UDP Sockets Programming

Summary of what we learned

- AF_INET and PF_INET are the same for linux but are different for others.
- UDP is a datagram protocol so the type argument is SOCK_DGRAM when creating the socket instead of SOCK_STREAM for TCP.
- The socket address structure is used by the sendto and recvfrom UDP functions to hold the address and port of the relevant packet.
- UDP does not need to use listen, accept and close functions since it doesn't have to make a continuous connection. With the recvfrom function the main server socket lays in wait for whatever packet may come through the port. It doesn't make any child connection socket, so only one socket is needed.
- VLC sends the packets to and "listens" on whatever addresses and ports are specified.

Exercises

1) What was the effect of increasing the loss rate on the video quality?

The video stutters and jumps and becomes blocky. It stays on the last frame it received for longer periods of time, then the next frame it receives is one further along in the video, so it looks like it has skipped ahead.

2) To counter the effect of network loss, someone suggested using TCP instead of UDP for multimedia communication. Do you agree? Why? Why not? (Hint: Answer the question in terms of buffer space, jitter, and retransmission time.

UDP is better for multimedia communication. UDP doesn't need any buffer, while TCP does need it to store any out-of-order packets. With a long transmission and large packet loss that buffer may have to be very large. Depending on the loss rate the backoff and retransmission for TCP can be very long, so the video looks slow and laggy because it is trying to play every single frame. Since it's playing each frame the video might be a bit behind the actual current frame. With UDP the video jumps but is always at the most current frame. UDP video would look like the correct frame rate while TCP video would look slowed down or jittery. Communication probably needs the most recent frame more than needing all the frames to be watchable/understandable, unless the frames will be saved to view later.

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