CHAPTER 26

Remote Log-in, Electronic Mail and File Transfer

Solutions to Review Questions and Exercises

Review Questions

1. In ***local log-in***, the user terminal is directly connected to the target computer; in ***remote log-in***, the user computer is connected to the target computer through the Internet.
2. The **leftmost bit** of a data character is **0**; the **leftmost bit** of a control character is **1**.
3. Options in TELNET are negotiated using four control characters **WILL**, **WONT**, **DO**, and **DONT**.
4. The addressing system has a ***local part*** and a ***domain name*** separated by the **@** symbol. The local part is a file that holds the mail. The domain name refers to a host that receives and sends mail.
5. A ***user agent (UA)*** is a software package that composes, reads, replies to, and forwards messages.
6. ***Multipurpose Internet Mail Extension (MIME)*** is a supplementary protocol that allows non-ASCII data to be sent through SMTP.
7. SMTP is a ***push*** protocol; it pushes the message from the client to the server. In other words, the direction of the bulk data (messages) is from the client to the server. On the other hand, retrieving messages from mail boxes needs a ***pull*** protocol; the client must pull messages from the server. The direction of the bulk data is from the server to the client. The third stage uses a message access agent (MAA) such as POP3 or IMAP4.
8. ***FTP*** copies a file from one host to another.
9. One connection is for ***data transfer***, the other connection is for ***control information***.
10. ***ASCII files***, ***EBCDIC files***, and ***image files***.
11. The three transmission modes in FTP are ***stream***, ***block***, and ***compressed***.
12. ***Storing a file*** means copying a file from the client to the server. ***Retrieving a file*** means copying a file from the server to the client.

13. ***Anonymous FTP*** allows a user to access files without an account or password on a remote server.

Exercises

14. The pattern is:

    11110011 00111100 11111111 11111111

    Note: The last byte is duplicated because it is the same as IAC; it must be repeated to be interpreted as data.

15. There are **15** characters in the command (including the end of line). Each character is sent separately to the server and each is echoed and acknowledged by the server. Each echo from the server is then acknowledged by the client. A total of **45** packets must be sent.

16. To do the task in Exercise 1, we need to send:

    Client to Server: **IAC DO BINARY** (3 bytes)
    Server to Client: **IAC WILL BINARY** (3 bytes)
    Client to Server: **11110011 00111100 11111111 11111111** (4 bytes)

    If each transmission is encapsulated in a single TCP segment with 20 bytes of header, there will be 3 segments of 23, 23, and 24 bytes for the total of **70 bytes** or **560 bits**.

17. Three transmissions, each with a minimum size of 72 bytes, mean a total of **216 bytes** or **1728 bits**.

18. If we assume the useful bits are the 3 bytes of data from Exercise 1:

    3 bytes of data / 216 bytes transmitted = **1:70**

19.
    a. **IAC WILL ECHO**
    b. **IAC DONT ECHO**
    c. **IAC IP** (Interrupt Process)
    d. **IAC GA** (Go Ahead)

20.
    MIME-version: 1.1
    Content-Type: Text/Plain
    Content-Transfer-Encoding: 7bit

21.
    MIME-version: 1.1
    Content-Type: Image/JPEG; name=”something.jpg”
    Content-Transfer-Encoding: base64

22. ***Connection establishment*** is needed for mail transfer because the messages sent relay necessary information about the communication to the client and server software, not just whether the computers have a connection via TCP.

23. There should be limitations on ***anonymous FTP*** because it is unwise to grant the public complete access to a system. If the commands that an anonymous user could use were not limited, that user could do great damage to the file system (e.g., erase it completely).
24. ***FTP*** does not need a message format because there is no need to send additional information back and forth aside from the ***commands*** and ***responses***, which use the control connection.