Network measurement laboratory

Examples of oral questions to be discussed with students

1) Can you explain what happens when two hosts, H1 and H2, are connected to the same LAN, and H1 pings H2? Show me the sequence of packets, and update the ARP tables of H1 and H2 if they change.

2) As above, but some there is a third host H3. What happens to its ARP tables in the same scenario?

3) Discuss what happens in a LAN when there are two hosts with duplicate IP addresses. Can they communicate each other? Can they communicate to a third host?

4) Assume two hosts are connected to the same switch with 10Base-T links, in Full Duplex mode. What could be the maximum goodput an application could achieve in this scenario?

5) As above, but what if one of the links is in Half Duplex? Can there be any collision? Can you predict the collision probability?

6) As above, but using WiFi links. What is the maximum goodput in a WiFi LAN when two hosts exchange data at the application layer?

7) Show and discuss a possible LAN setup in which it would be possible to I) create collisions, ii) suffer from packet drops, and iii) create congestion situations when hosts exchange some traffic.

8) Consider an intruder is trying to verify which services are running on your system using a tool like nmap. Explain what would be the strategy to check which services are available over TCP, and over UDP. How much time would he/she spend to complete the scan? Why with UDP it takes so much more?

9) Consider a trace collected on backbone links with Tstat. How can you compute statistics related to the traffic exchanged by each client? How to get the most popular server used by a service, e.g., youtube?

10) Compute the fraction of traffic due to HTTP and HTTPS on the 1 hour trace collected by Tstat over time. Aggregate data over 5 min time interval.

11) Discuss a possible monitoring solutions for a corporate network, and the privacy regulations and implications that the system must fulfil.