Mac Sublayer

1. A group of N stations share a 56-kbps pure ALOHA channel. Each station outputs a 1000-bit frame on average once every 100 sec, even if the previous one has not yet been sent (e.g. the stations can buffer outgoing frames). What is the maximum value of N?

For a 56-kbps pure ALOHA channel, its available data rate is 0.184 × 56kbps = 10304 bps. Because each station outputs a 1000-bit frame on average once every 100 sec, the data rate of each station is 1000/100 = 10 bps. So the maximum number of stations will be 10304/10 ≈1030.

1. What is the baud rate of the standard 10-Mbps Ethernet?

以太网使用曼彻斯特编码，这就意味着发送的每一位都有两个信号周期。标准以太网的数据率为10Mb/s，因此波特率是数据率的两倍，即20MBaud。

1. Consider building a CSMA/CD network running at 100 Mbps over a 1-km cable with no repeaters. The signal speed in the cable is 200,000 km/sec, what is the minimum frame size?

对于1-km 电缆，单程传播时间为1/200000 =5×10−6 s，即5μsec，来回路程传播时间为10 μsec。为了能够按照CSMA/CD 工作，最小帧的发射时间不能小于10 μsec。以100 Mbps数率计算，最小帧的大小为：10×10−6 × 100 × 106 = 1000 bits。

1. The reason for binary exponential backoff in the classical Ethernet is that this algorithm is adaptive to network load.
2. When binary exponential backoff is used, a random number between 0 and 1023 is chosen and that number of slots is skipped.
3. A network interface card mainly works at the physical and data link layers.
4. Which is not the one of important functions provided by bridges?
5. Reducing the collision domain
6. Increasing the data rate
7. Increasing the length of domain
8. Reducing the broadcast domain √
9. There is a 10 Mbps Ethernet switch with 10 ports each of which is connected to a single computer. Then every computer’s data rate is 10 Mbps.
10. Work at the physical layer while work at the data link layer.
11. Hubs, routers
12. Hubs, switches √
13. Bridges, routers
14. Repeaters, hubs
15. What kind of media used by 1000base-F network?

Fiber optics.