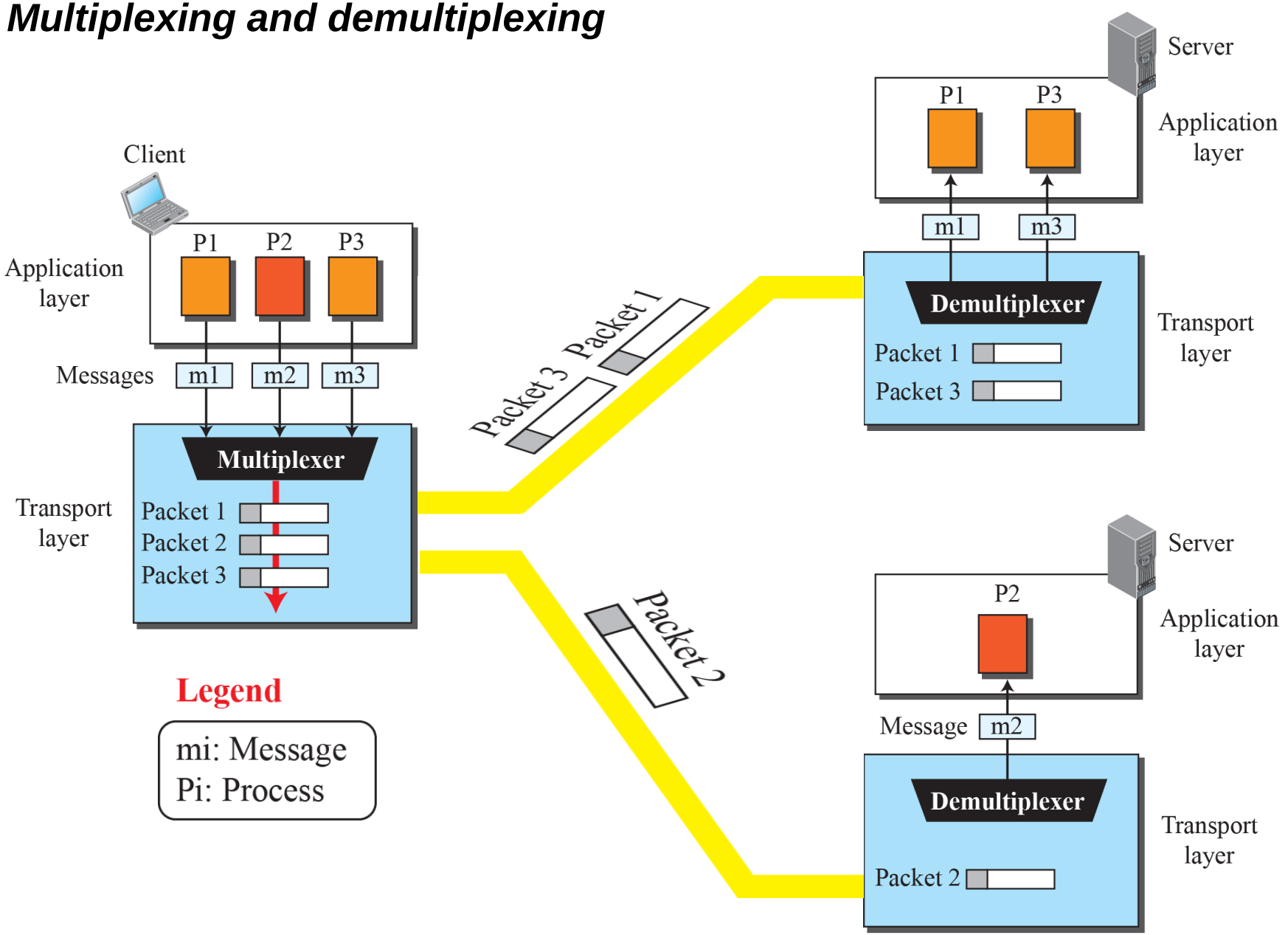
ICANN ranges



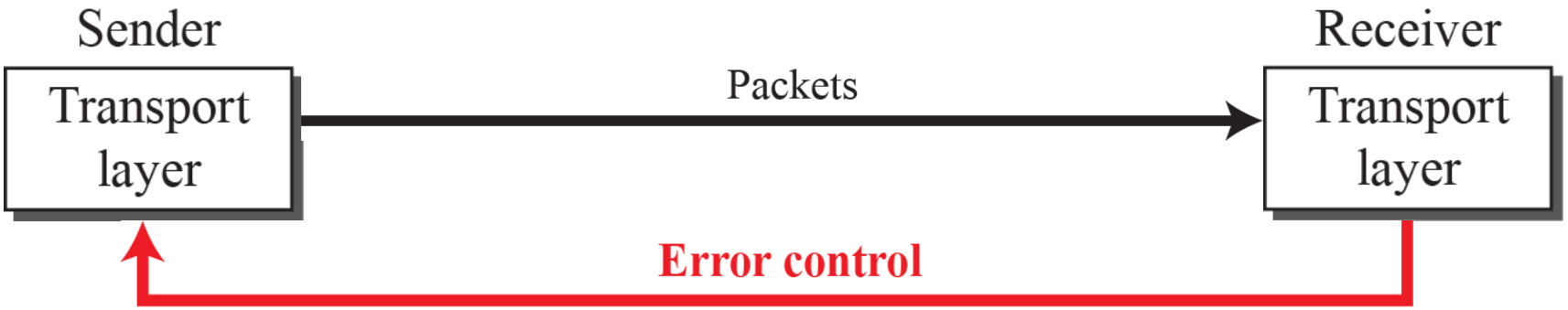
Encapsulation and decapsulation



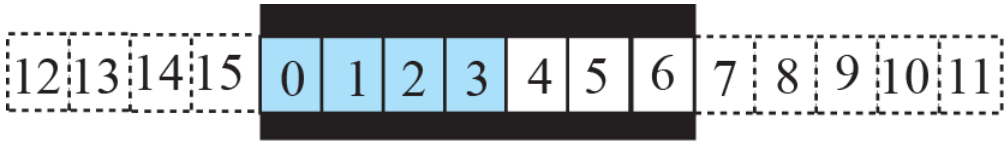
Multiplexing and demultiplexing



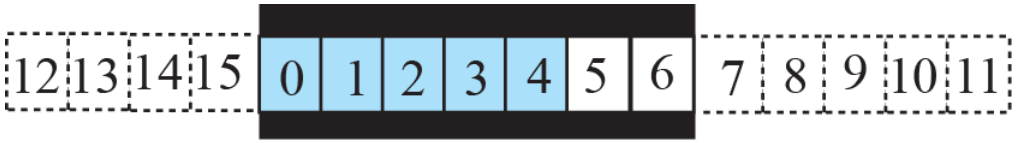
Error control at the transport layer



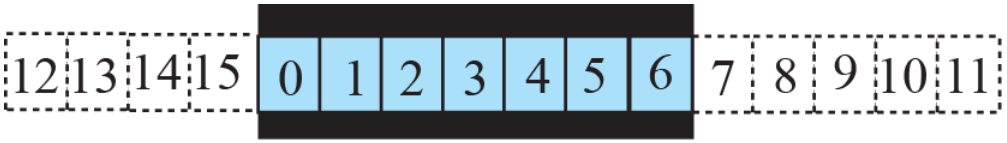
Sliding window in linear format



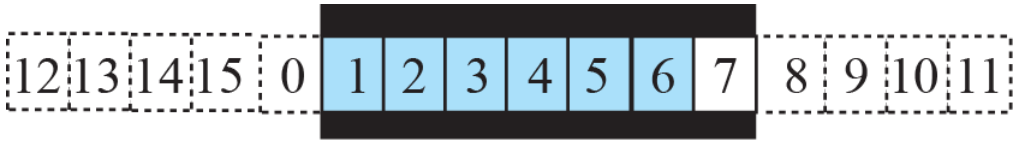
a. Four packets have been sent.



b. Five packets have been sent.



c. Seven packets have been sent;
window is full.



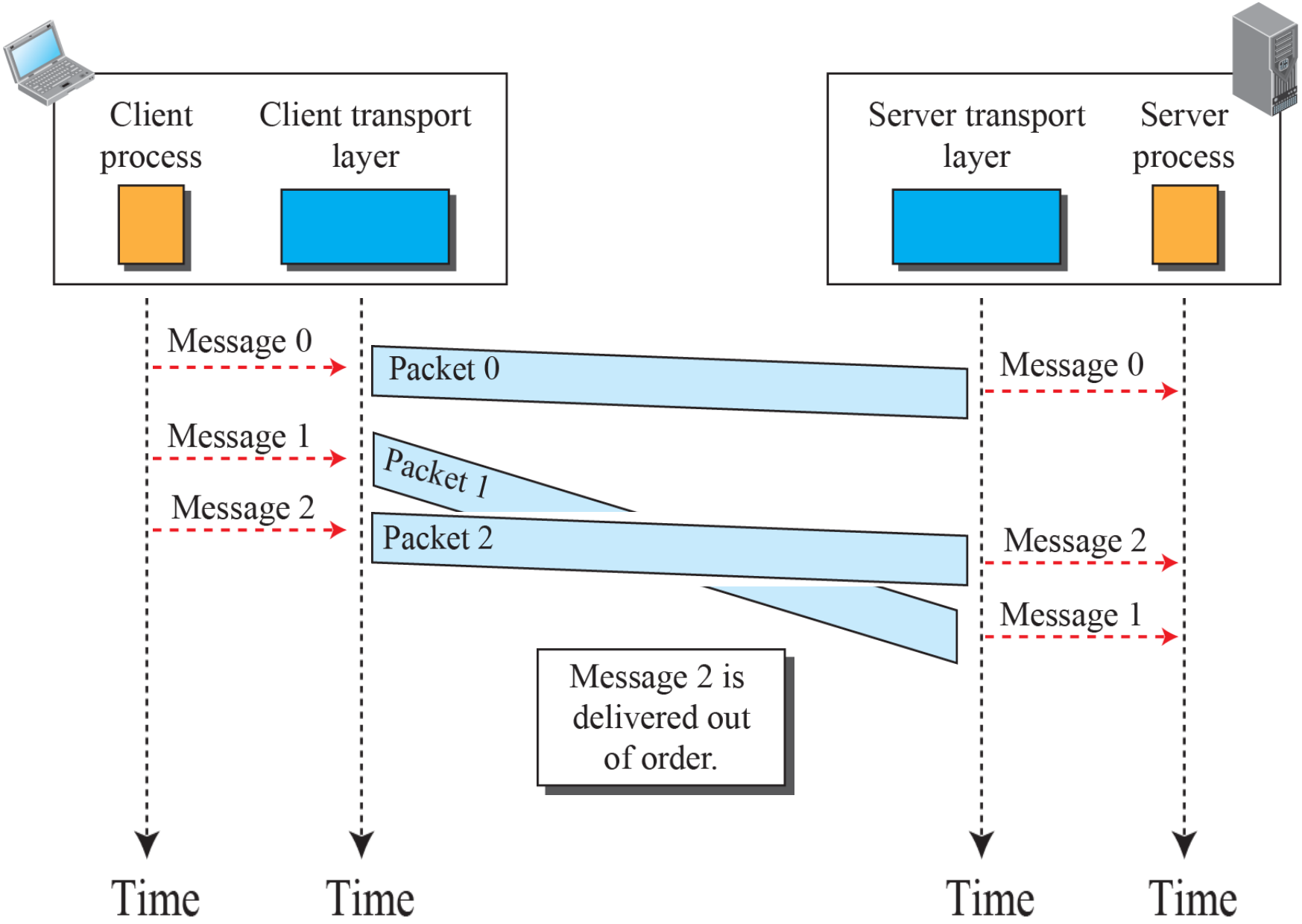
d. Packet 0 has been acknowledged;
window slides.

Connection

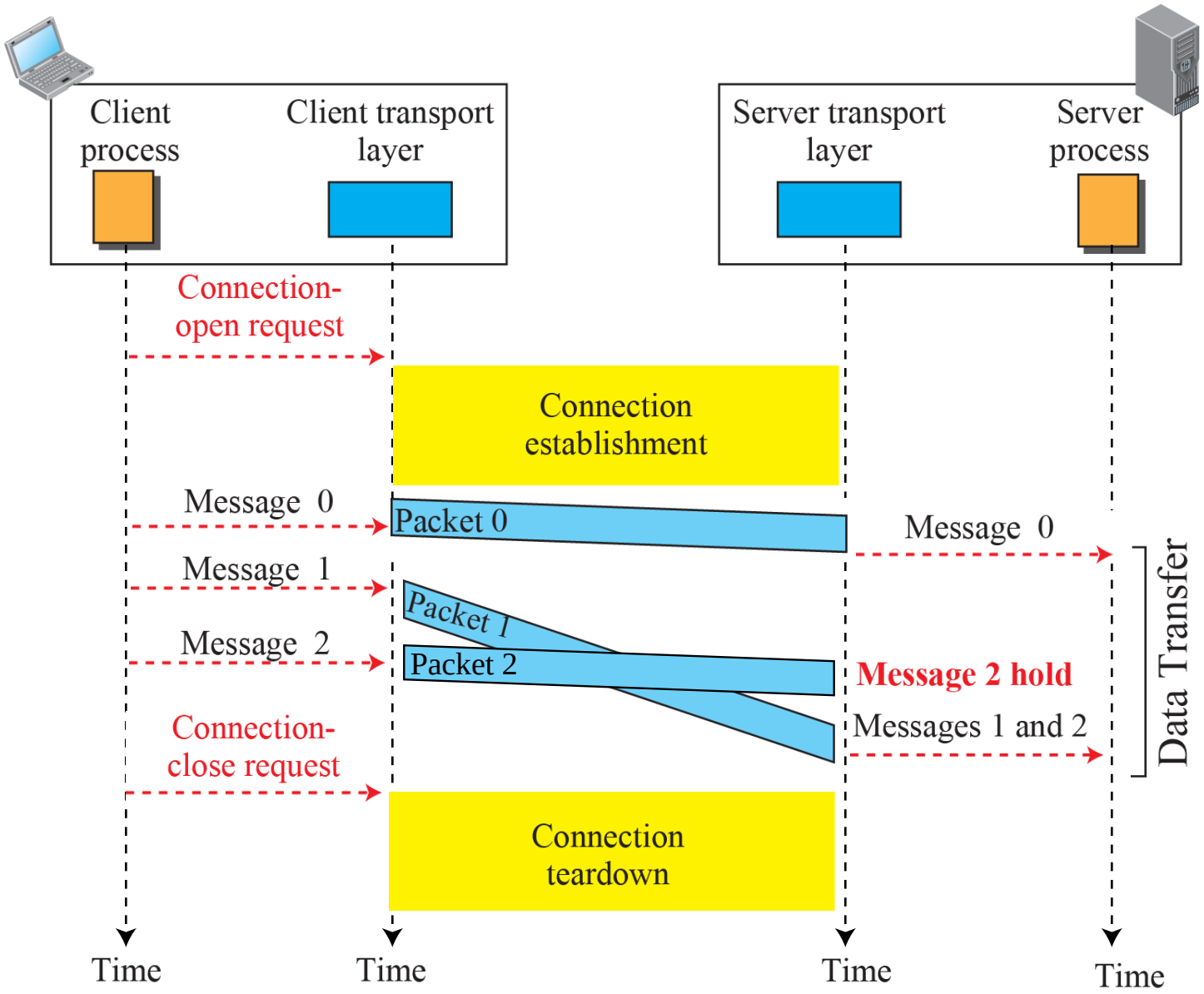
A transport-layer protocol can provide two types of services

- ***connectionless***
- ***connection-oriented***

Connectionless service



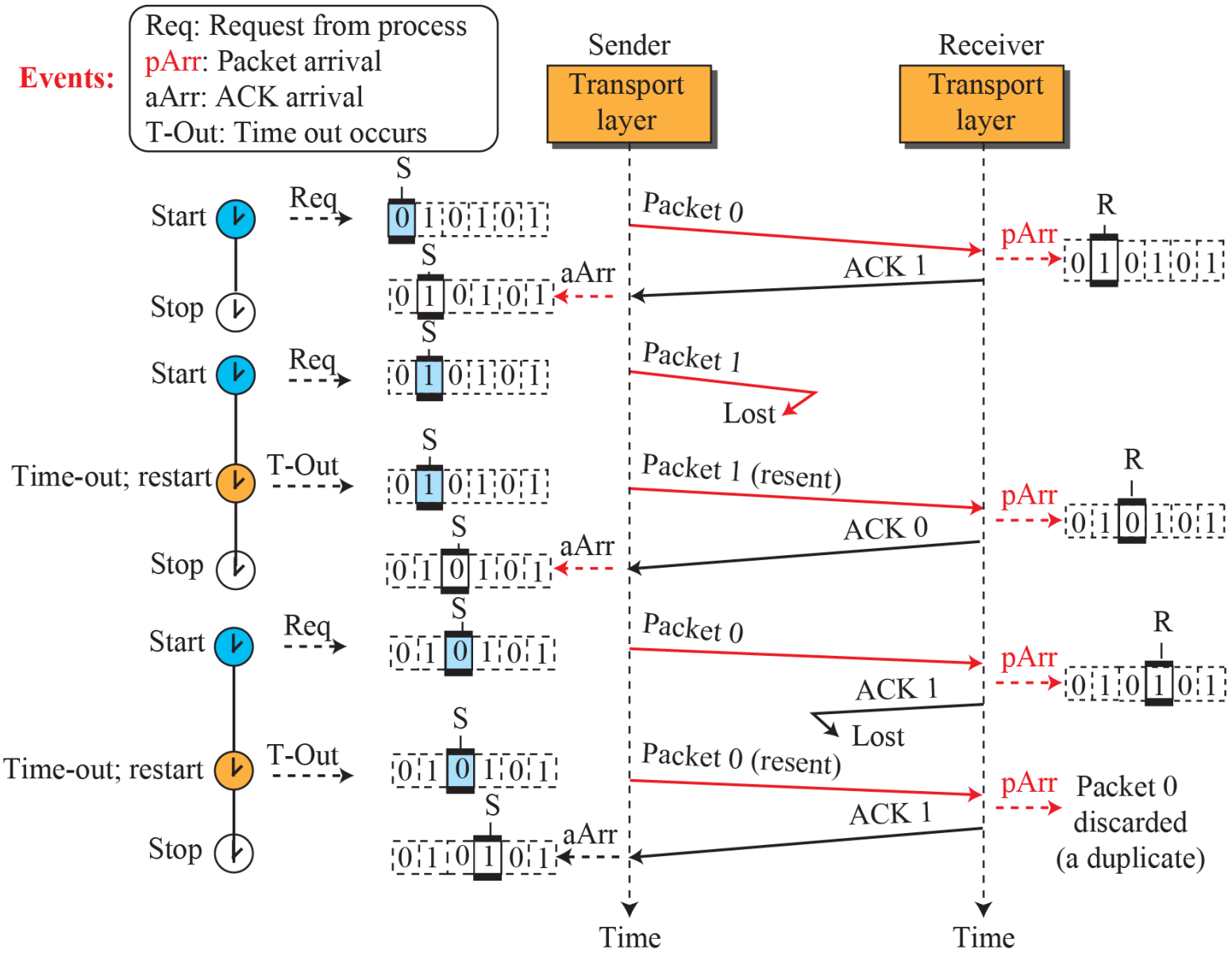
Connection-oriented service



Stop-and-Wait Protocol

- *uses both low and error control.*
- *both the sender and the receiver use a sliding window*
- *the sender sends one packet at a time and waits for an acknowledgment before sending the next one.*
- *to detect corrupted packets, we need to add a checksum to each data packet.*
- *when a packet arrives at the receiver, it is checked. If its checksum is incorrect, the packet is corrupted and silently discarded.*

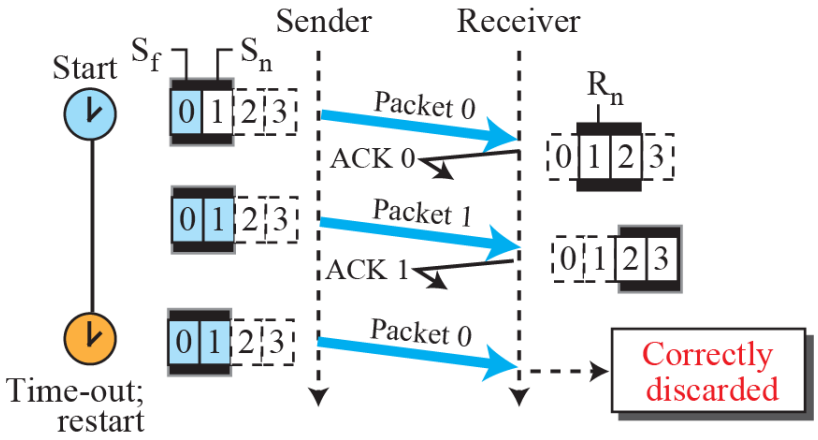
Flow diagram



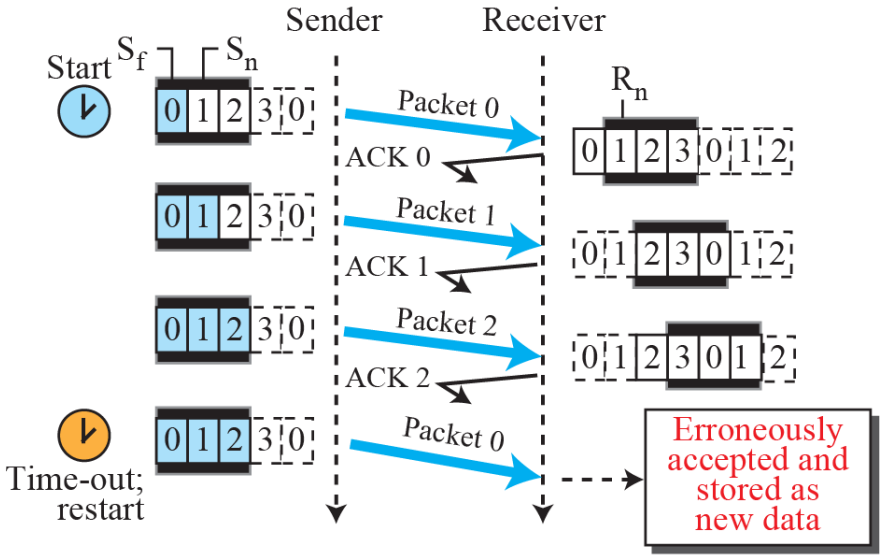
Go-Back-N Protocol (GBN)

Selective-Repeat Protocol

Selective-Repeat, window size



a. Send and receive windows of size = 2^{m-1}



b. Send and receive windows of size > 2^{m-1}