

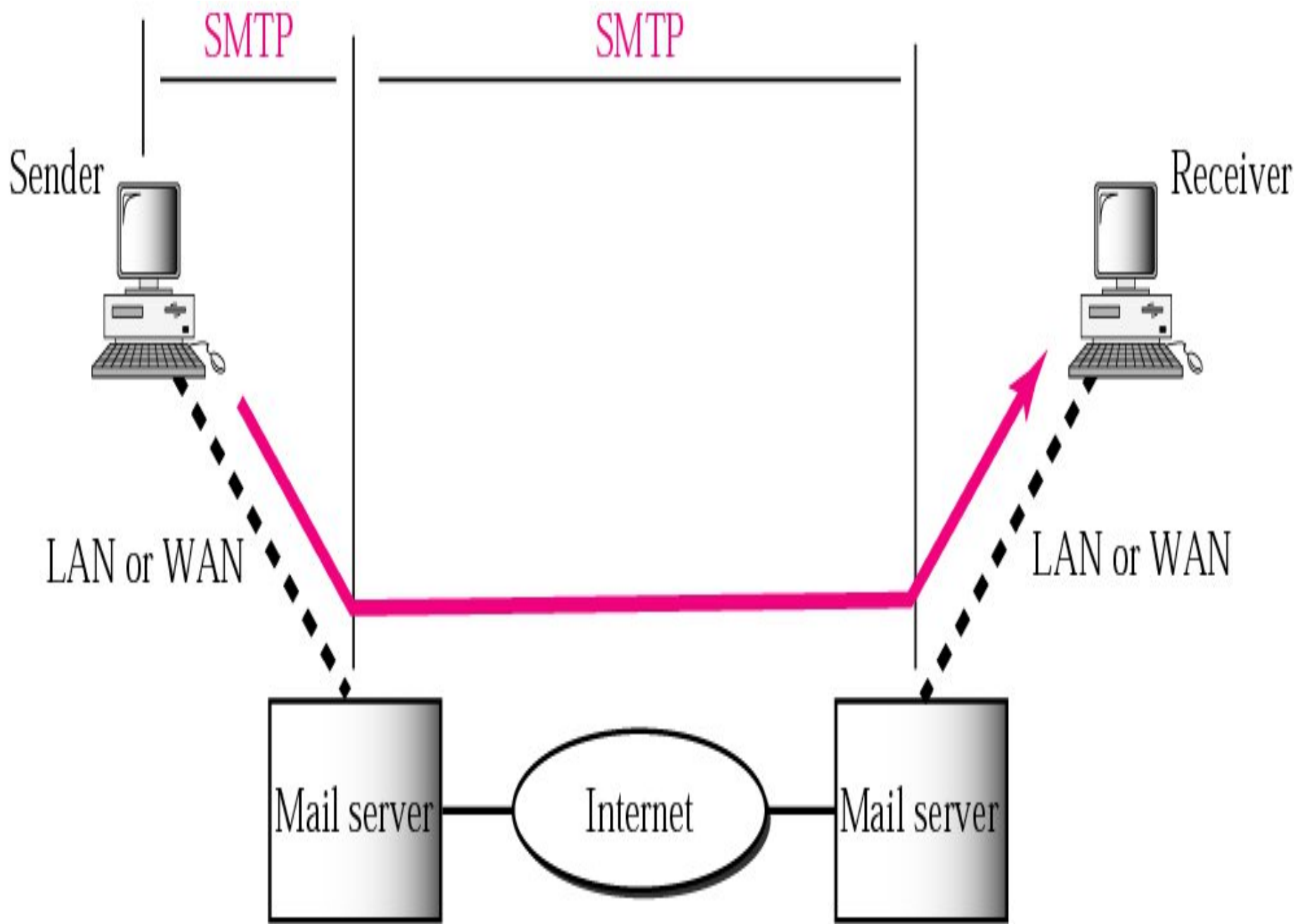
Simple Mail Transfer Protocol (SMTP)

SMTP

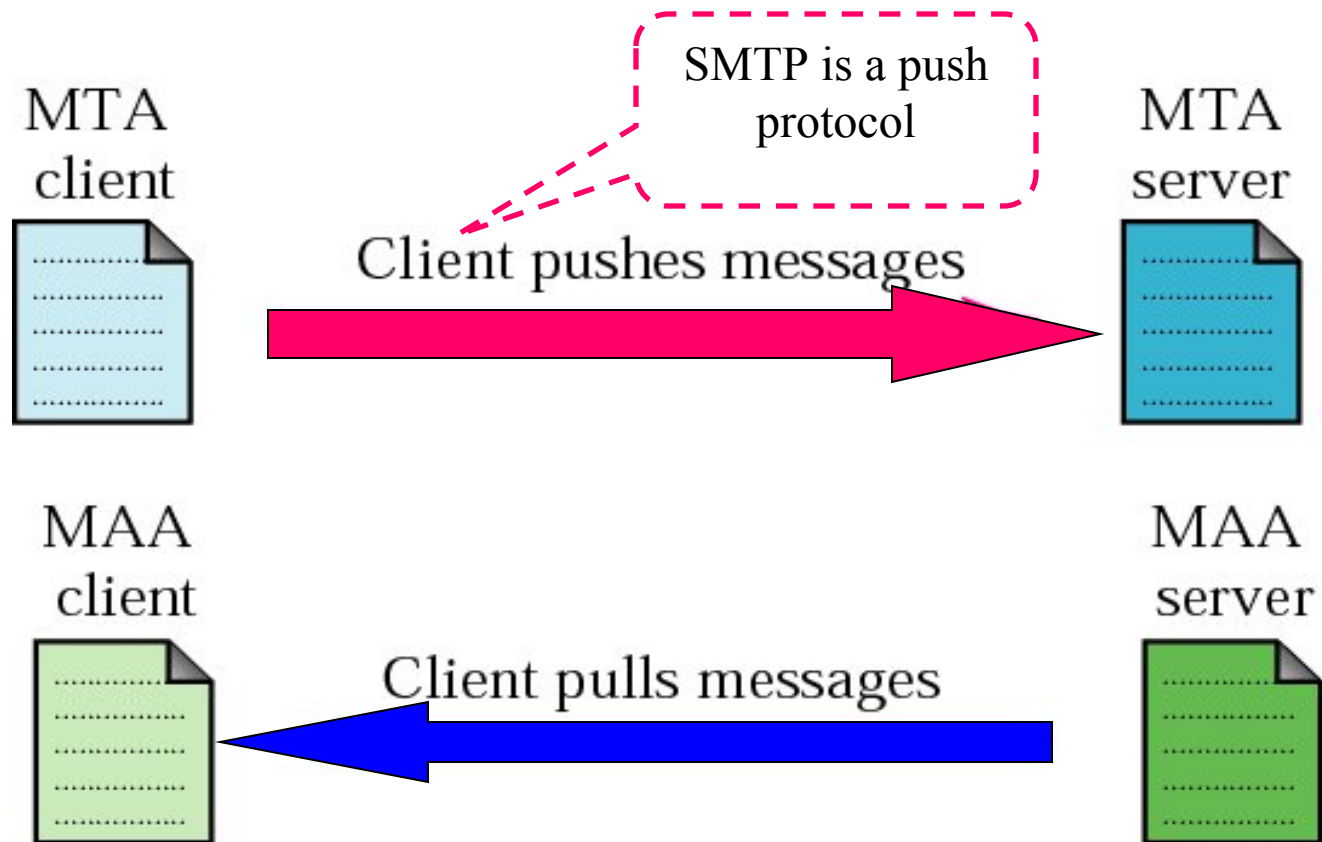
- SMTP stands for Simple Mail Transfer Protocol.
- When an e-mail is sent from the sender to receiver, in most cases this involves, the sender machine sends the email to local SMTP sever, which in then sends mail to recipients local SMTP sever, and finally to recipients local machine.

SMTP

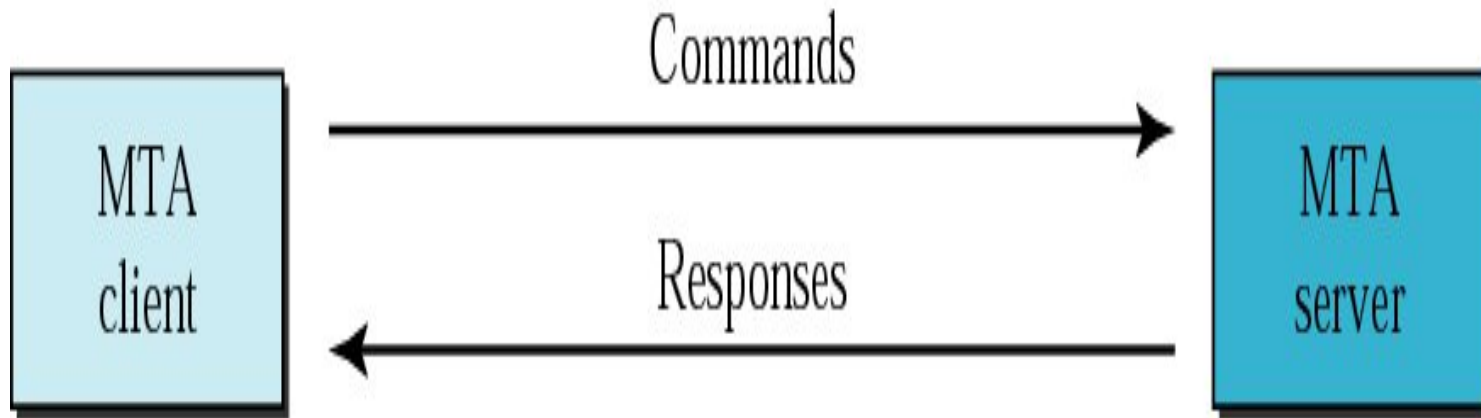
- Actual mail transfer requires MTA (Message transfer agents).
- Sender MTA and Receiver MTA.



Message transfer...



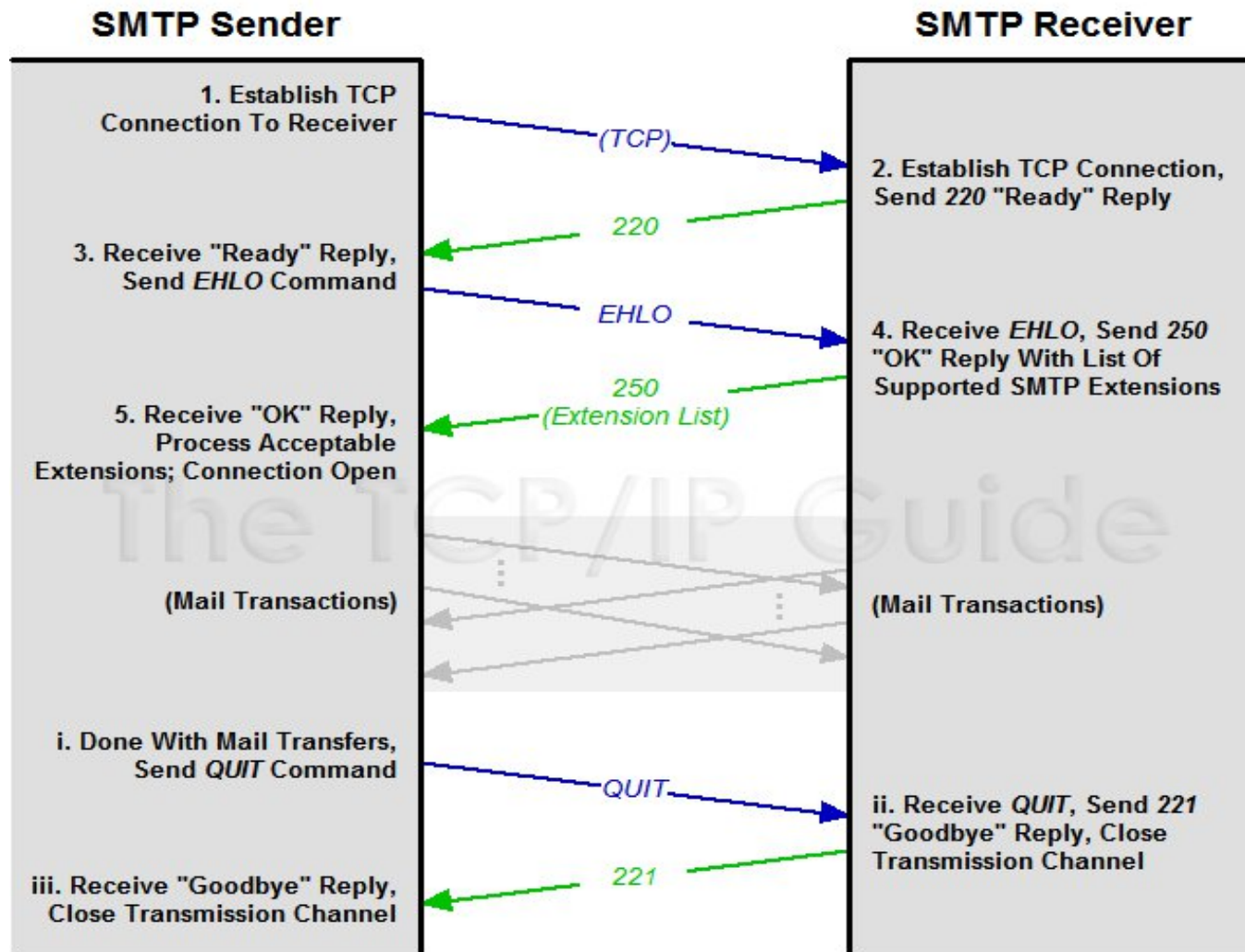
How SMTP works?



Commands of SMTP

| | |
|------------------|---|
| HELO | : Request to initiate SMTP session |
| MAIL FROM | : Sender's E-Mail address |
| RCPT TO | : Receiver's E-Mail address |
| DATA | : Body of message |
| QUIT | : Terminates SMTP connection |
| RSET | : Aborts mail transaction |
| VRFY | : Asks receiver to verify the validity of the mailbox |
| EXPN | : Asks receiver to identify mailing list |
| HELP | : Causes receiver to send help information |
| NOOP | : Forces server to verify the communication with SMTP receiver |

Session Establishment and Termination



SMTP Mail Transaction Process

1. Transaction Initiation and Sender Identification

S: HELO sjsu.edu

R: 250 Hello sjsu.edu

S: MAIL FROM:<cooldd10@yahoo.com>

R: 250 Ok

2. Recipient Identification

S: RCPT TO:<jainip_1983@gmail.com>

R: 250 Ok

3. Mail Transfer

S: DATA

R: 354 End data with <CR><LF>.<CR><LF>

S: <The message data>

S:.

R: 250 Ok, message accepted for delivery: queued as 12345

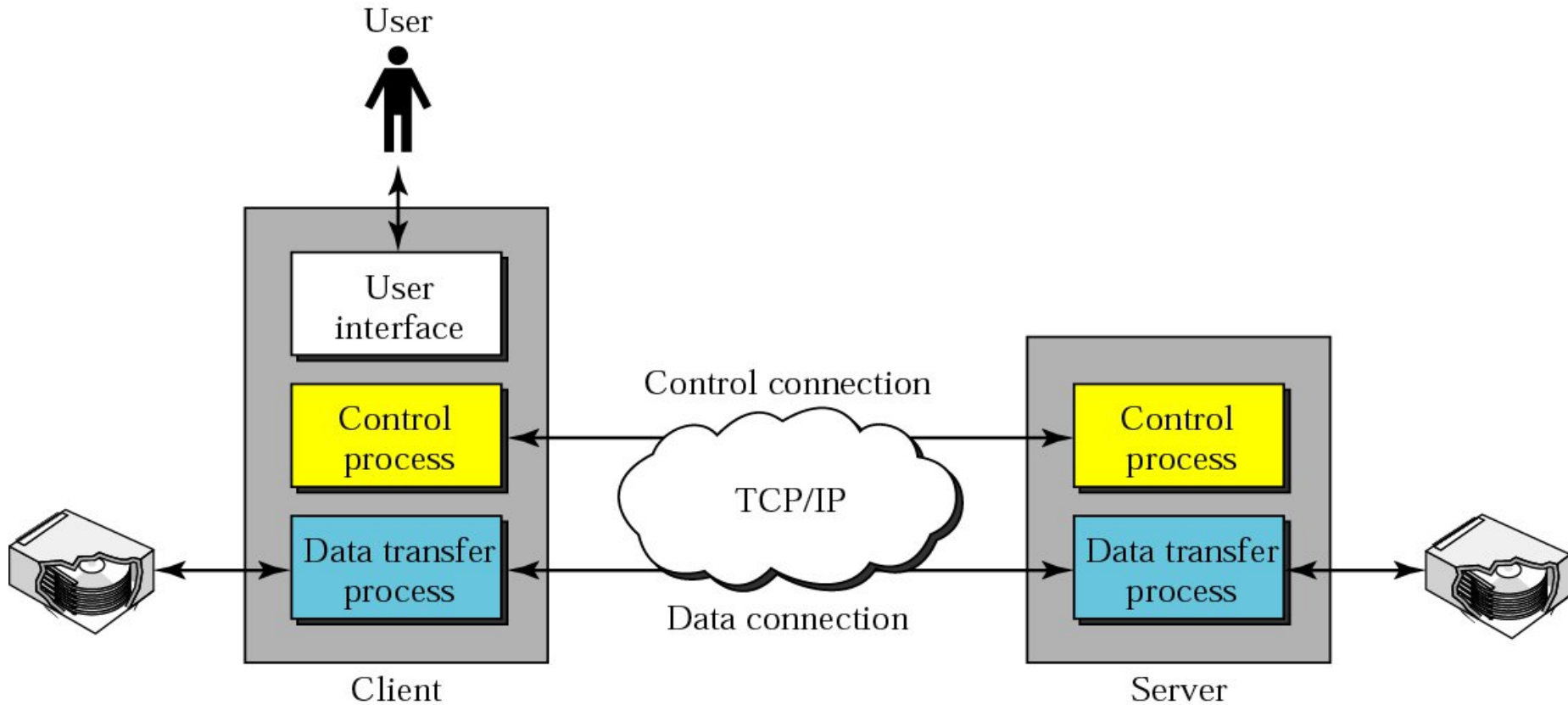
S: QUIT

R: 221 Bye

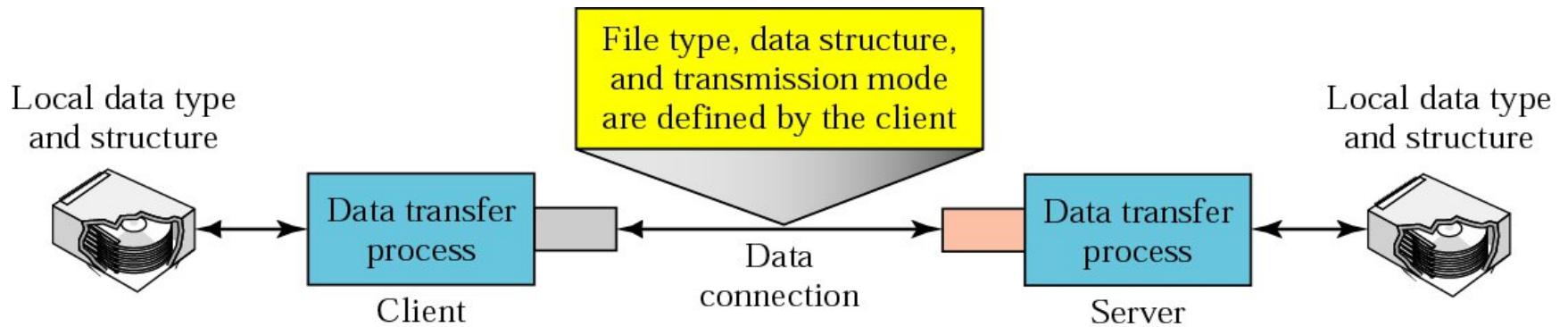
File Transfer Protocol

- File Transfer Protocol (FTP) is the standard mechanism provided by TCP/IP for copying a file from one host to another.
- FTP uses the services of TCP. It needs two TCP connections.
- The well-known port 21 is used for the control connection and the well-known port 20 for the data connection
- Establishes two connections
 1. Data Transfer
 2. Control Information Transfer

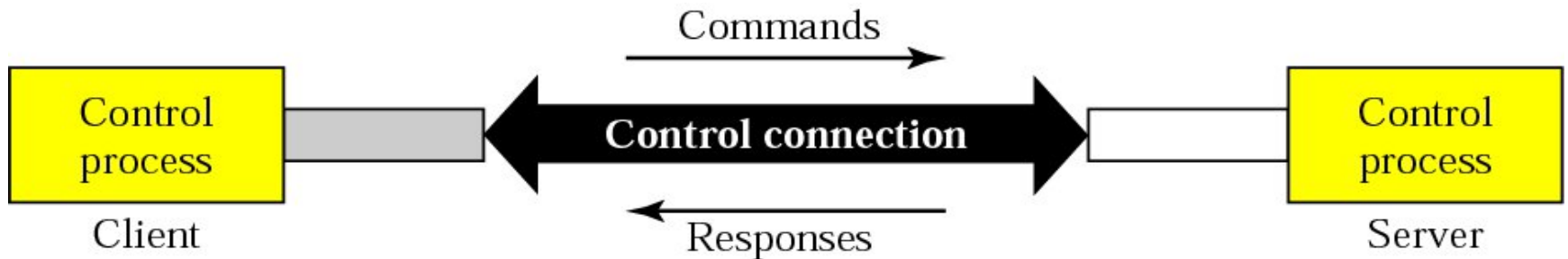
FTP Model

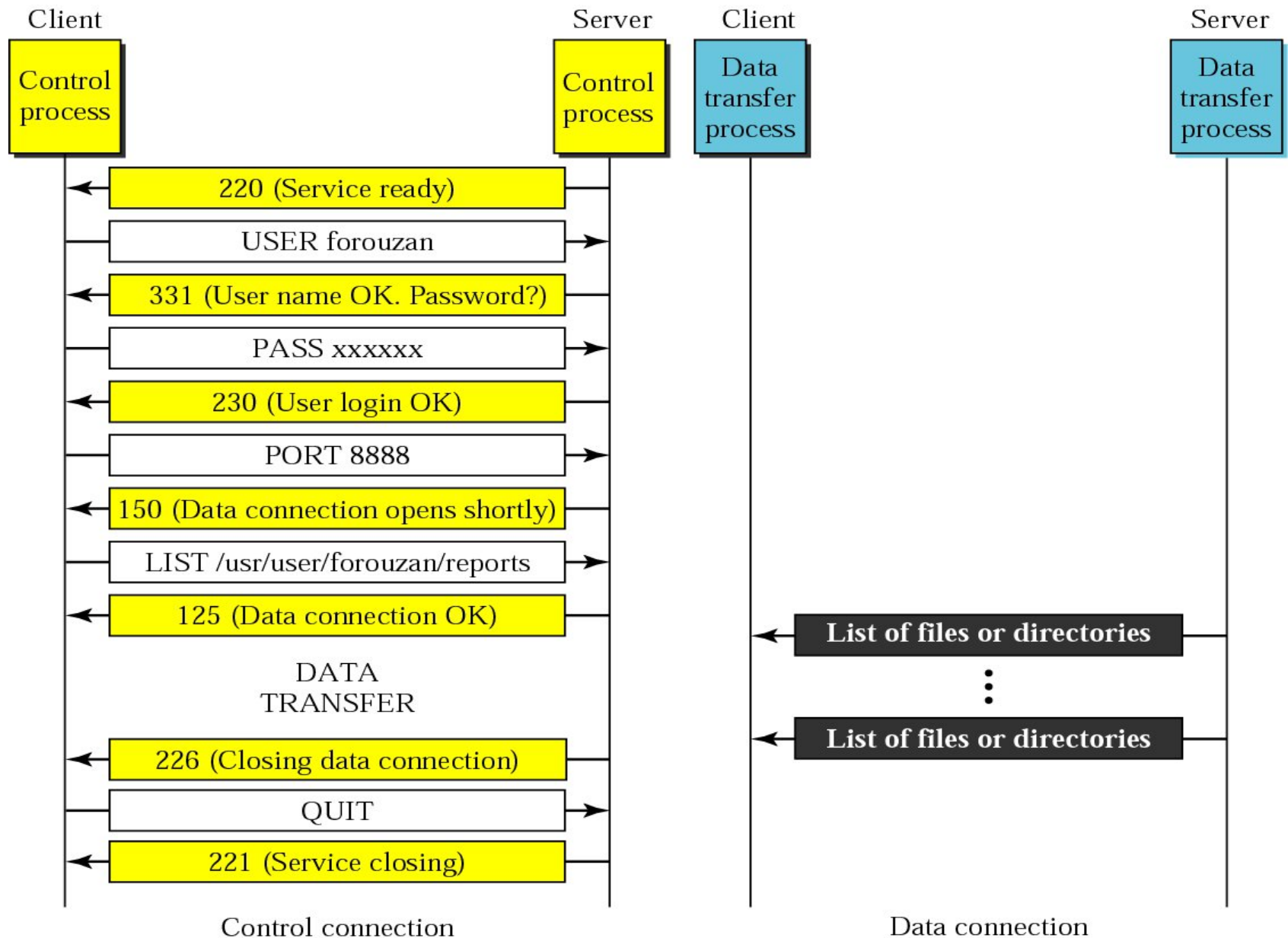


Using the data connection



Command processing





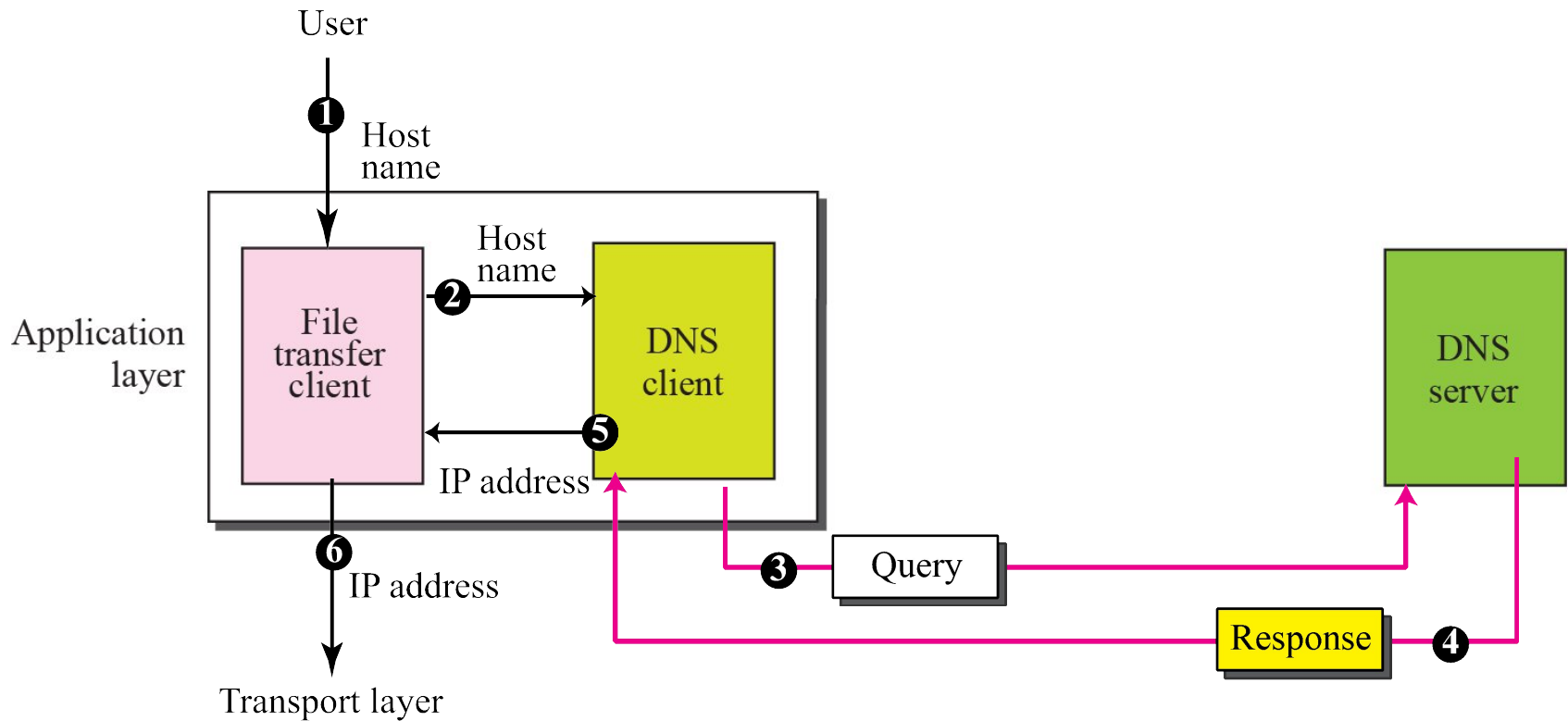
Domain Name Server (DNS)

- NEED FOR DNS

To identify an entity, TCP/IP protocols use the IP address, which uniquely identifies the connection of a host to the Internet. However, people prefer to use names instead of numeric addresses. Therefore, we need a system that can map a name to an address or an address to a name.

- The names must be unique because the addresses are unique

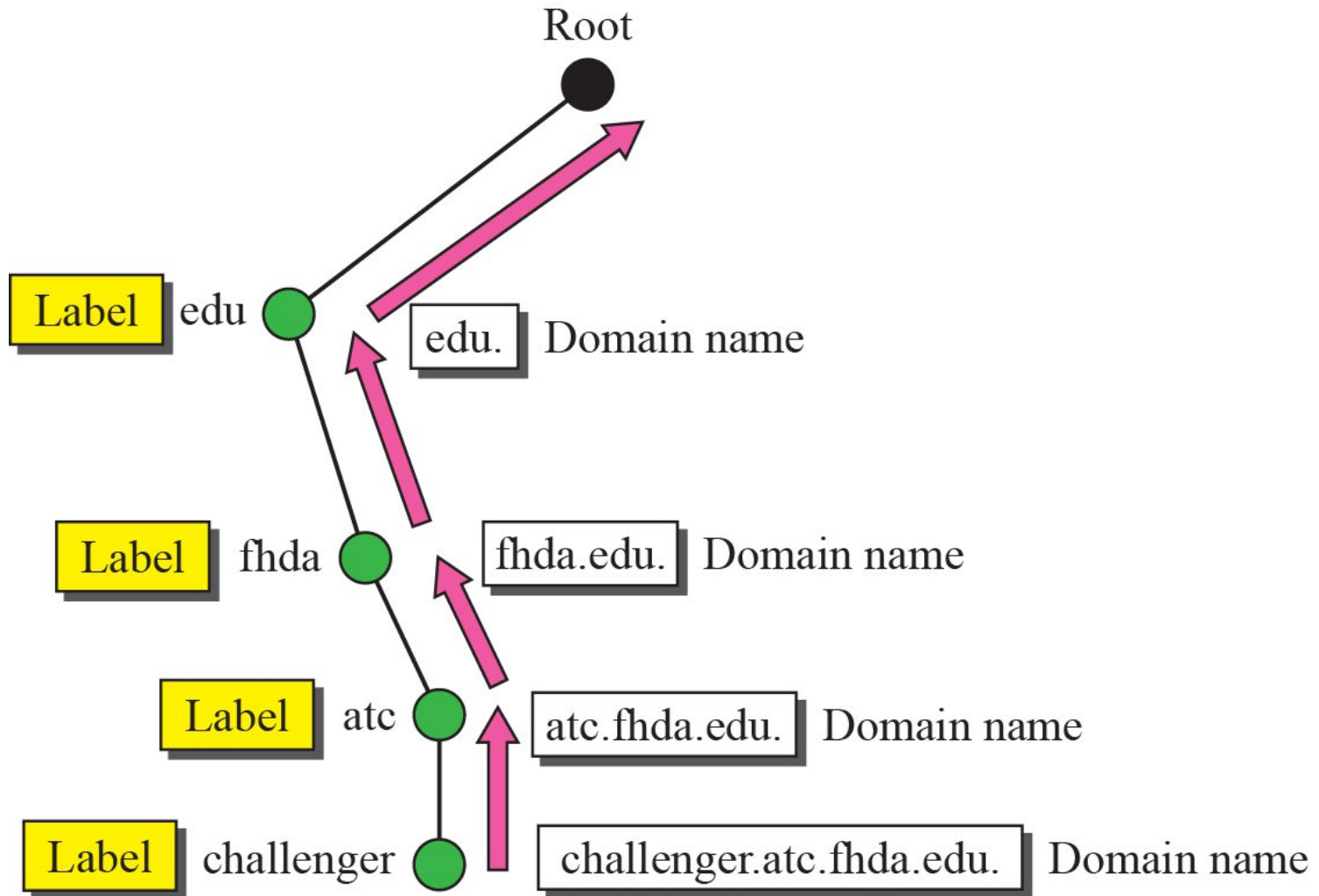
Figure 19.1 *Purpose of DNS*



NAME SPACE

- **Flat Name Space**
 - Series of characters without any structure.
 - Cannot be used for large systems like internet.
- **Hierarchical Name Space**
 - First part defines nature of organization
 - Second part defines name of organization
 - Third part defines department of organization and so on.

Domain names and labels



DNS IN THE INTERNET

- DNS is a protocol that can be used in different platforms. In the Internet, the domain name space (tree) is divided into three different sections:
 1. Generic domains
 2. Country domains
 3. Inverse domain

Generic domains

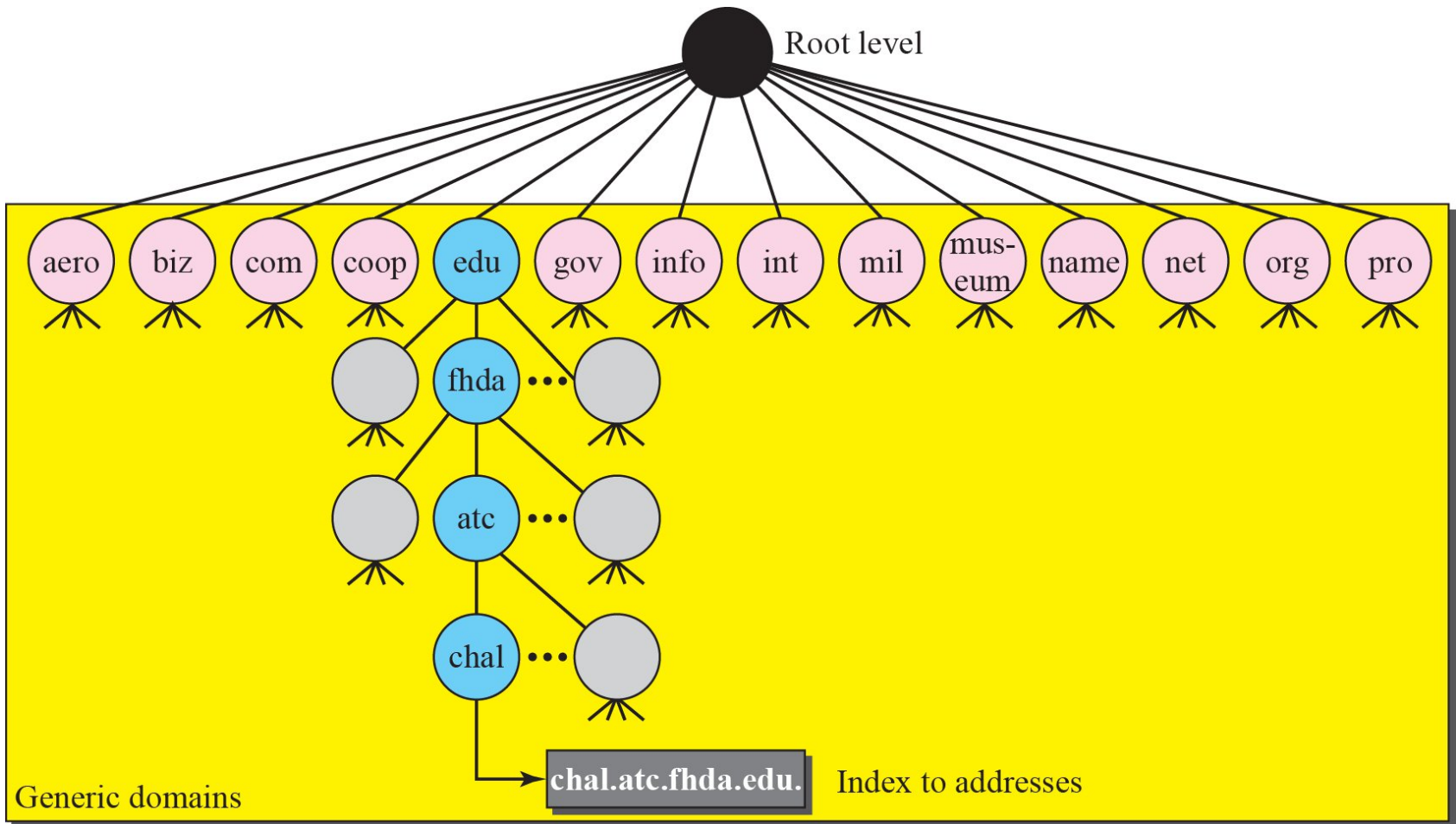
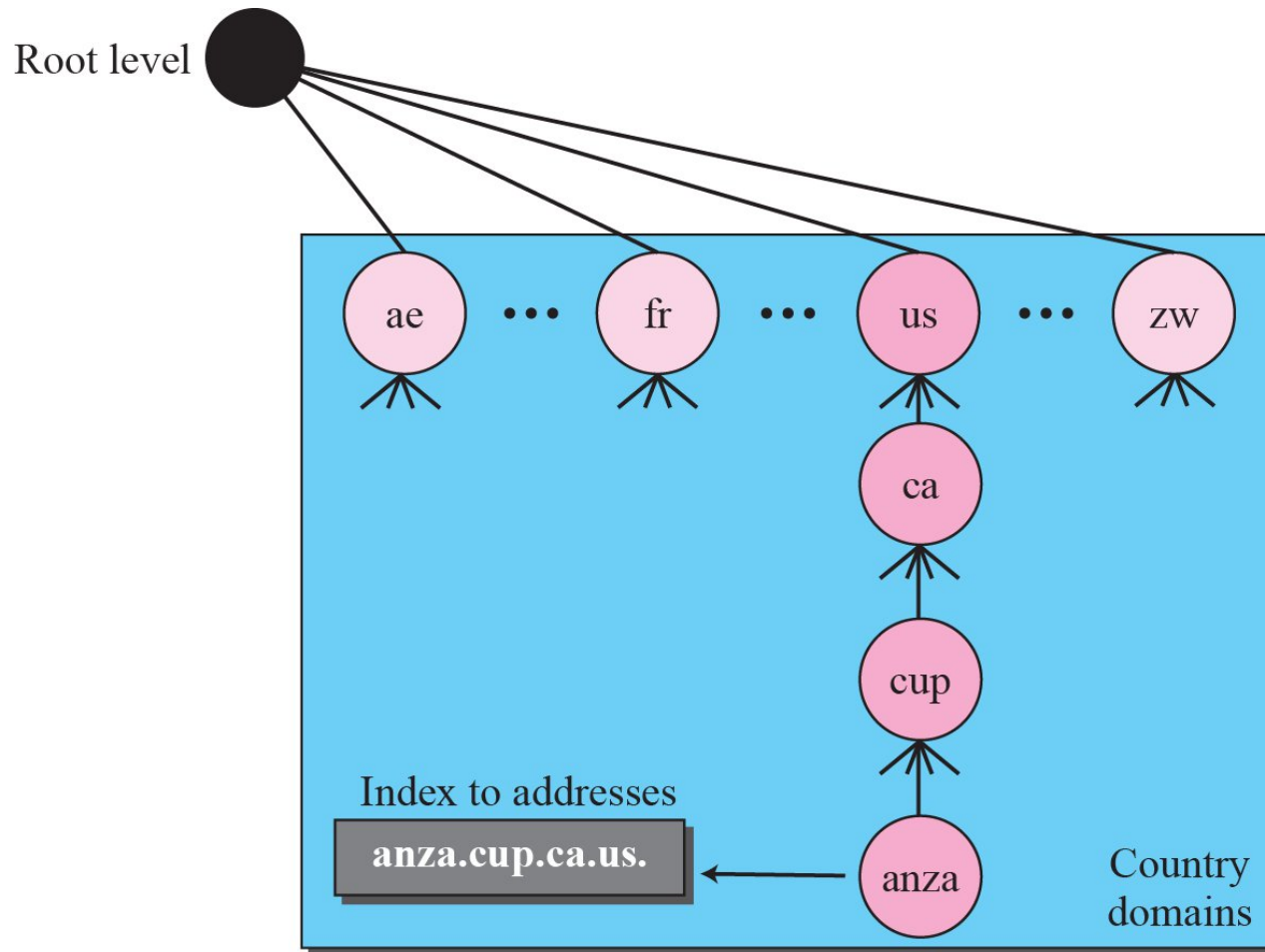


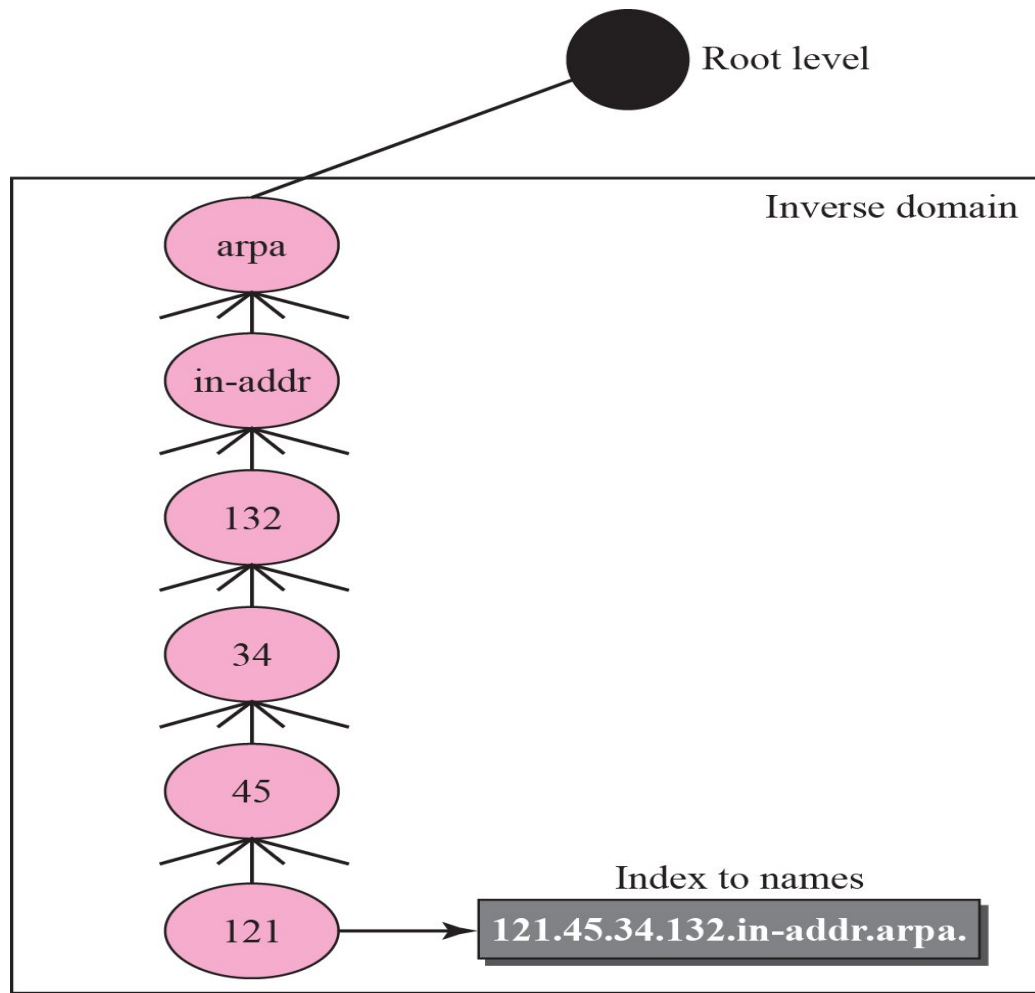
Table 19.1 *Generic domain labels*

| <i>Label</i> | <i>Description</i> |
|---------------|--|
| aero | Airlines and aerospace companies |
| biz | Businesses or firms (similar to “com”) |
| com | Commercial organizations |
| coop | Cooperative business organizations |
| edu | Educational institutions |
| gov | Government institutions |
| info | Information service providers |
| int | International organizations |
| mil | Military groups |
| museum | Museums and other non-profit organizations |
| name | Personal names (individuals) |
| net | Network support centers |
| org | Nonprofit organizations |
| pro | Professional individual organizations |

Country domains



Inverse domain



DNS Messages

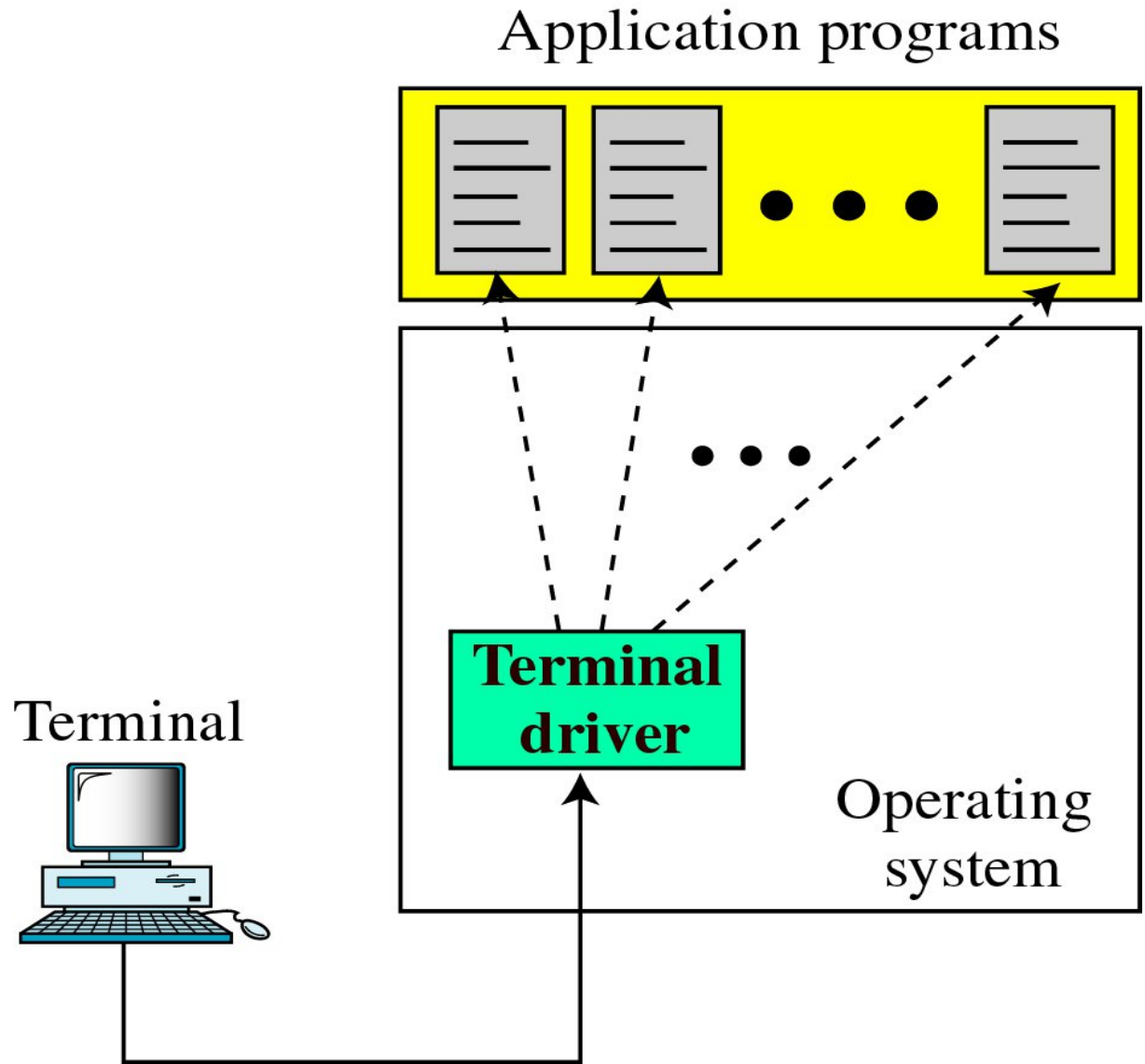
- Query Messages
- Response Messages

TELNET

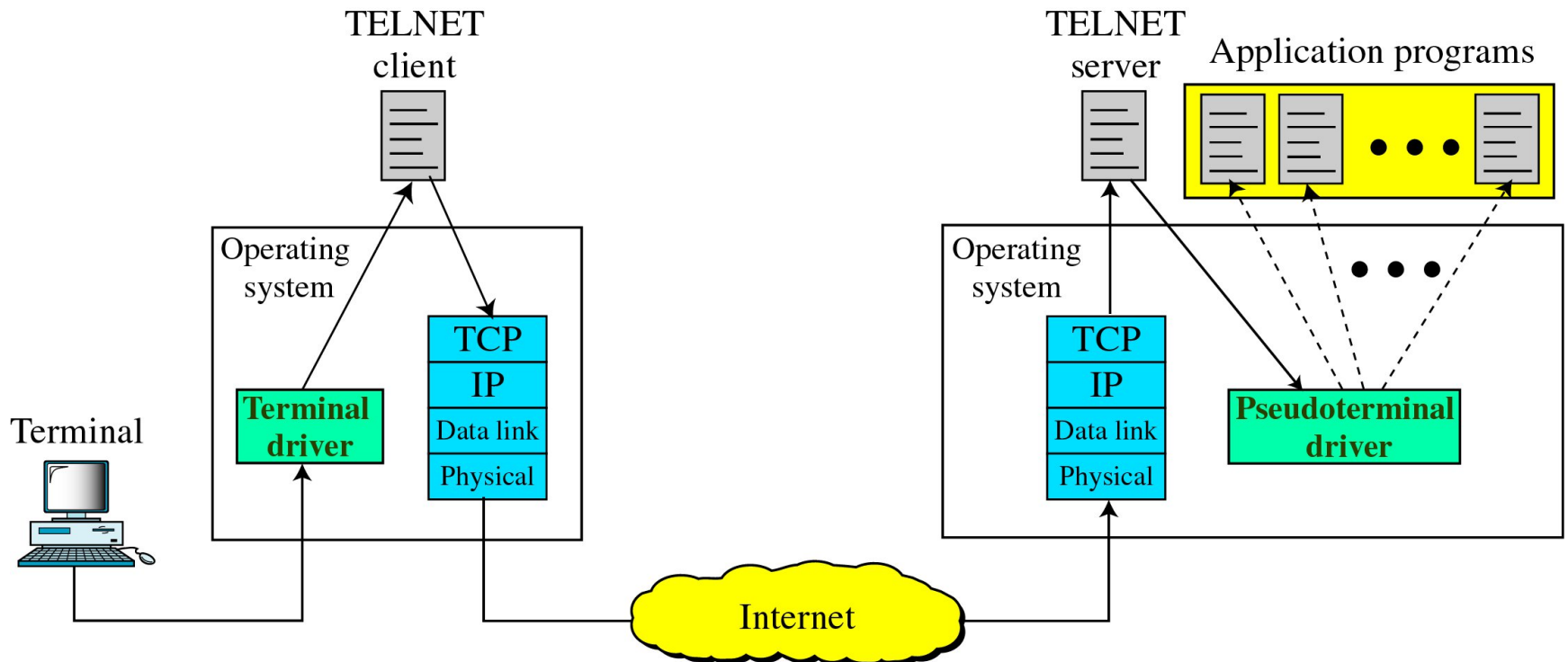
- TELNET is standard TCP/IP protocol that lets user access any application program on remote computer.
- TELNET – Terminal Network
- Standard protocol for virtual terminal service proposed by ISO.
- TELNET enables establishment of connection to remote system such that local terminal appears to be terminal at remote system.
- TELNET is a general-purpose client-server application program

TELNET

1. Local Login



2.Remote Login



Concept of NVT

