Wireless Network.
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Compare the performance of PCF and DCF
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First let's just note that both DCF and PCF are 802.11 medium access types. DCF stands for Distributed Coordination Function and PCF stands for Point Coordination Function. During this lab we will study the difference using PCF or DCF.

Exercises :

1. <u>Analyse of graph 1 :</u> We can see that the fact that we are using PCF or DCF is not changing anything when it's about the load. We can't see a real difference between the two results.
   <u>Analyse of graphe 2 :</u> This time we can see that there is a difference using PCF or DCF. Indeed, when you're using DCF you gonna have a lot more of retransmissions than when you're using PCF.

   We know that retransmission attempts can occured in the network when packets are lost or damage during the transmission. Here, figure 2 shows that retransmission attemps are less important in a wireless network when we use PCF.
   We can explain this because PCF reduces the number of collisions by taking advantage of contention free periods and then reduces retransmissions.

2. By studying the third graph we can see that when a workstation is using DCF the WLAN delay is really not constant at all, and also the average delay is higher than a workstation using PCF.
   When a workstation is using PCF, the delay is not as important as a worksation using DCF, but also the average delay is exactly the same than the WLAN delay. So the delay is quite constant.

   The explanation for the delay could be that there is a lot of attempts for retransmissions for the workstation using DCF. It could indeed increase the delay. We could also explain that by the fact that DCF is not "studying" the channels to know if it can use them or not, so channels could be busy while using them and then you could have some delay, while when you're using PCF you will use the channel when it is supposed to be a "good time".
   The fact that the delay is constant for the workstation using PCF can be a good

thing because it makes the transmission more reliable. It is faster and more reliable. It makes it more interesting if you want to do some real time applications.

3. We know that DCF is a distributed algorithm so all the stations equally participate in taking the needful decisions in regards to exploring the possibility of alternate available paths. On another hand, in PCF coordination is achieved by a single centralized access point running a centralized algorithm.
Knowing all of that we should be able to conclude that PCF should reduce overall throughput.
But here, the graph shows that throughput are quite the same. We could explain that because the load is not big enough to see a difference for the throughput. If we had a bigger load we should see that PCF will reduce the throughput eventually.
It could aslo be because there is not a lot of workstations. Therefore the fact that DCF is based on a distributed algorithm is not and a big advantage anymore in term of throughput.

4. Using PCF will reduce the delay, it will also reduce the attempts of retransmissions, but it could also reduce the throughput if you have a big load. Therefore if you have a real time application you should use PCF.
But if you are sending big packets and you want it to be fast you should use DCF.