

1. When packet size is not fixed, WiFi is considered not fair, i.e., stations receive very different throughput. Why? Briefly justify.

For WiFi, each station can only transmit one packet/frame once obtaining the channel access. However, WiFi is roughly fair with the random backoff. So, the chance of obtaining the channel access is similar for different stations. Therefore, a station sending 1024 Bytes frames will receive much larger throughput than another one sending 100 Bytes frames.

2. When sending small data packets, such as in voice calls, WiFi achieves low utilization. Why? Briefly justify.

RTS/CTS/ACK, together with several DIFS/SIFS and time wasted for performing backoff, create significant overhead when transmitting data packets. If the data packet size is small, then the network utilization will be small since only very small amount of time is actually used to transmit data packets.