# Chapter 6

1．The maximum payload of a TCP segment is 65495 bytes. Why was such a strange number chosen?

TCP头至少有20个字节，而整个TCP报文段必须适配IP分组65515字节的荷载段，所以TCP数据段有65496个字节

2．If the TCP round-trip time RTT is currently 30 msec and the following acknowledgements come in after 26, 32 and 24 msec, respectively, what is the new RTT estimate using the Jacobson algorithm? Use a = 0.9.

RTT = a \* RTT + (1-a)\*M

RTT = 0.9 \* 30 + 0.1 \* 26 = 29.6

RTT = 0.9 \* 29.6 + 0.1 \* 32 = 29.84

RTT = 0.9 \* 29.84 + 0.1 \* 24 = 29.256

3．In a network that has a maximum TPDU size of 128 bytes, a maximum TPDU lifetime of 30 sec, and an 8-bit sequence number, what is the maximum data rate per connection?

30s内发送方发送的TPDU的数目不能多于255，最大速率为255 \* 128 \* 8/30 = 8738b/s。

4．To get around the problem of sequence number wrapping around while old packets still exist, one could use 64-bit sequence number. However, theoretically, an optical fiber can run at 75 Tbps. What maximum packet lifetime is required to make sure that future 75 Tbps networks do not have wraparound problems even with 64-bit sequence numbers? Assume that each byte has its own sequence number, as TCP does.

顺序号的总个数是2 ^ 64 个字节，约为2 \* 10^89个字节，发送器每秒消耗顺序号个数为75/8 = 9.375 \* 10^12，所以顺序号循环一周期要2\*10^6s，约为23天。最长生命周期23天。

# Chapter 7

1. Can a machine with a single DNS name have multiple IP addresses? How could this occur?

可以。如果一台机器有两块以太网卡，它可以在两个相互独立的网络中，需要两个IP地址。

1. A binary file is 3072 bytes long. How long will it be if encoded using base64 encoding, with a CR+LF pair inserted after every 80 bytes sent and at the end?

base64编码先将消息分解成3个字节一组的1024个单元，再将每组编码为4个字节，一共4096个字节，把这些字节以80个一组分行，得到52行，再加上52个CR，52个LF一共4200个字节。

1. From an ISP's point of view, POP3 and IMAP differ in an important way. POP3 users generally empty their mailboxes every day. IMAP users keep their mail on the server indefinitely. Imagine that you were called in to advise an ISP on which protocol it should support. What considerations would you bring up?

存储用户邮件要占用磁盘空间。这会产生使用POP3的争论， ISP可以支付少量的磁盘存储费用，使邮件转变为收费。对IMAP的争论在于其鼓励用户把邮件保存在服务器并且为使用的磁盘存储支付费用。

1. The standard http URL assumes that the Web server is listening on port 80. However, it is possible for a Web server to listen to some other port. Devise a reasonable syntax for a URL accessing a file on a nonstandard port

http://dns-name:port/file

1. Imagine that someone in the CS Department at Stanford has just written a new program that he wants to distribute by FTP. He puts the program in the FTP directory ftp/pub/freebies/newprog.c. What is the URL for this program likely to be?

ftp/pub/freebies/newprog.c

如果FTP使用SMB协议，则ftp://pub/freebies/newprog.c:(Port)